United States
Environmental Protection
Agency

Health Effects Research
Laboratory
Research Triangle Park NC 27711

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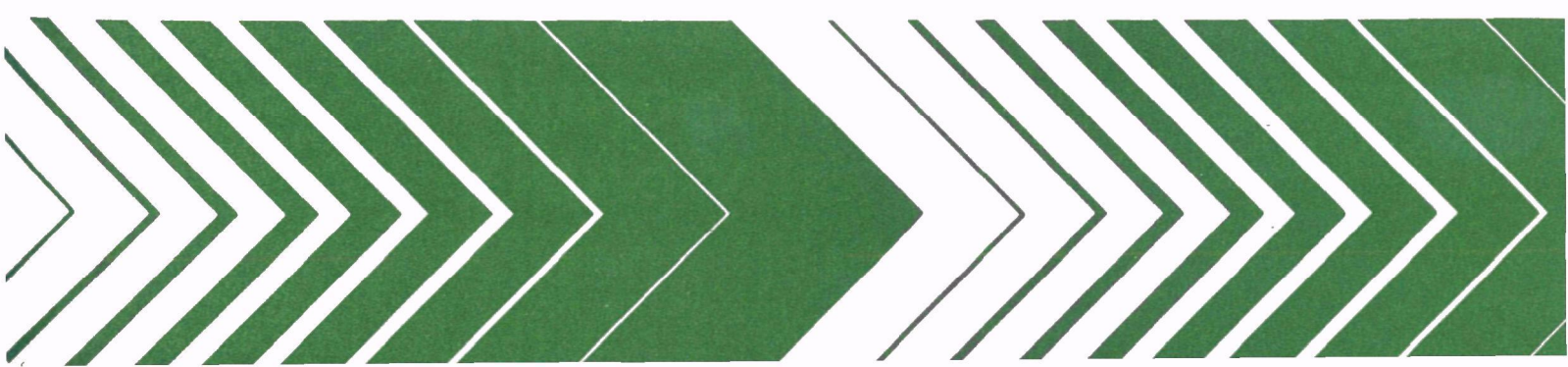
January 1979

Research and Development

EPA

Modeling of Simulated Photochemical Smog with Kinetic Mechanisms

Volume 2. Interim Report Appendix



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EPA-600/3-79-001b
January 1979

MODELING OF SIMULATED PHOTOCHEMICAL SMOG WITH KINETIC MECHANISMS

Volume 2. Interim Report Appendix

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OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27711

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ABSTRACT

Computer modeling of smog chamber data is discussed in three parts. First, a series of detailed chemical mechanisms were developed to describe the photochemical formation of ozone from nitrogen oxides and the following compounds (alone and in various combinations): formaldehyde, acetaldehyde, ethylene, propylene, butane, 1-butene, trans-2-butene, and 2,3-dimethylbutane. The aldehyde mechanisms were verified independently using data from experiments containing only nitrogen oxides and the appropriate aldehyde. The hydrocarbon mechanisms were then developed by adding the chemical reactions detailing the photooxidation steps of the particular hydrocarbon to the aldehyde mechanisms. Second, a generalized kinetic scheme intended for use in models simulating the formation of ozone in urban atmospheres was refined. The generalized mechanism includes a condensed version of the explicit mechanisms developed in the first part plus a semi-emipirical scheme to describe the oxidation of aromatic hydrocarbons. Third, the effects of smog chambers on ozone formation were examined. For this part of the study, similar experiments using propylene and nitrogen oxides in eight different smog chambers were simulated. The main chamber effects identified thus far are apparently due to nitrogen oxides degassing from the walls during experiments and differences between chambers in the spectral distribution of ultraviolet irradiation.

Volume 1 contains all textual material; this volume contains graphs of measured and simulated pollutant concentrations for many smog chamber experiments. The two-volume report was submitted to the U.S. Environmental Protection Agency in fulfillment of Contract No. 68-02-2428 by Systems Applications, Incorporated. This report covers the period 23 August 1976 to 23 August 1978, and work was completed as of 18 August 1978.

CONTENTS

ABBREVIATIONS

ALD2	Acetaldehyde
ALD3	Propionaldehyde
ALD4	Butyraldehyde
AONE	Acetone
ARO	Aromatics
BLA	Blacklamp irradiation
BUT	n-Butane
BUT1	1-Butene
BUT2	Trans-2-butene
CO	Carbon monoxide
C2N3	Ethyl nitrate
C4N3	n-Butyl nitrate
C6N3	2,3-Dimethylbutyl nitrate
DBUT	2,3-Dimethylbutane
EC	Evacuable chamber (at UCR)
ETH	Ethylene
FORM	Formaldehyde
HCHO	Formaldehyde
H2O2	Hydrogen peroxide
MEK	Methylethylketone
MEN3	Methyl nitrate
NO	Nitrogen oxide
NOX	Oxides of nitrogen ($NO + NO_2$)
NO2	Nitrogen dioxide
O3	Ozone
OLE	Olefins
PAN	Peroxyacetyl nitrate
PAR	Paraffins
PPN	Peroxypropionyl nitrate
PROP	Propylene
SCN3	Sec-butyl nitrate
SPN3	Isopropyl nitrate
SUN	Sunlamp irradiation
SUNLAMP	Sunlamp irradiation
UCR	University of California at Riverside
UNCB	University of North Carolina ("blue" side of chamber)
UNCR	University of North Carolina ("red" side of chamber)

APPENDIX

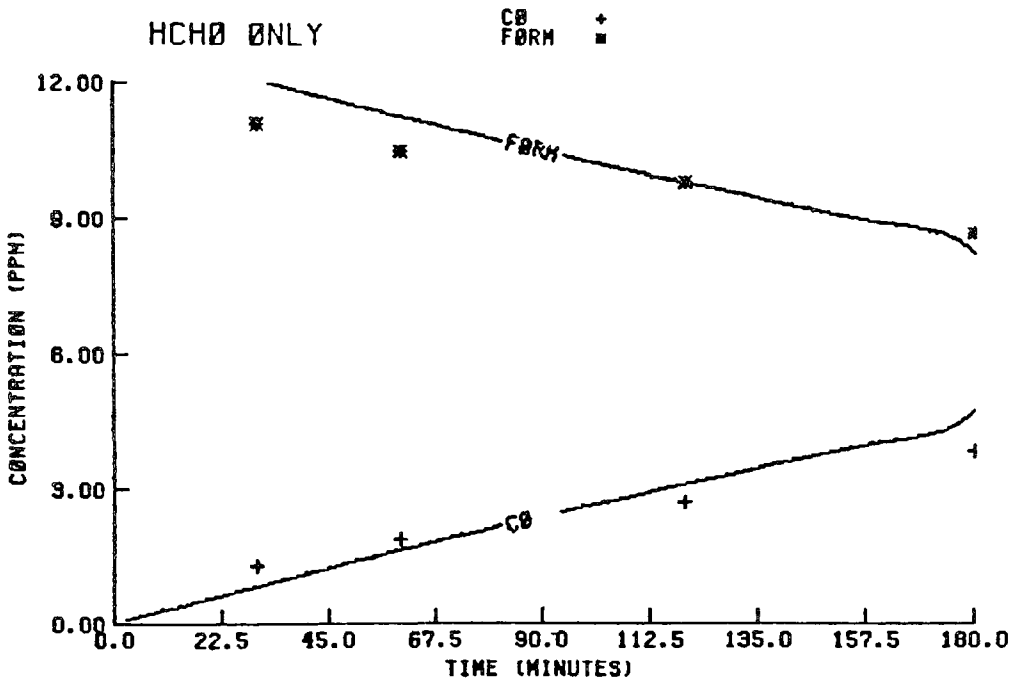
SIMULATION RESULTS

Volume I of this two-volume report discusses the results of this study. This volume (II) is the data volume: It presents graphs of simulated and measured pollutant concentrations in smog chamber experiments. In all figures, the symbols represent measured concentrations and the solid lines represent simulation concentrations. The pollutants are identified in the graphs by two- to four-space codes, which are given in the list of abbreviations. Simulations with explicit mechanisms (Part A) are presented first, followed by simulations with the Carbon-Bond Mechanism (Part B), and simulations with the explicit propylene mechanism in the study of chamber effects (Part C).

Part A

Simulation Results with Explicit Mechanisms

FORMALDEHYDE EXPERIMENTS BY BUFALINI, GAY, AND BRUBAKER (1972).
Simulated with explicit formaldehyde mechanism.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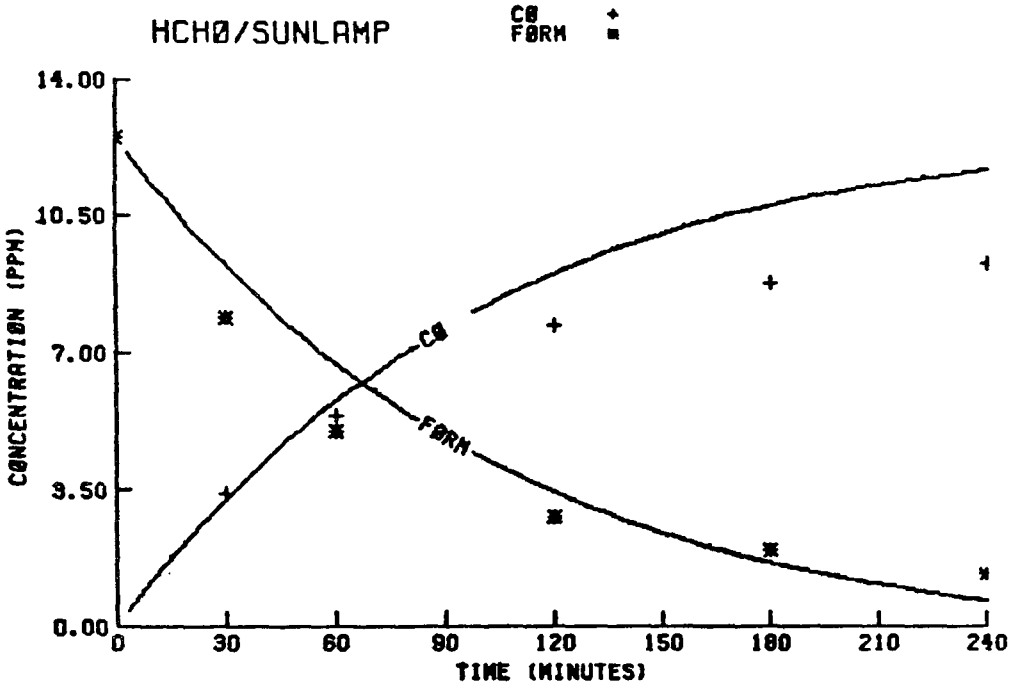
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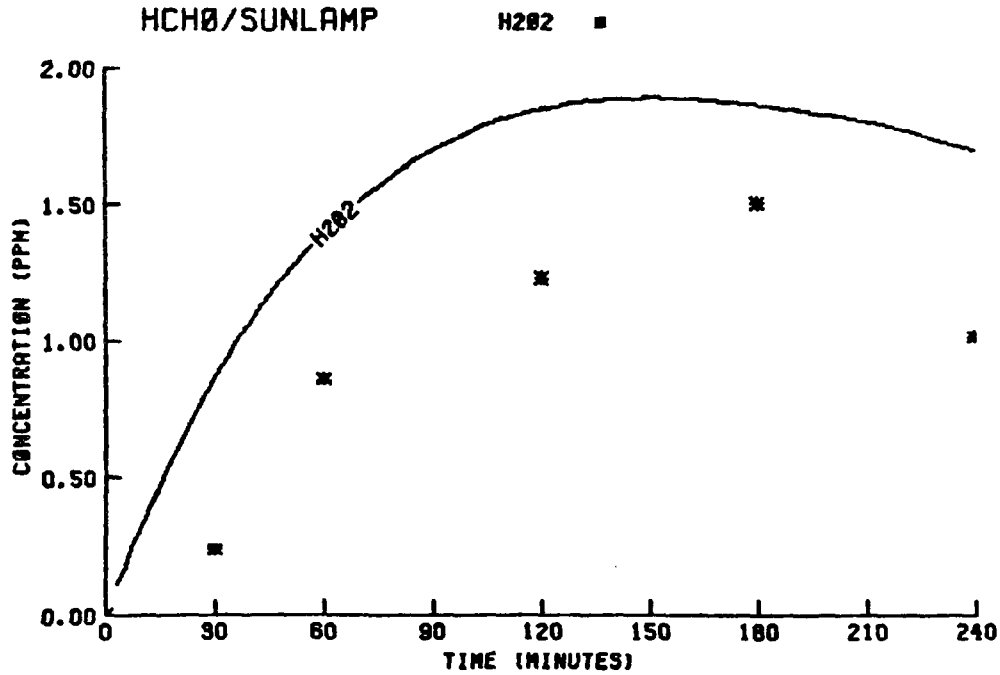
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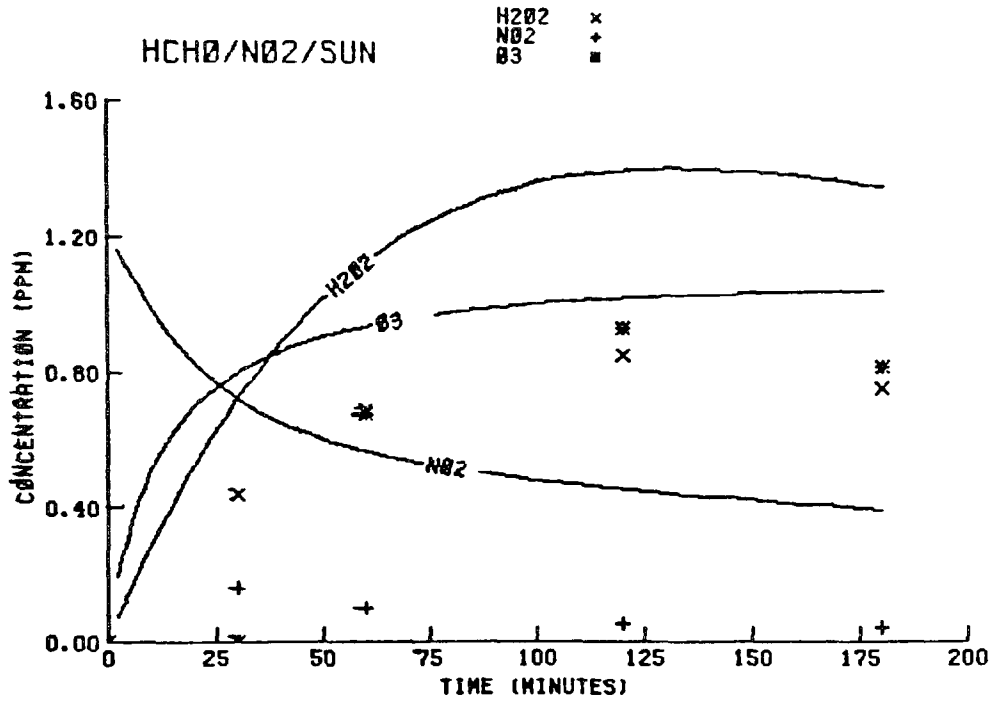
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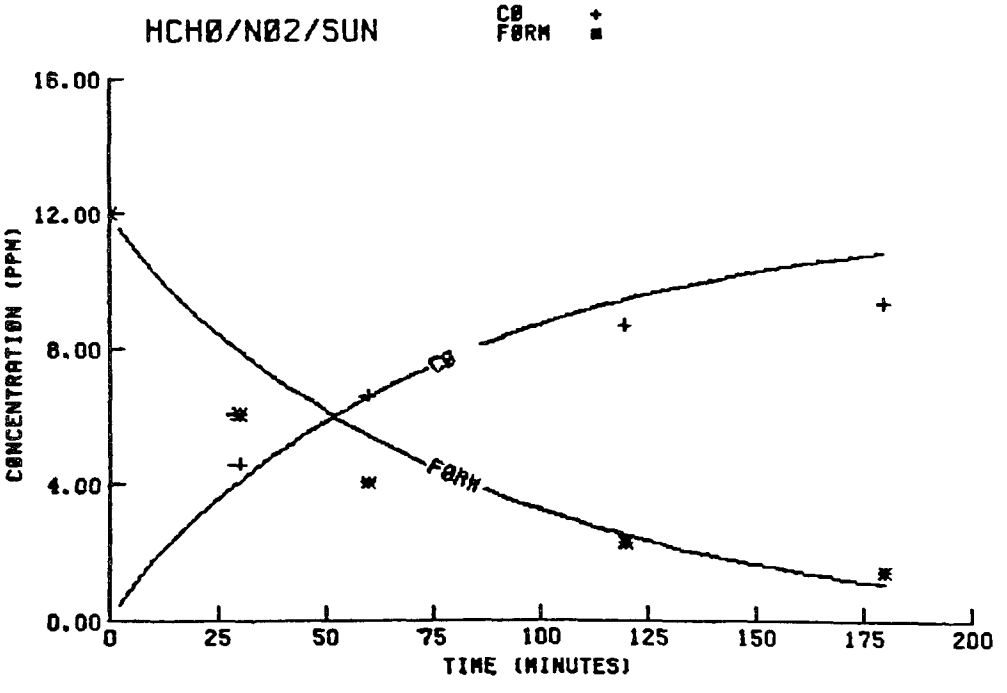
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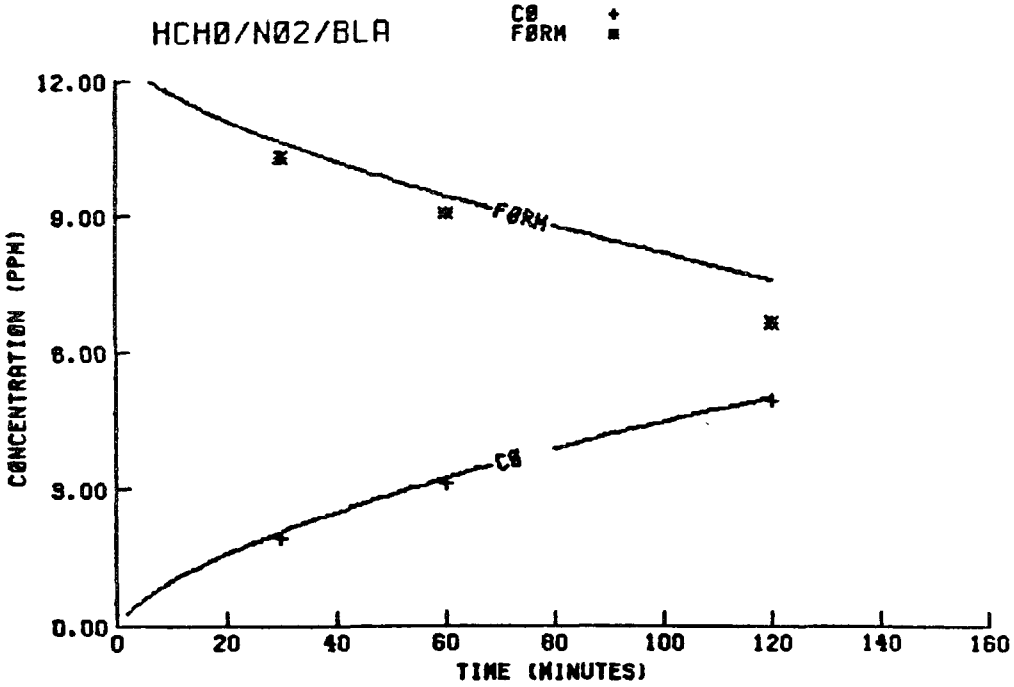
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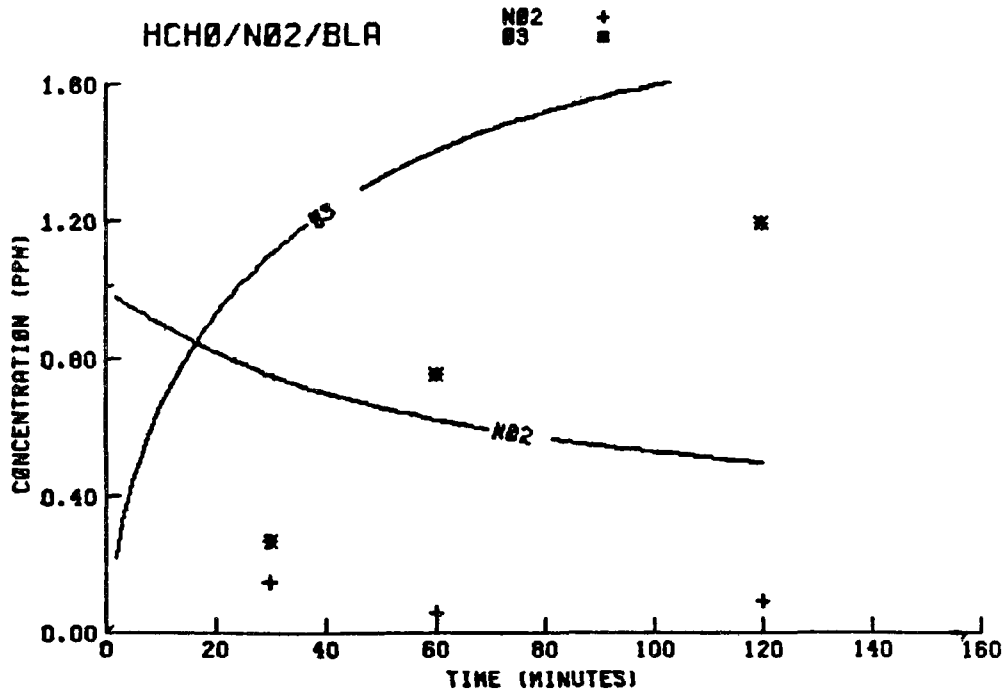
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100
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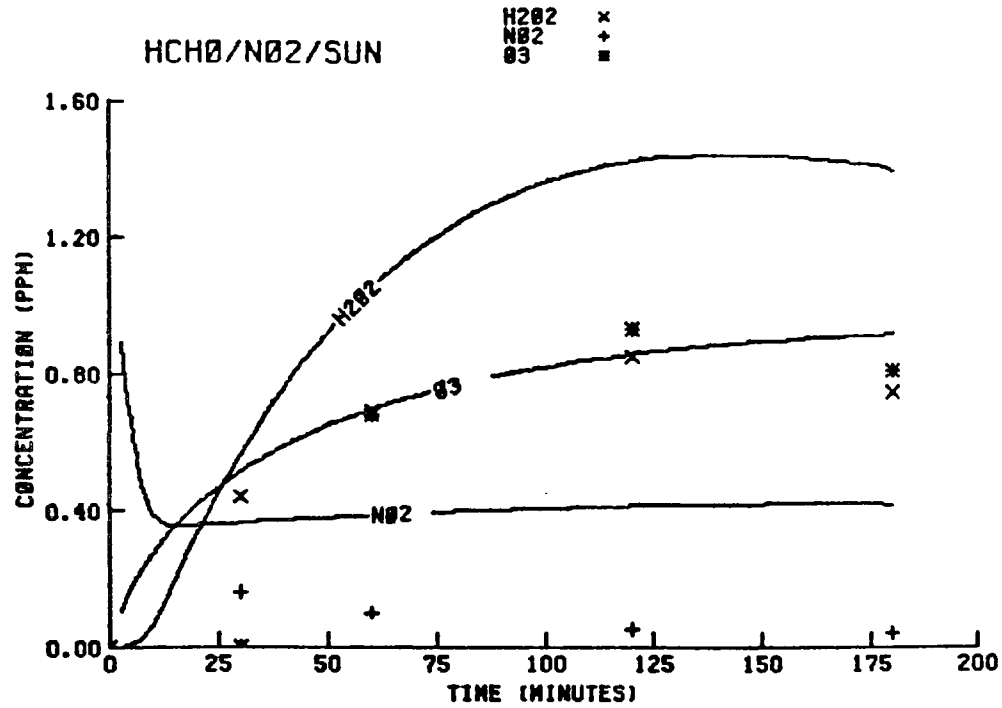
TIME (MINUTES)

EXPERIMENTS BY BUFALINI, GAY, AND BRUBAKER (1972).
Simulated with explicit formaldehyde mechanism with added reactions for peroxynitric acid ($HOONO_2$).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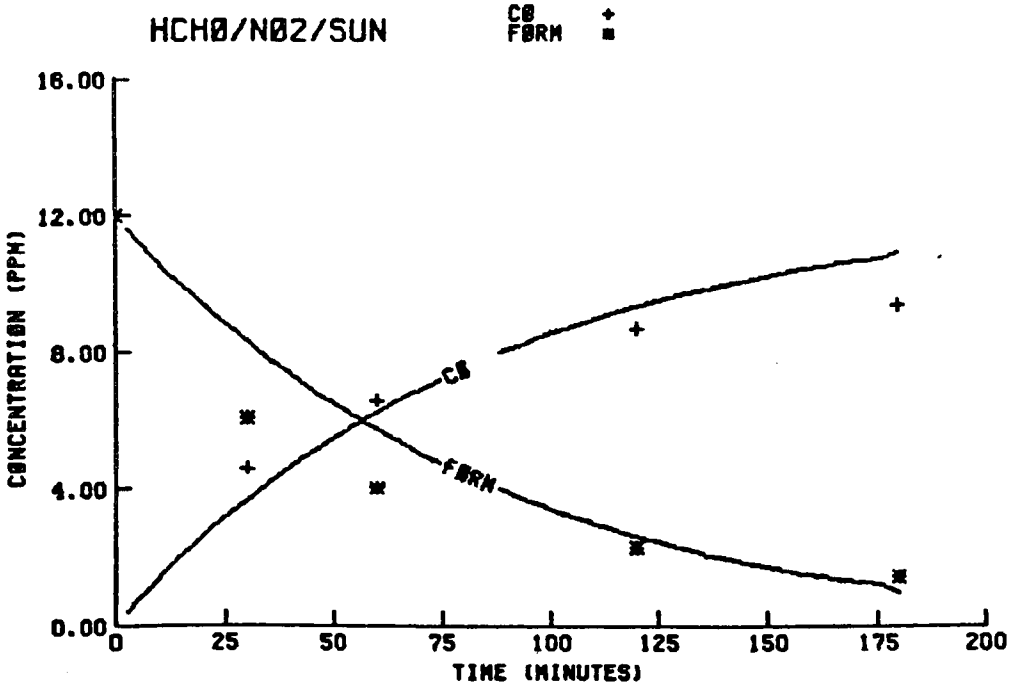
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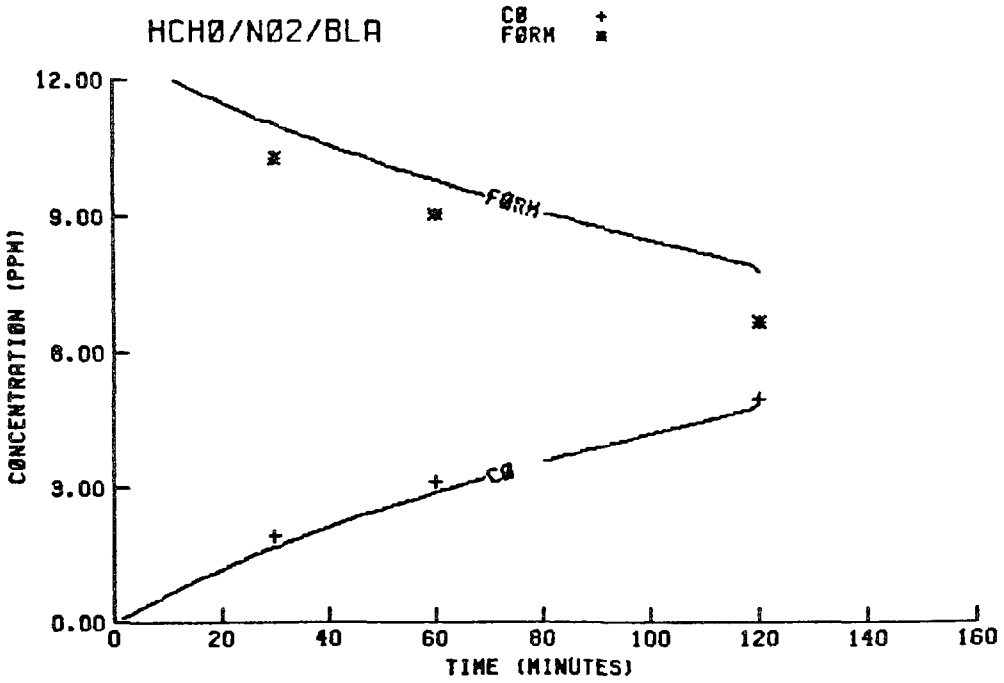
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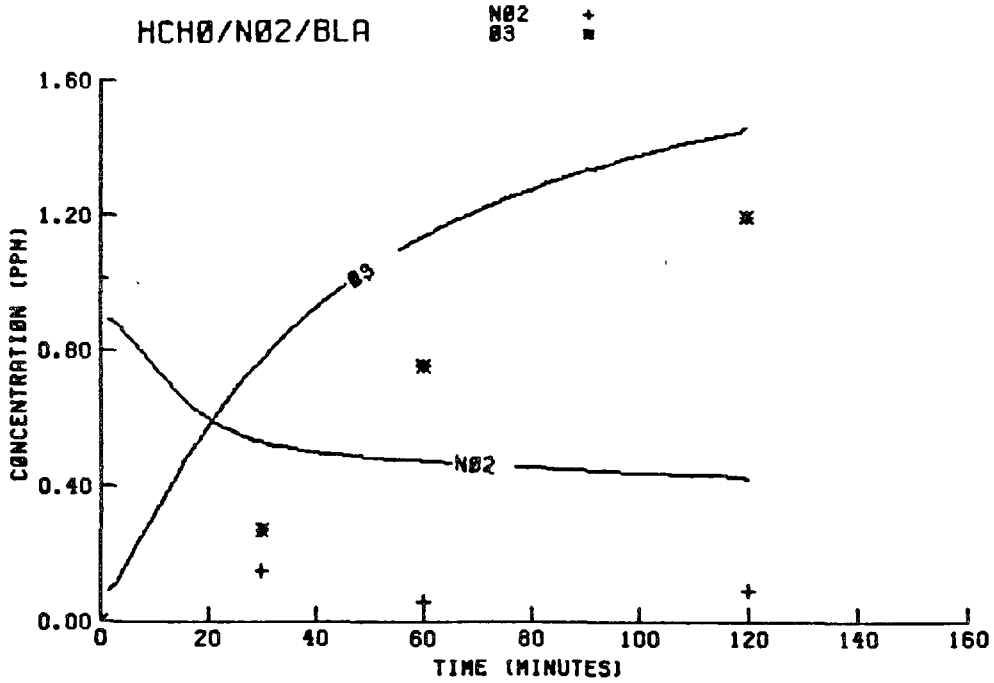
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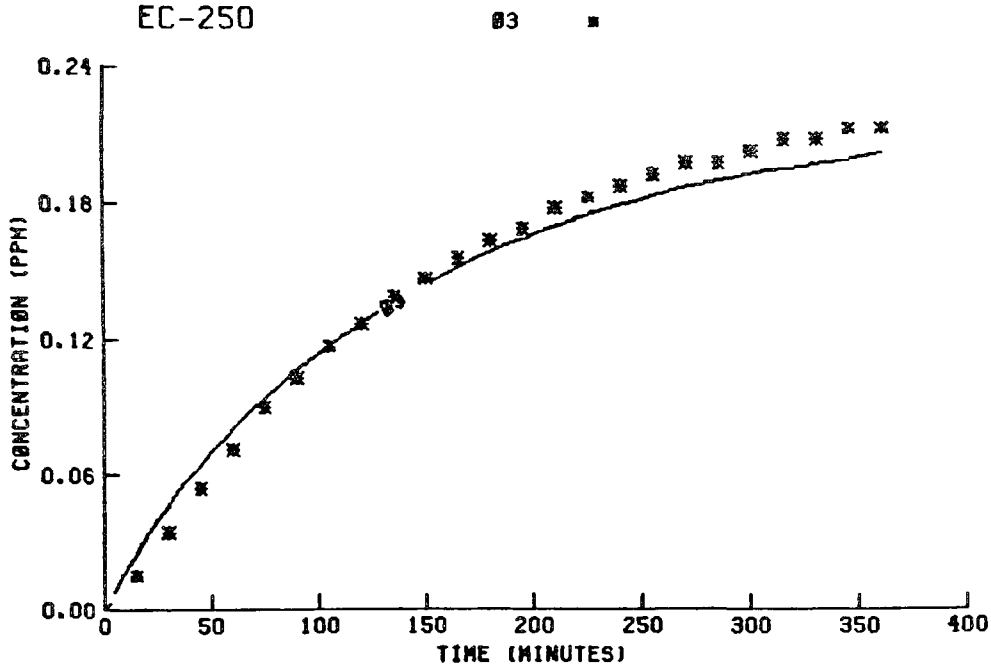
UCR FORMALDEHYDE EXPERIMENTS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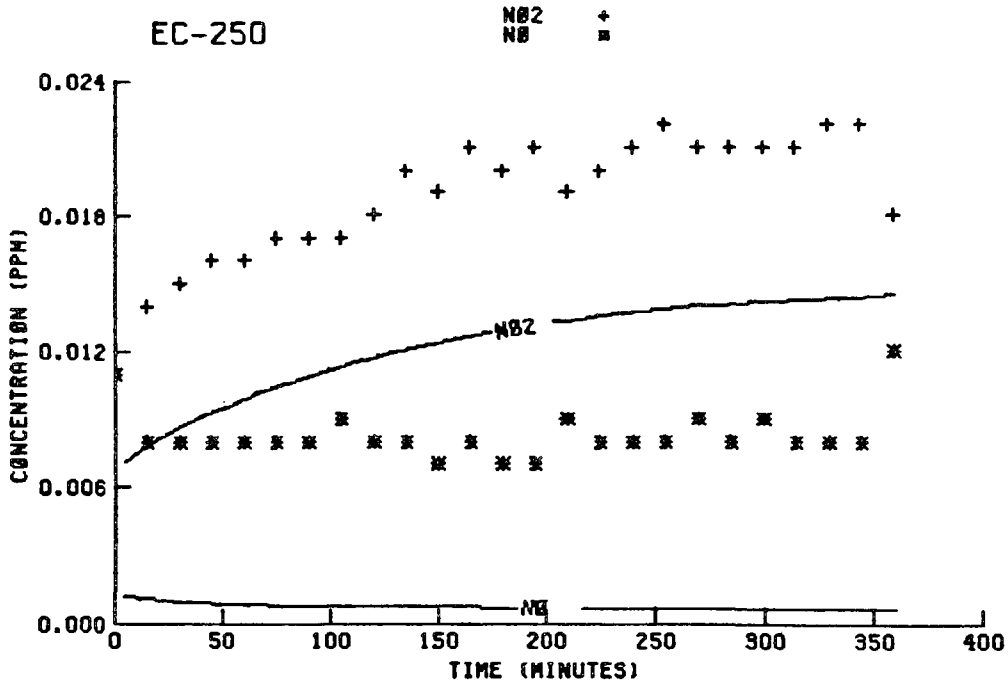
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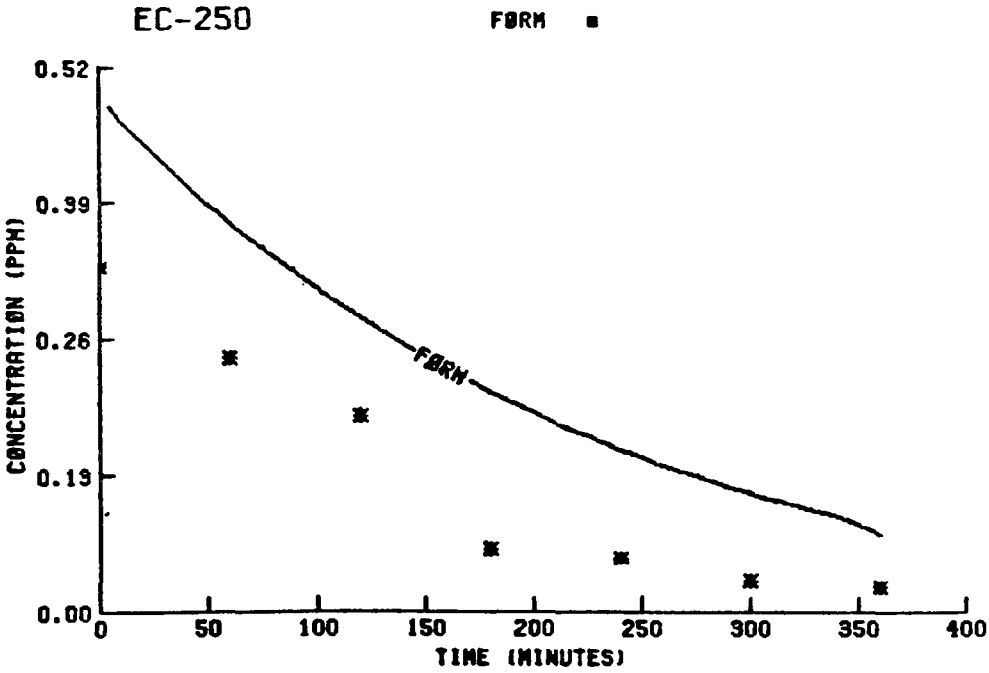
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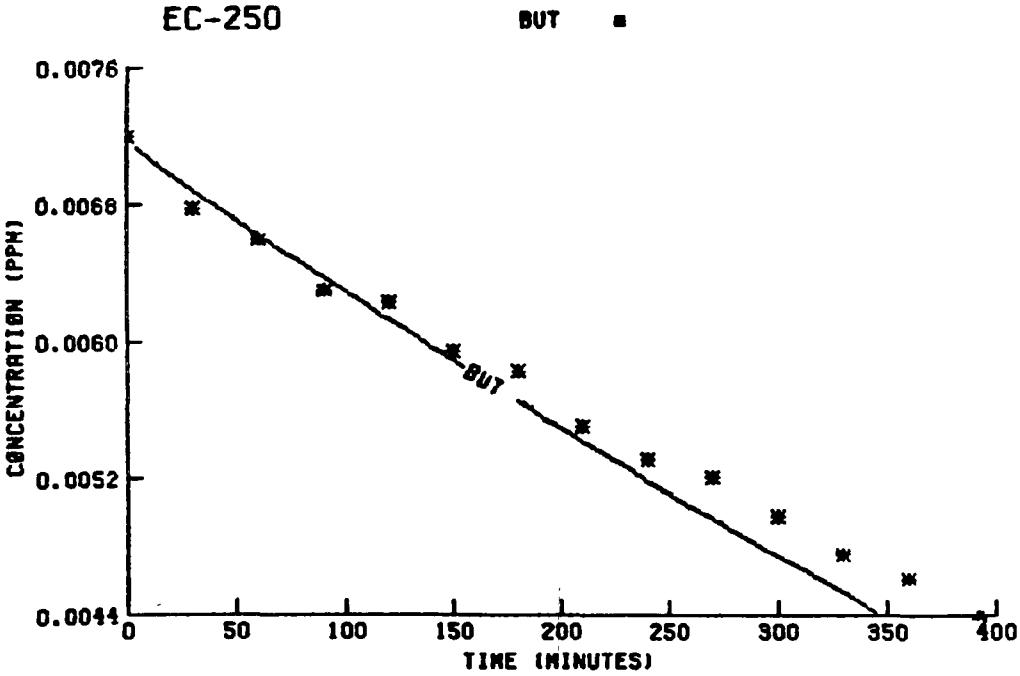
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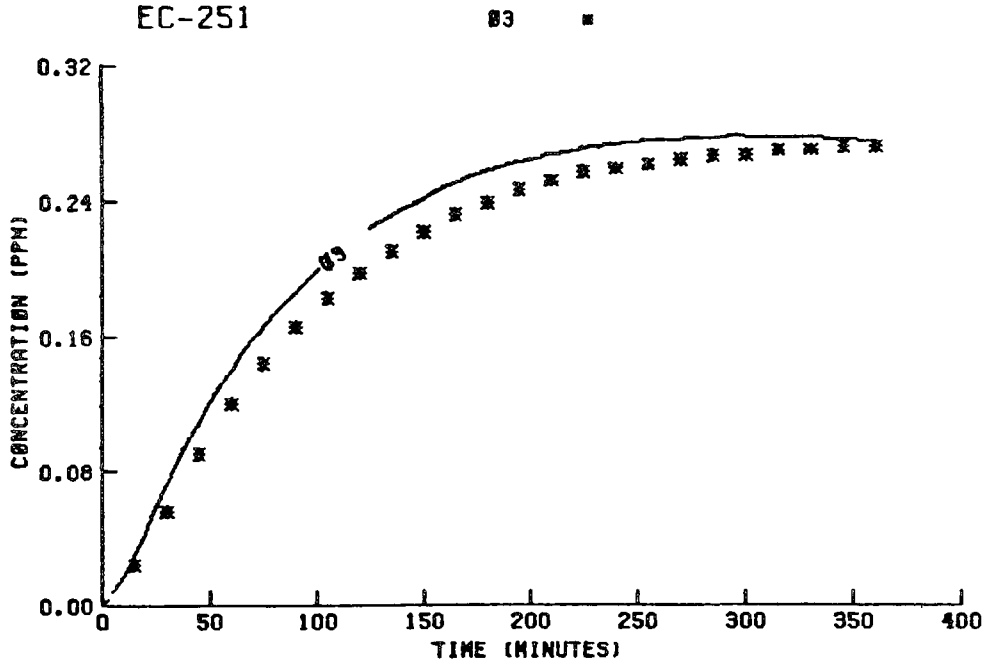
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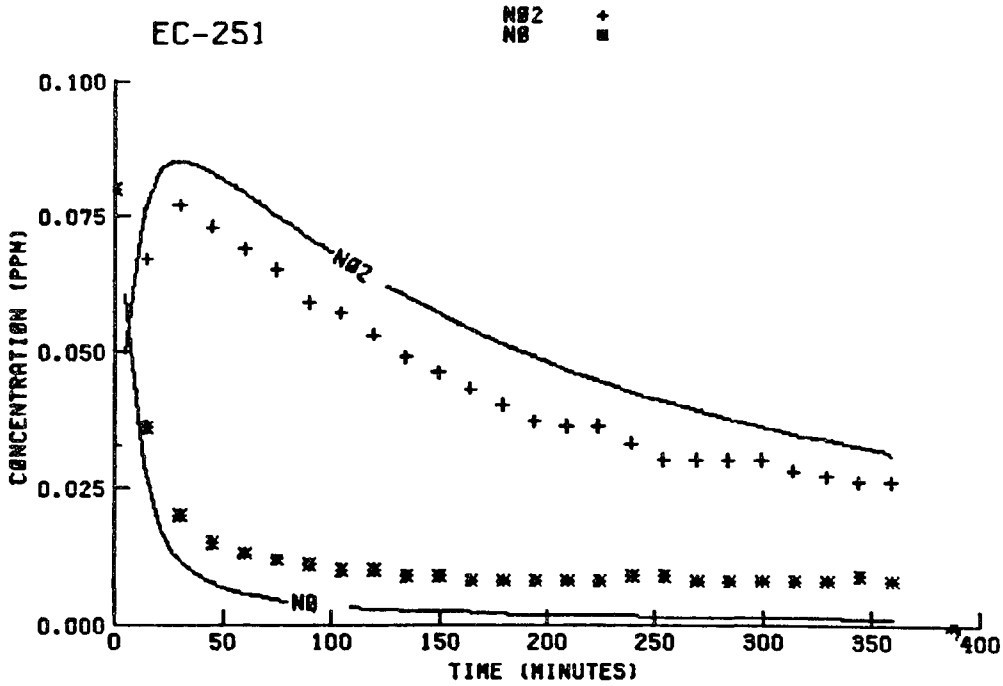
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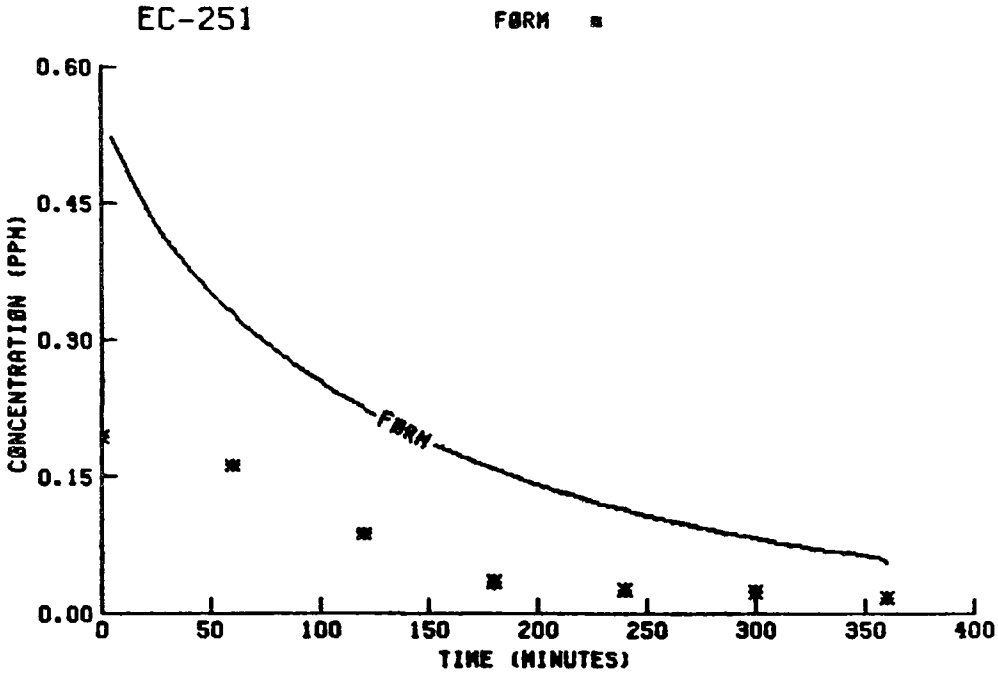
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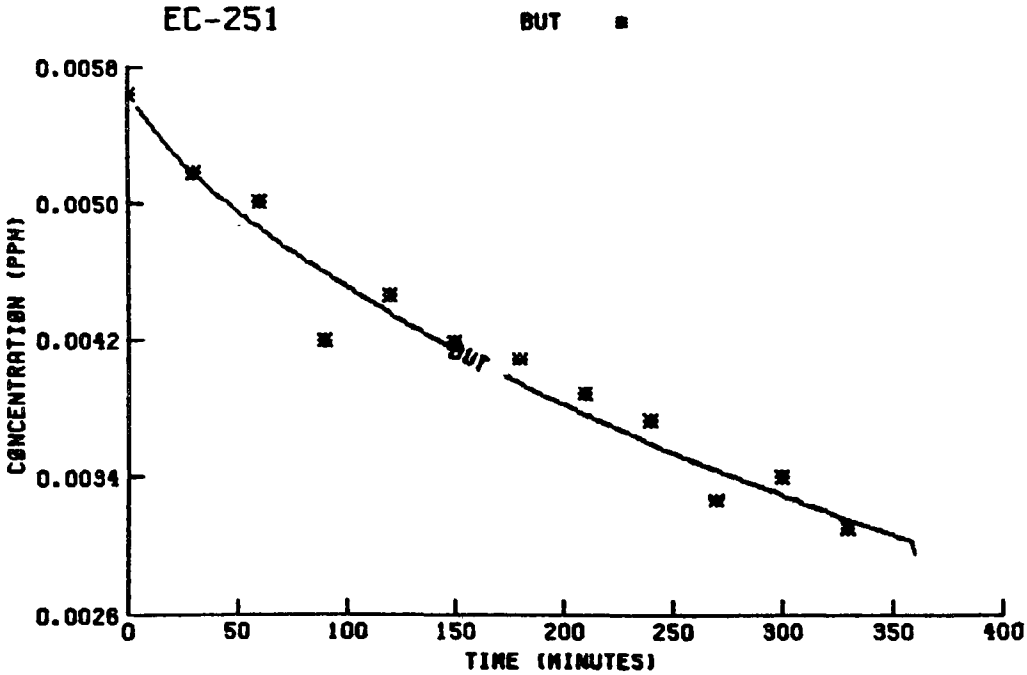
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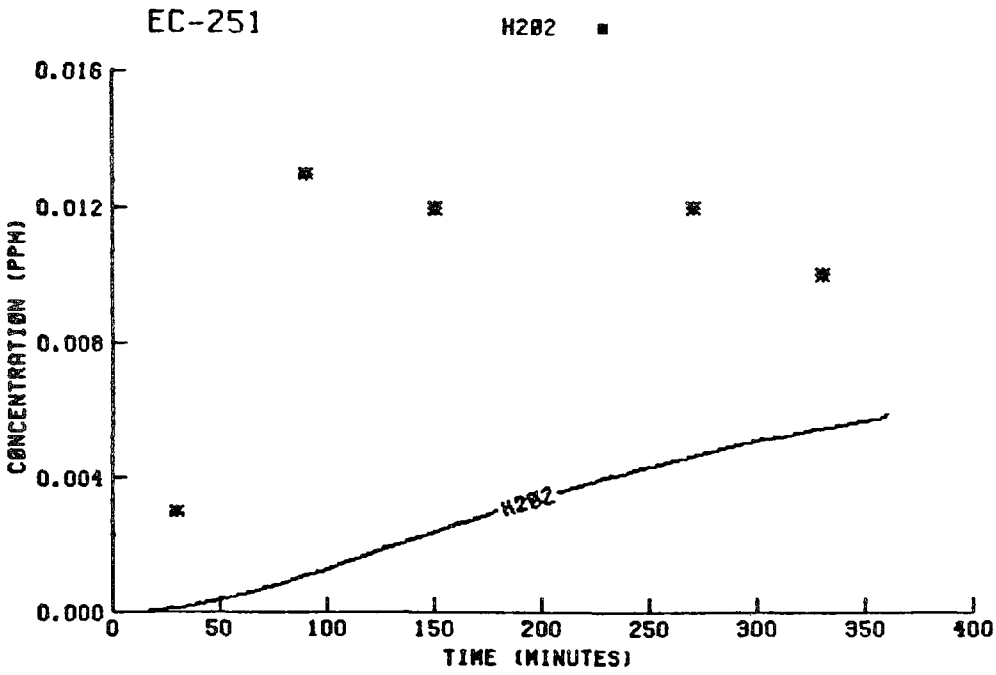
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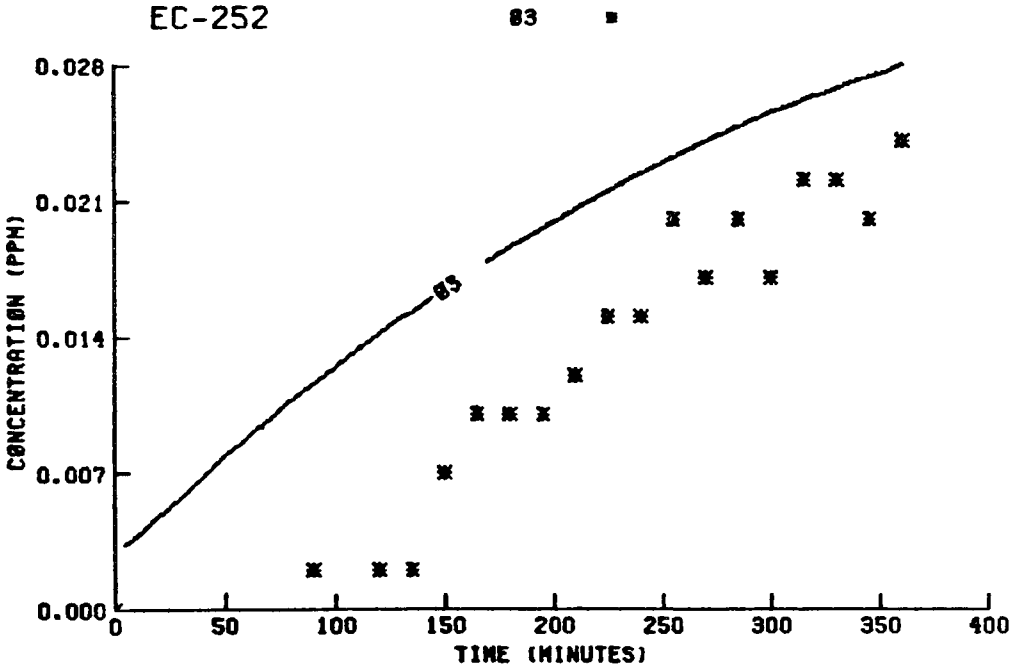
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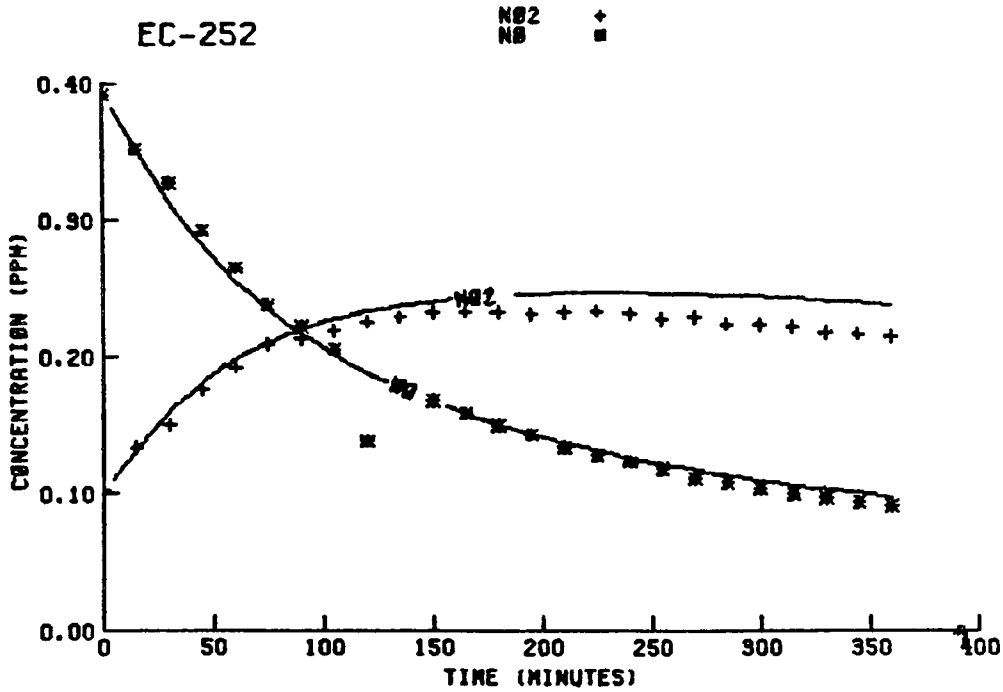
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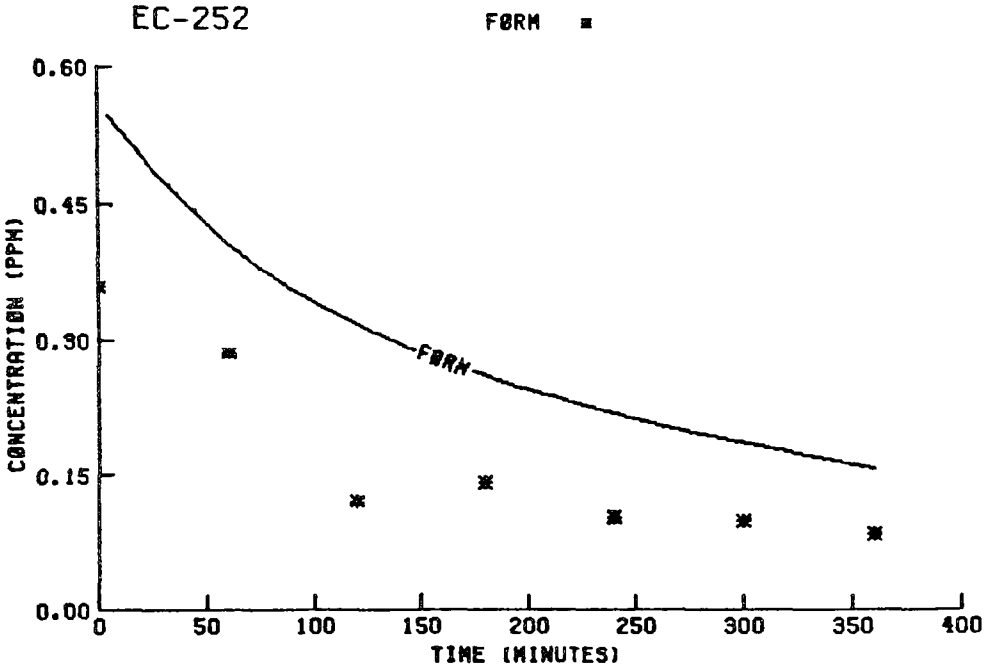
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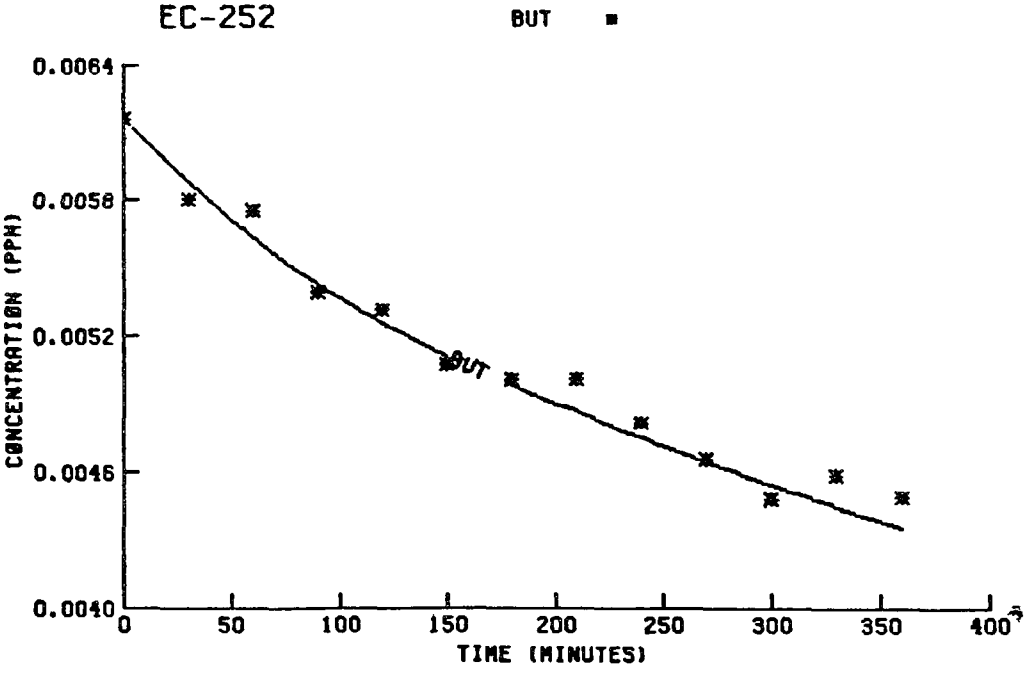
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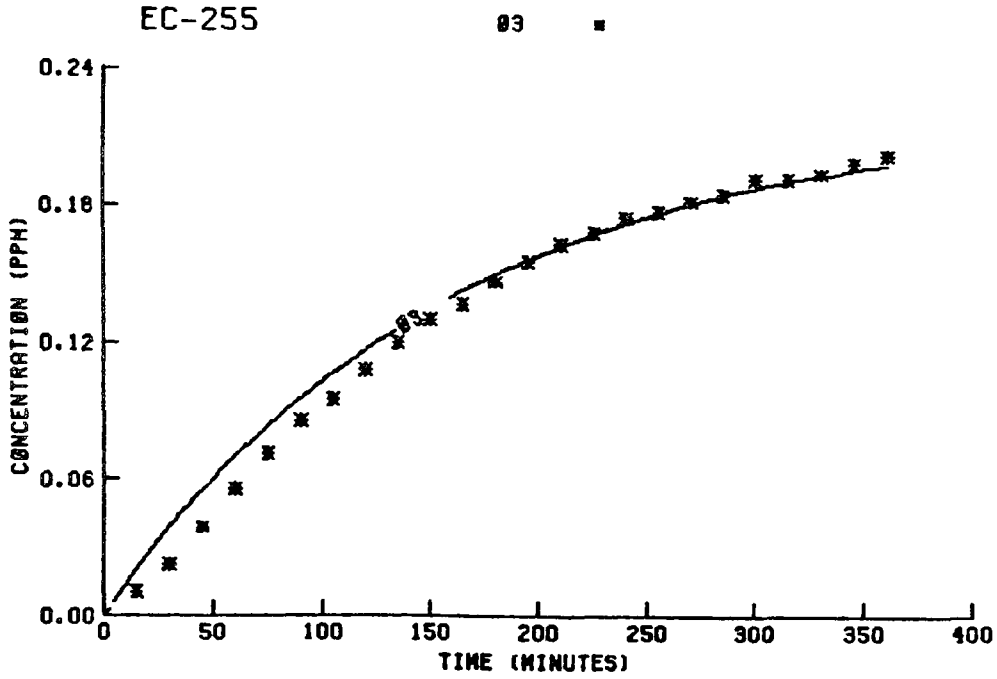
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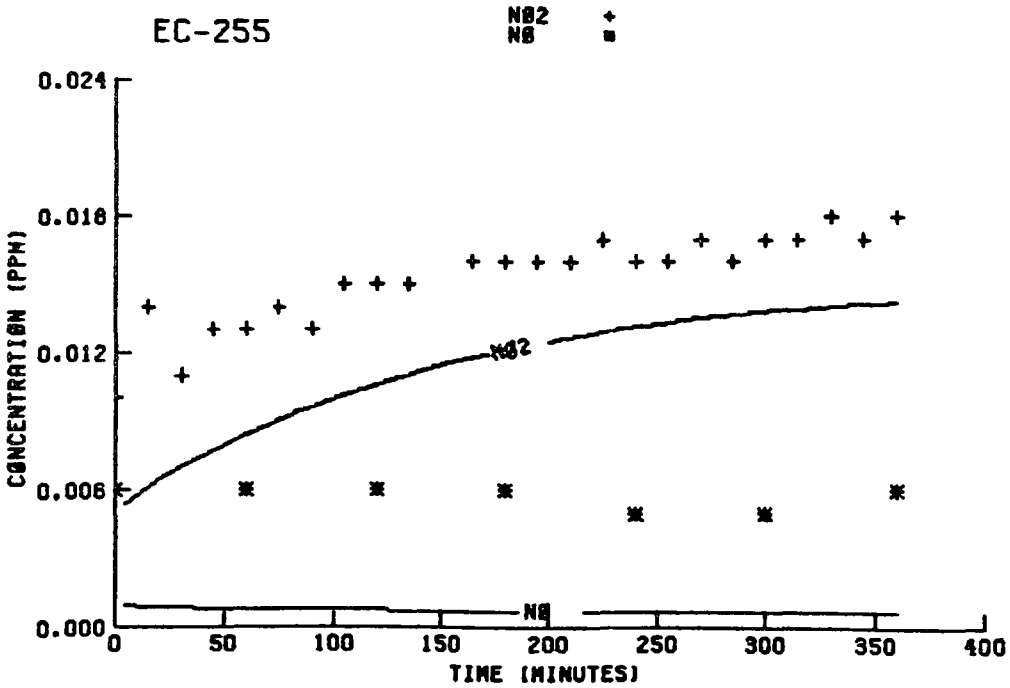
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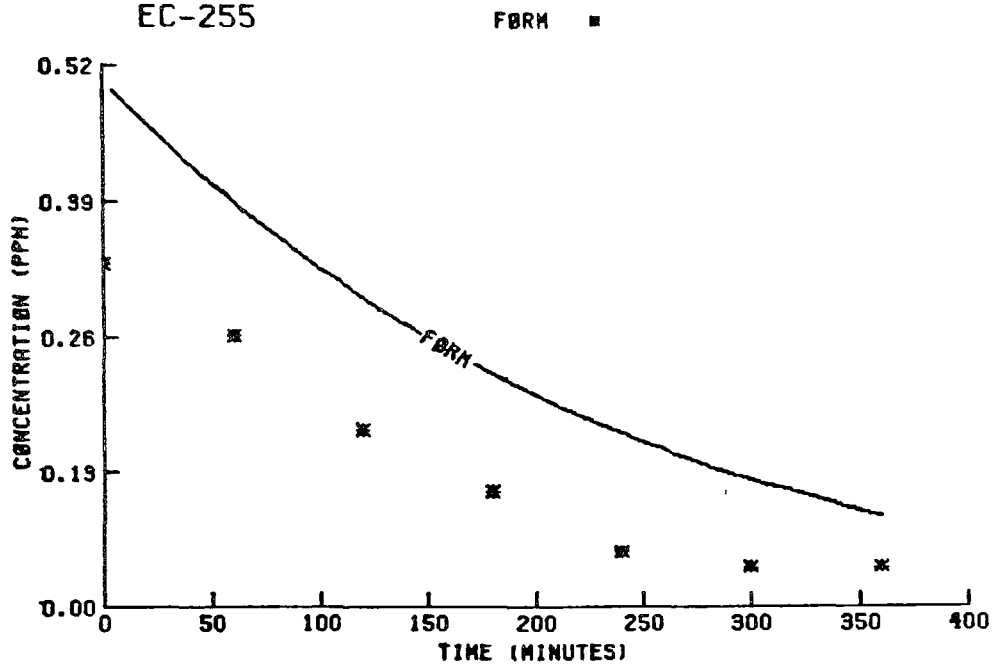
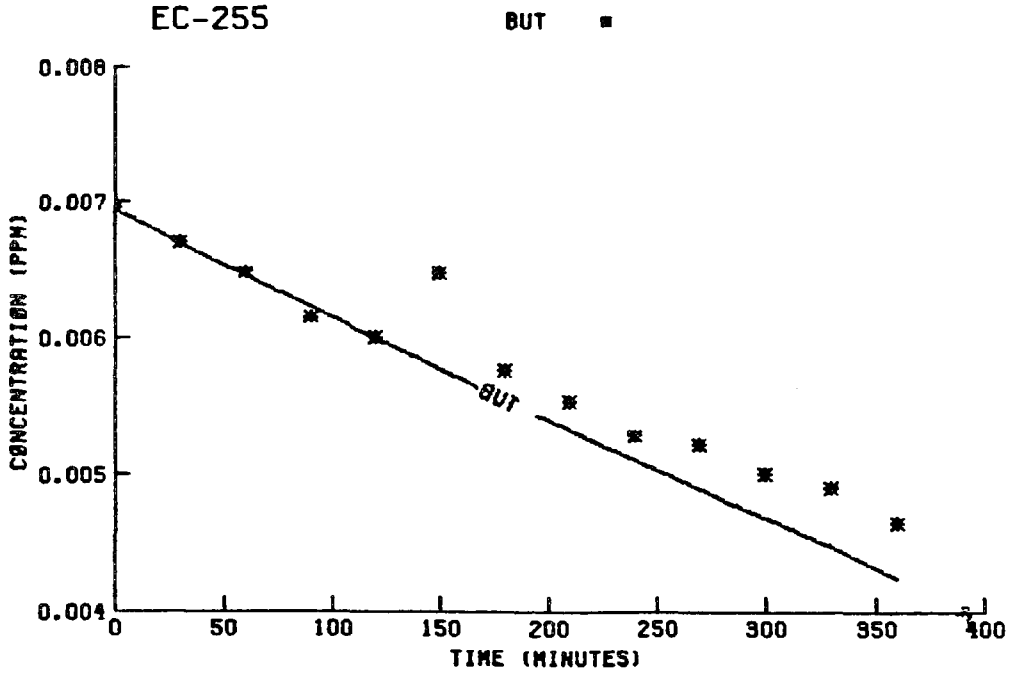
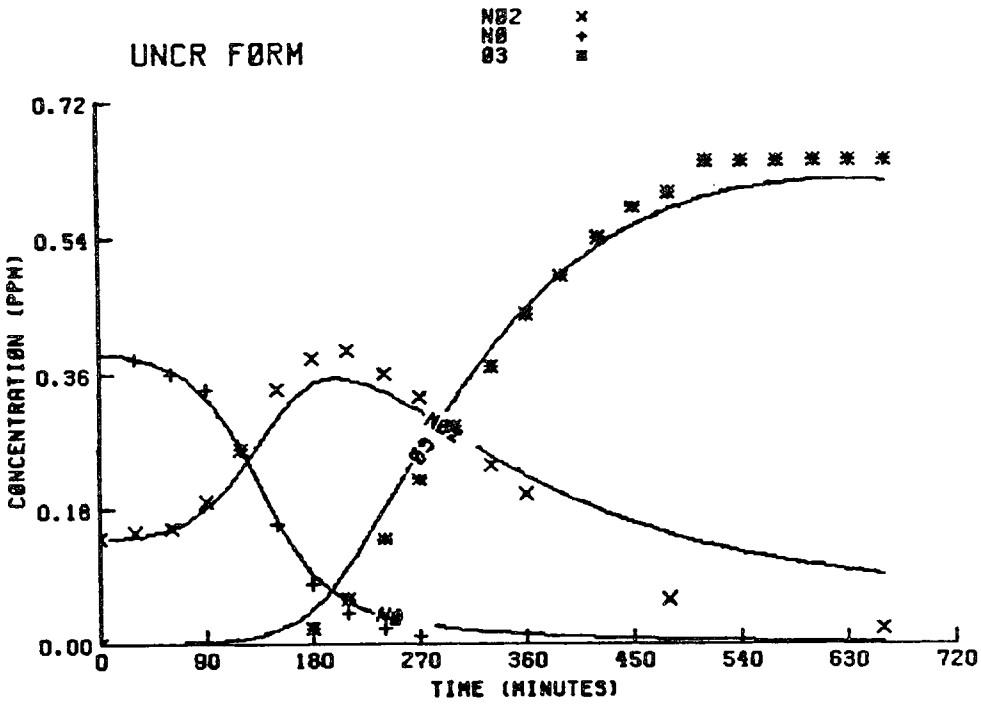
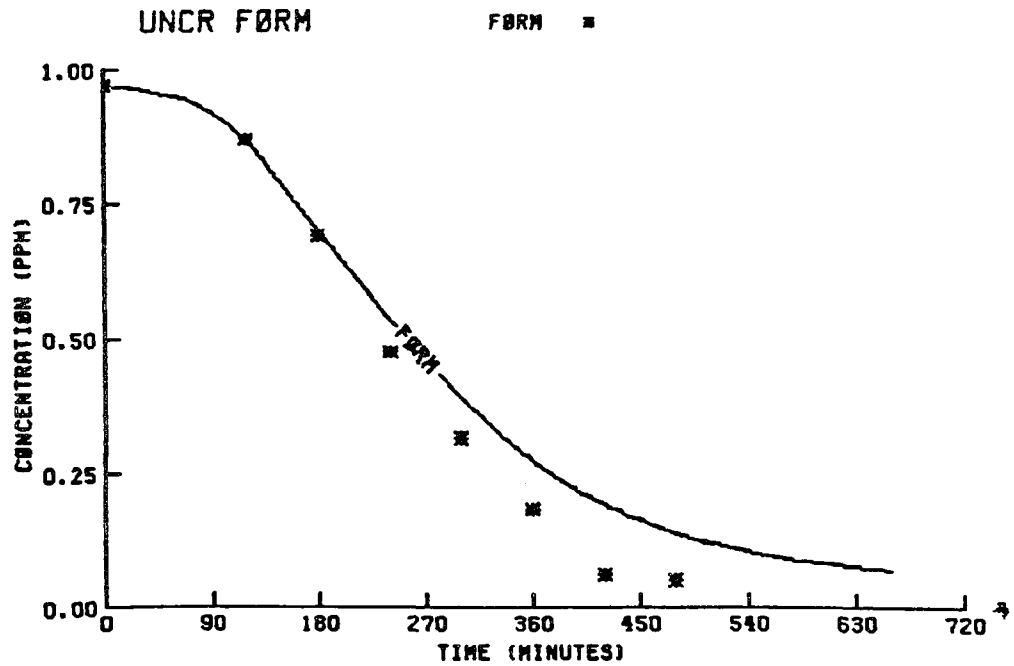
400
TIME (MINUTES)


EC-255
FORM
0.52
0.39
0.26
0.13
0.00
CONCENTRATION (PPM)
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

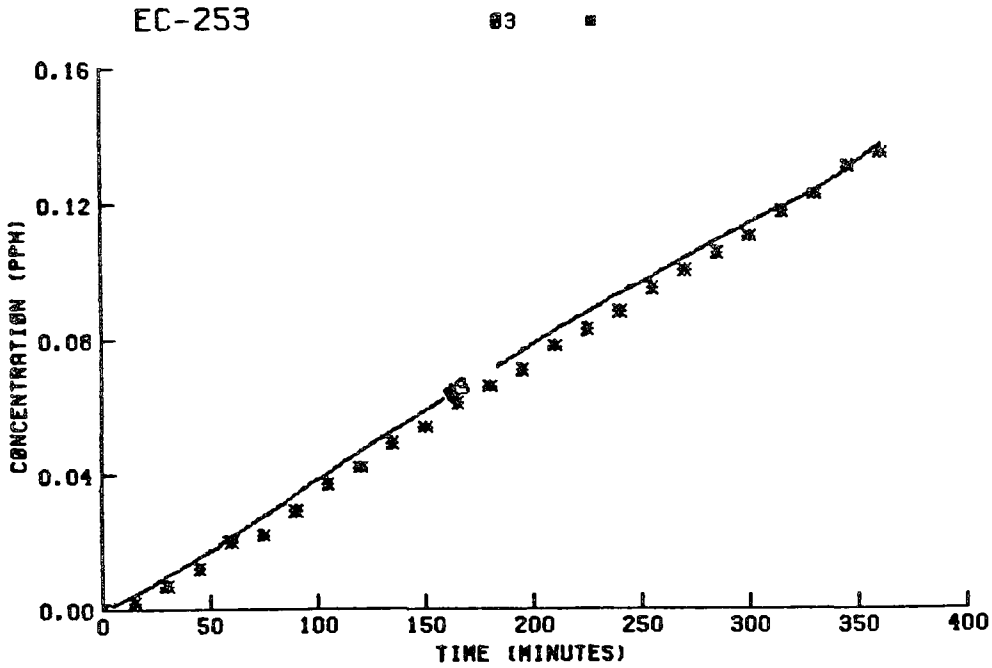

EC-255
BUT
0.008
0.007
0.006
0.005
0.004
CONCENTRATION (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

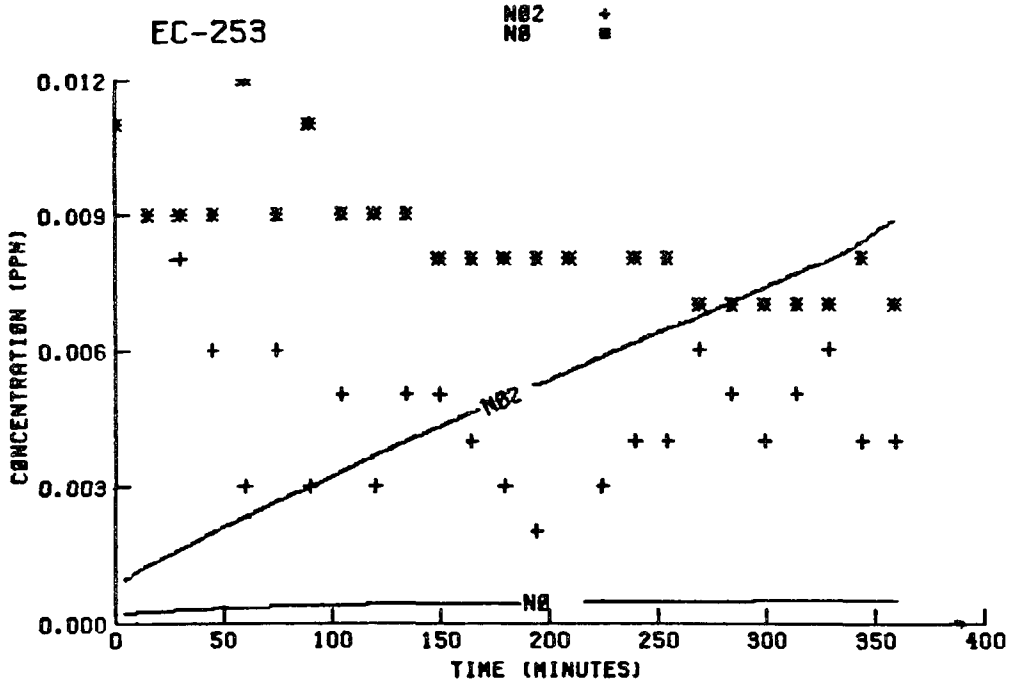
UNC FORMALDEHYDE EXPERIMENT

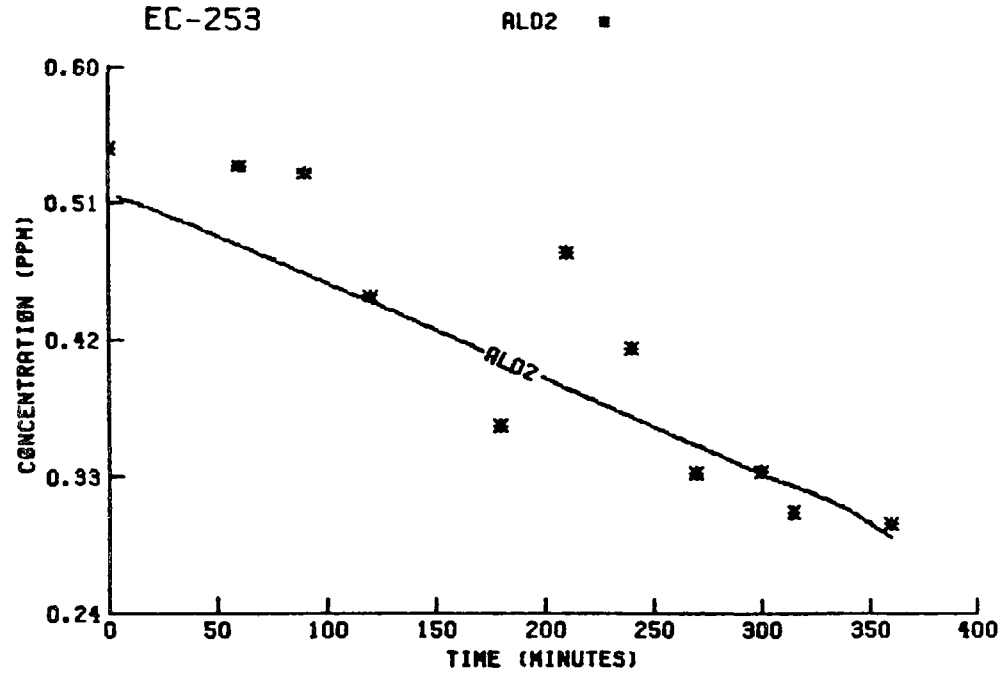

UNCR FØRM
NØ2 ×
NØ +
Ø3 ≡
0.72
0.54
0.36
0.18
0.00
CØNCENTRATIØN (PPM)
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

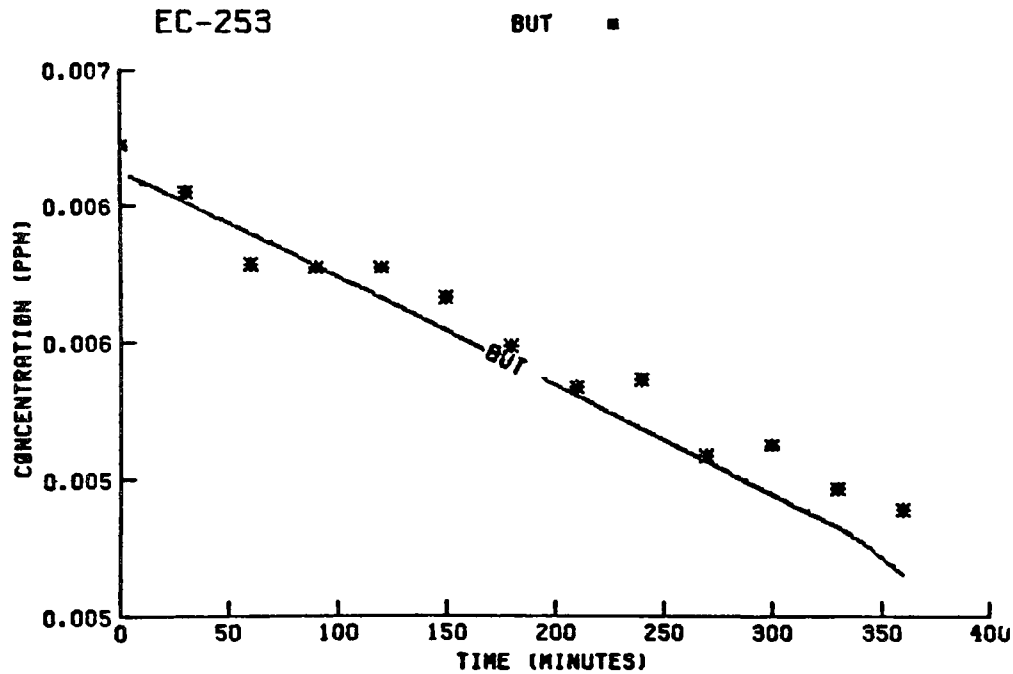

UNCR FØRM
FØRM ≡
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

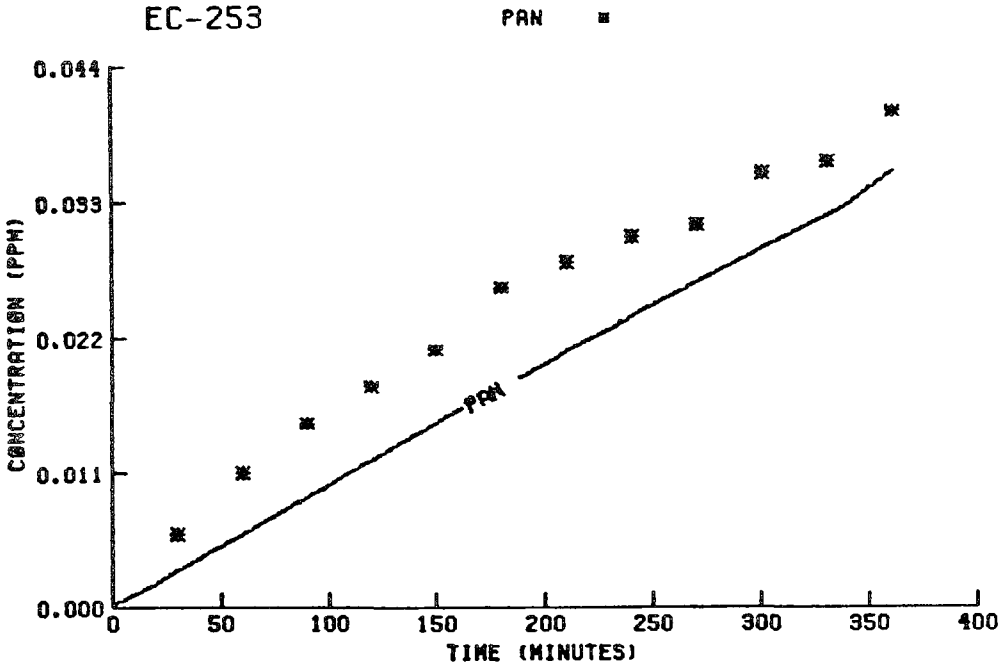
UCR ACETALDEHYDE EXPERIMENTS

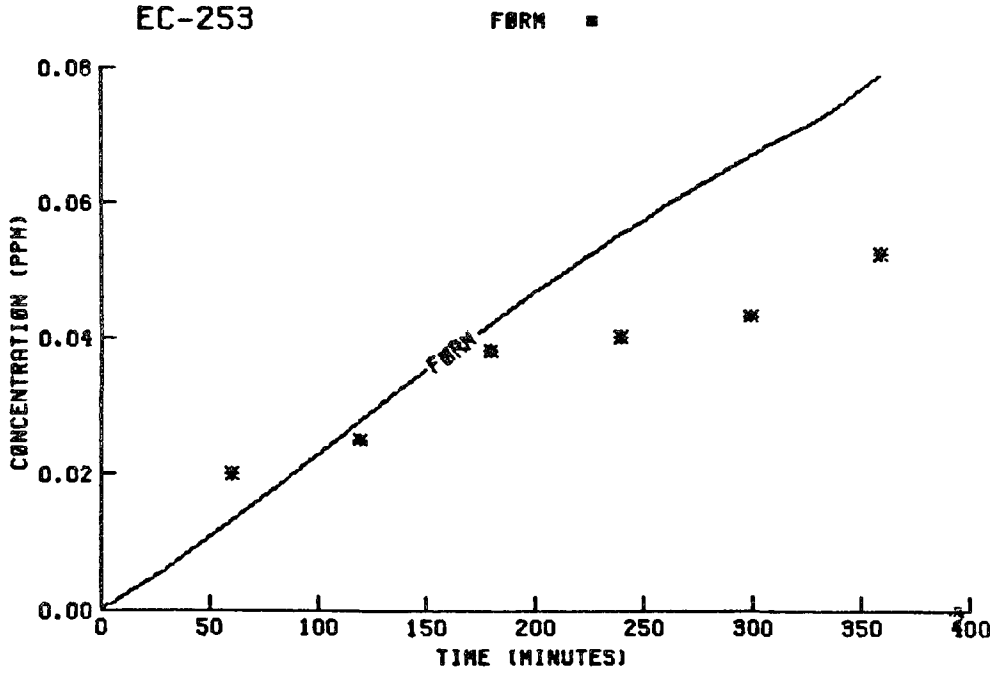

EC-253
03
0.16
0.12
0.08
0.04
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

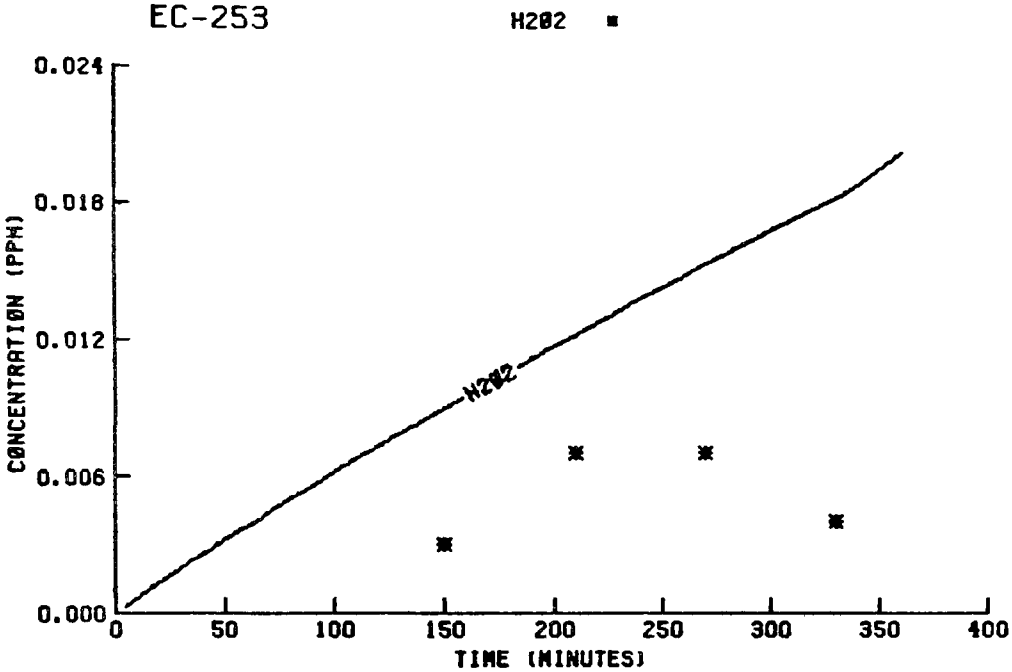

EC-253
NO2
NO
0.012
0.009
0.006
0.003
0.000
CONCENTRATION (PPM)
NO2
NO
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

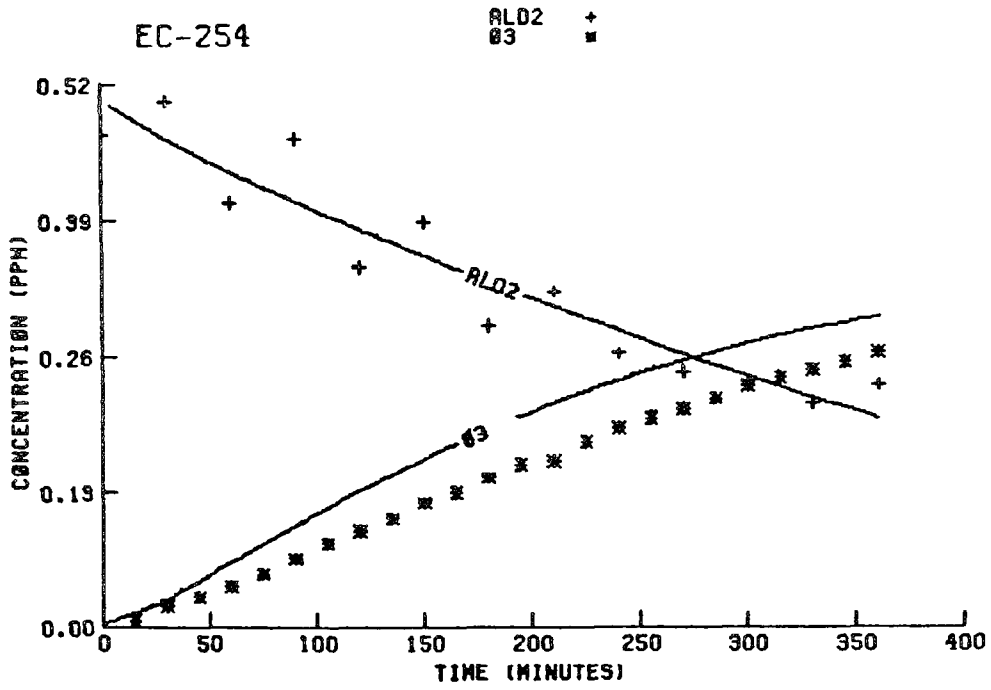

EC-253
ALD2
0.60
0.51
0.42
0.33
0.24
CONCENTRATION (PPM)
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

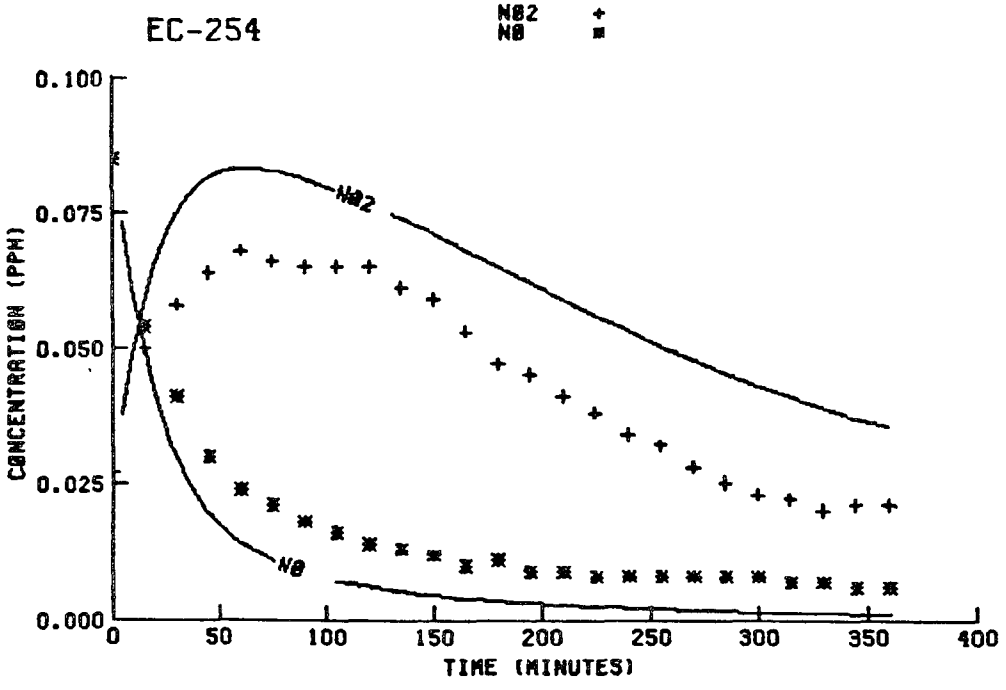

EC-253
BUT
0.007
0.006
0.006
0.005
0.005
CONCENTRATION (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

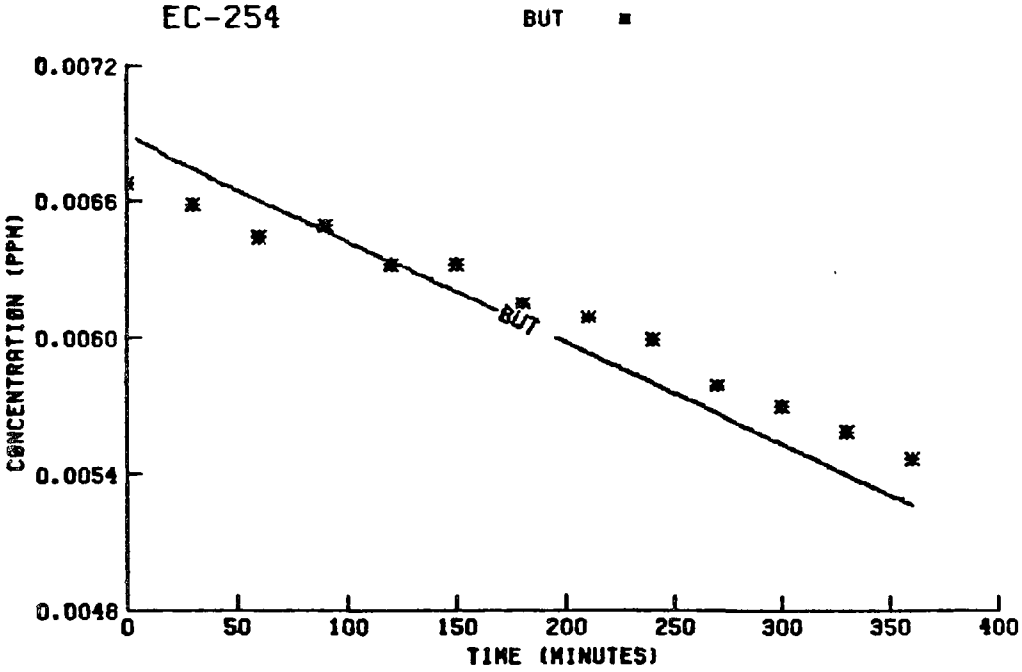

EC-253
PAN
0.044
0.033
0.022
0.011
0.000
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

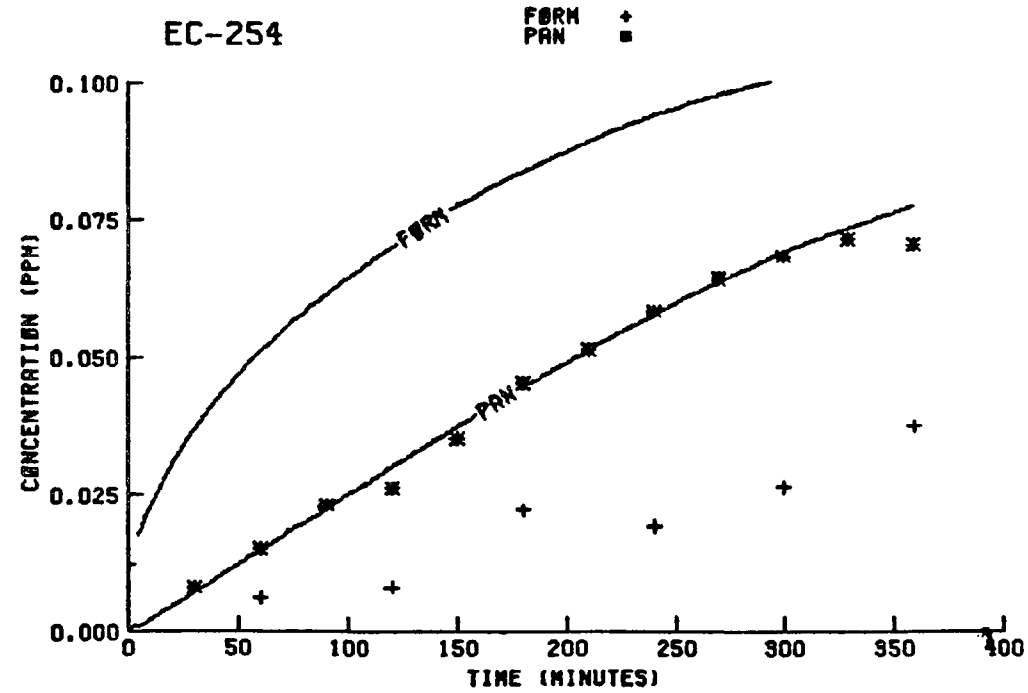

EC-253
FORM
0.08
0.06
0.04
0.02
0.00
CONCENTRATION (PPM)
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

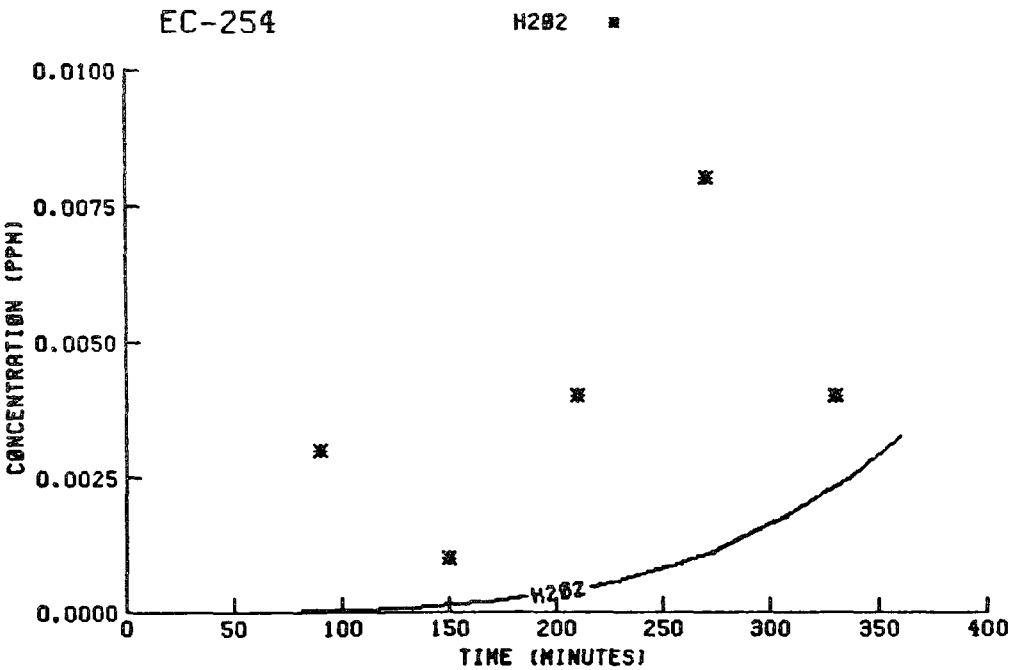

EC-253
H202
0.024
0.018
0.012
0.006
0.000
CONCENTRATION (PPM)
H202
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-254
RLO2 +
03 ■
0.52
0.39
0.26
0.13
0.00
CONCENTRATION (PPM)
RLO2
03
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

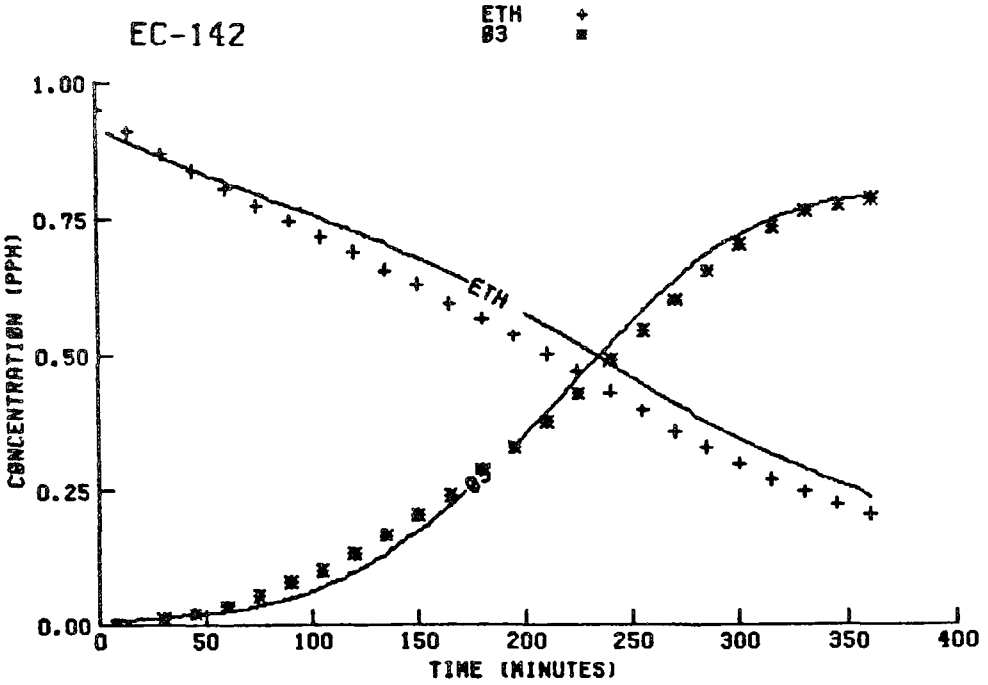

EC-254
NO2 +
NO ■
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
NO2
NO
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

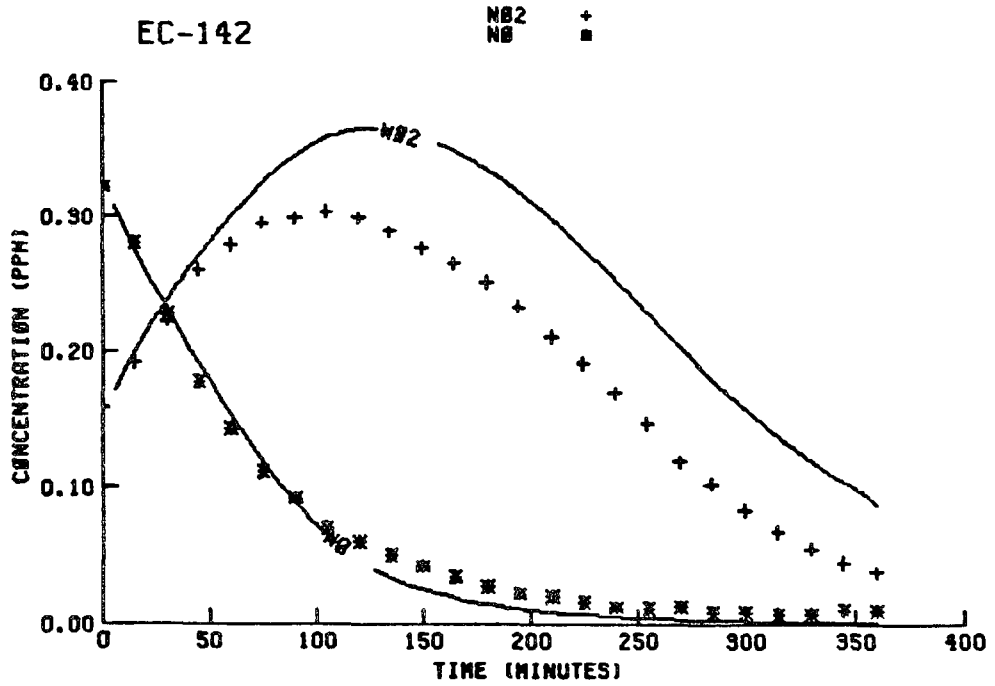

EC-254
BUT
0.0072
0.0066
0.0060
0.0054
0.0048
CONCENTRATION (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

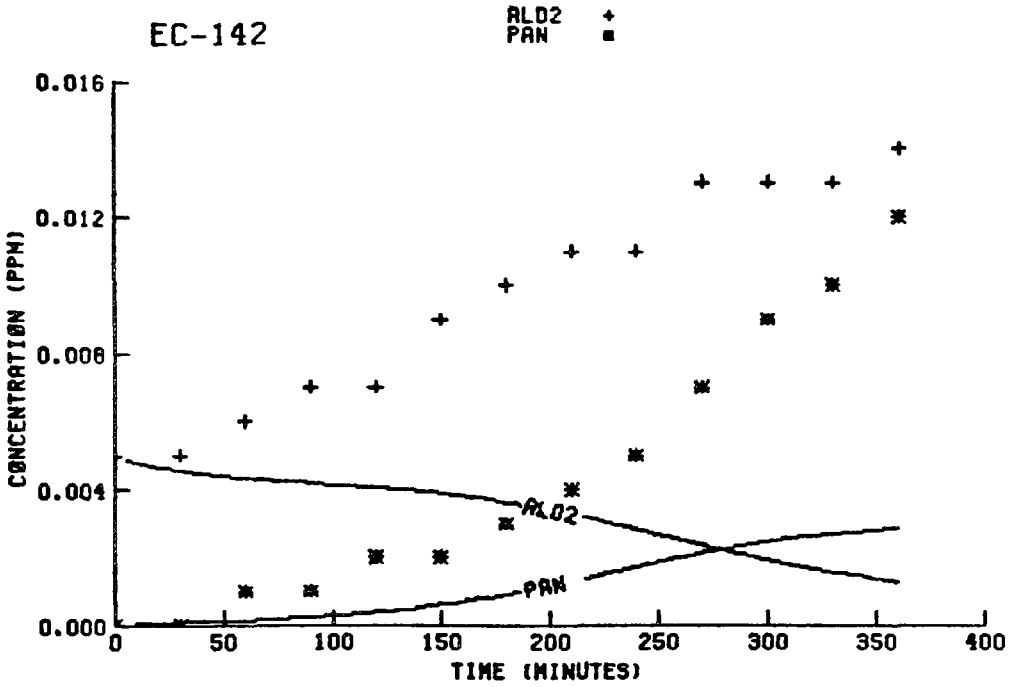

EC-254
FORM
PAN
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
FORM
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

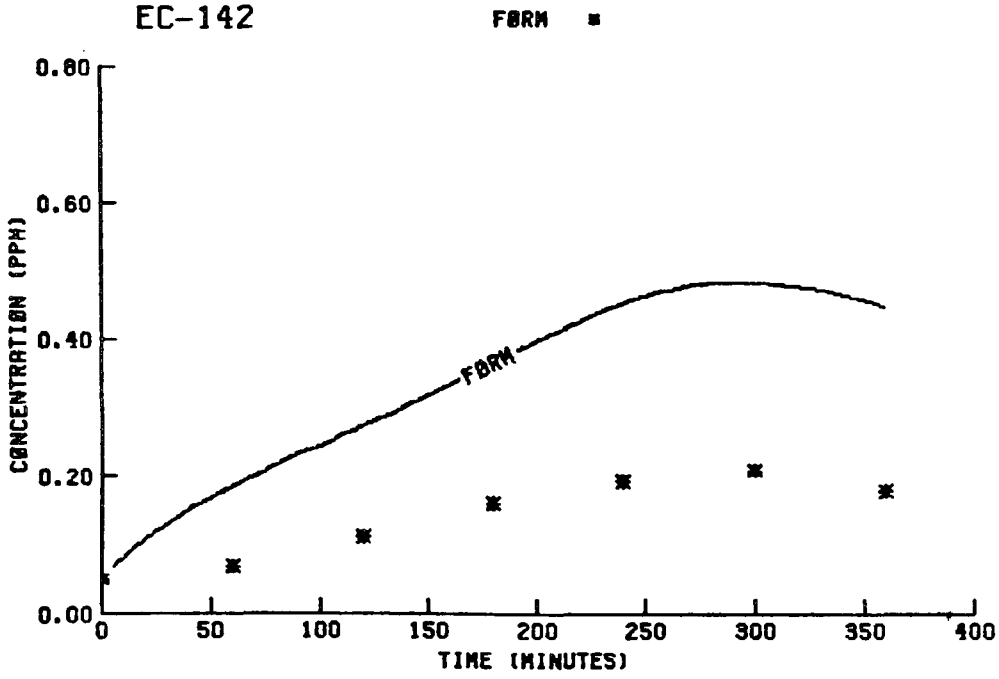

EC-254
H202
0.0100
0.0075
0.0050
0.0025
0.0000
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
H202

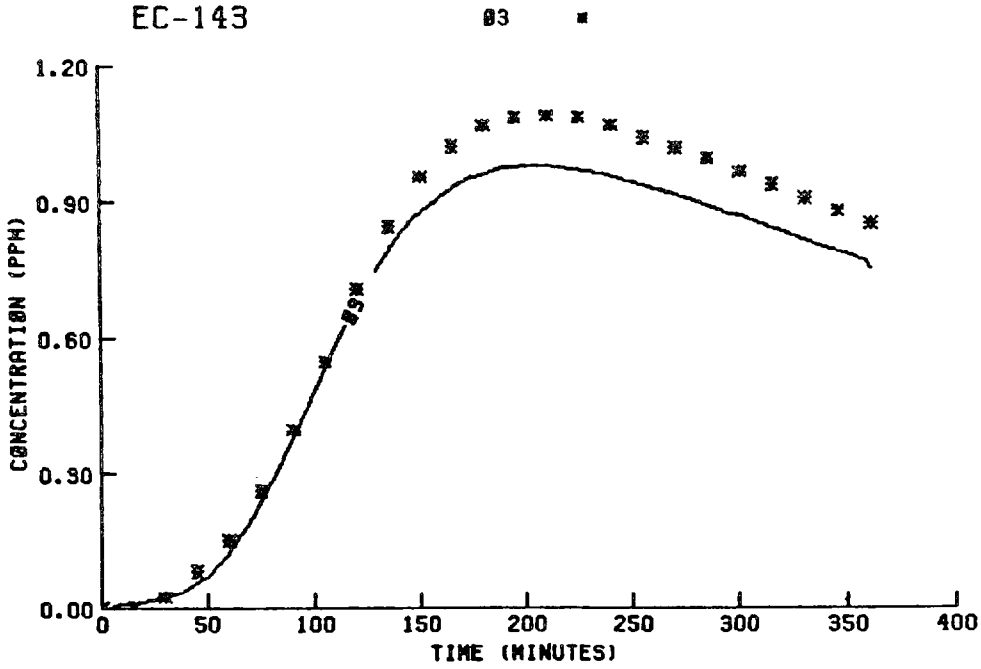
UCR ETHYLENE EXPERIMENTS

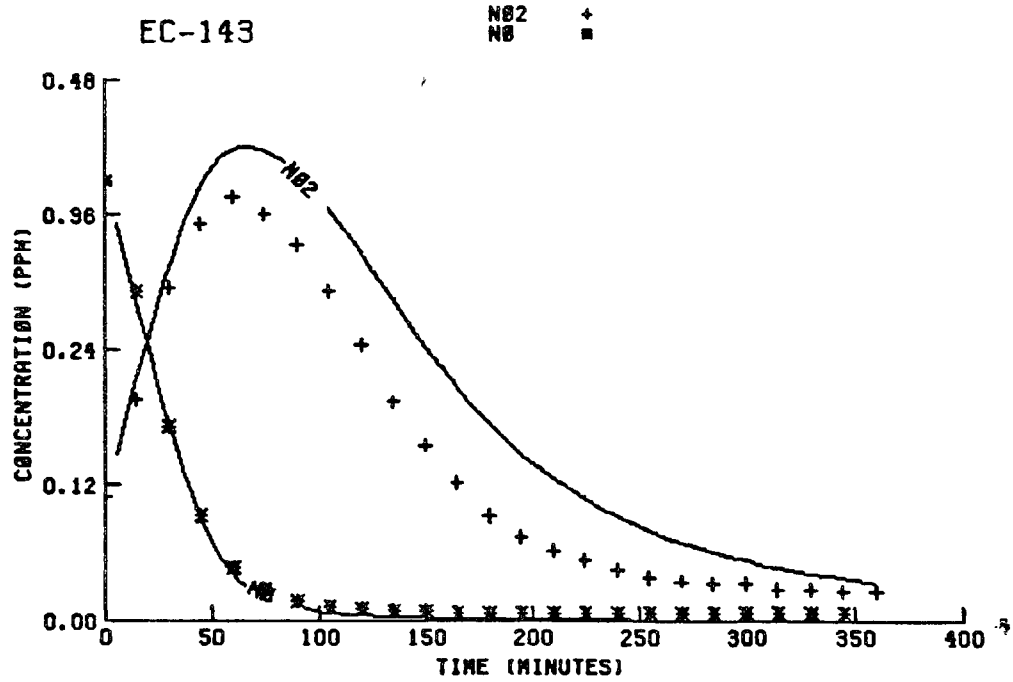

EC-142
ETH
O3
1.00
0.75
0.50
0.25
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

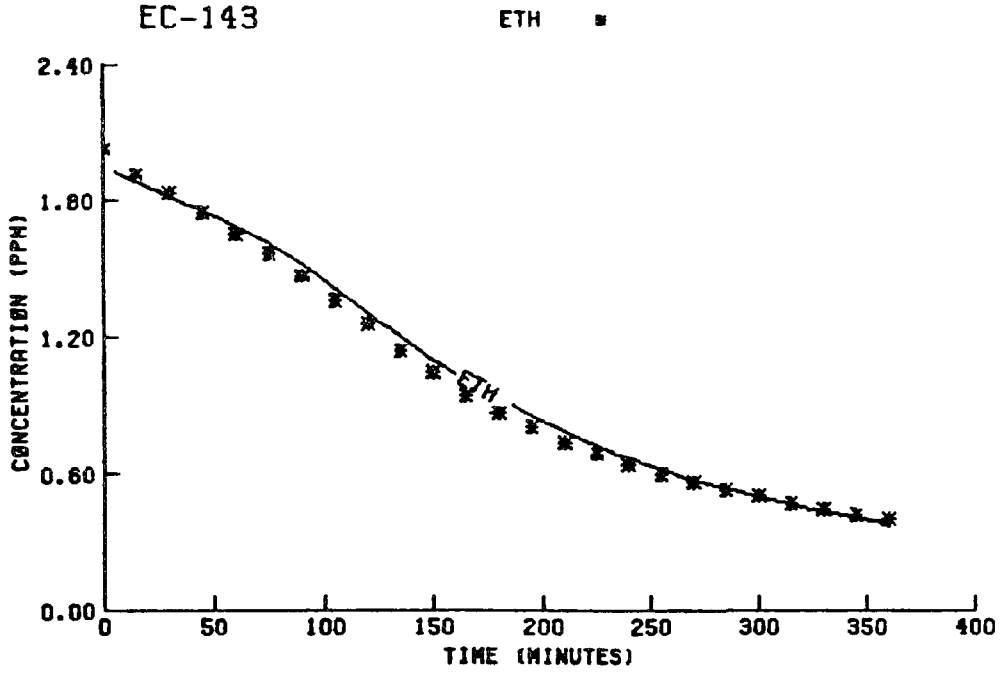

EC-142
NO2
NO
0.40
0.30
0.20
0.10
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

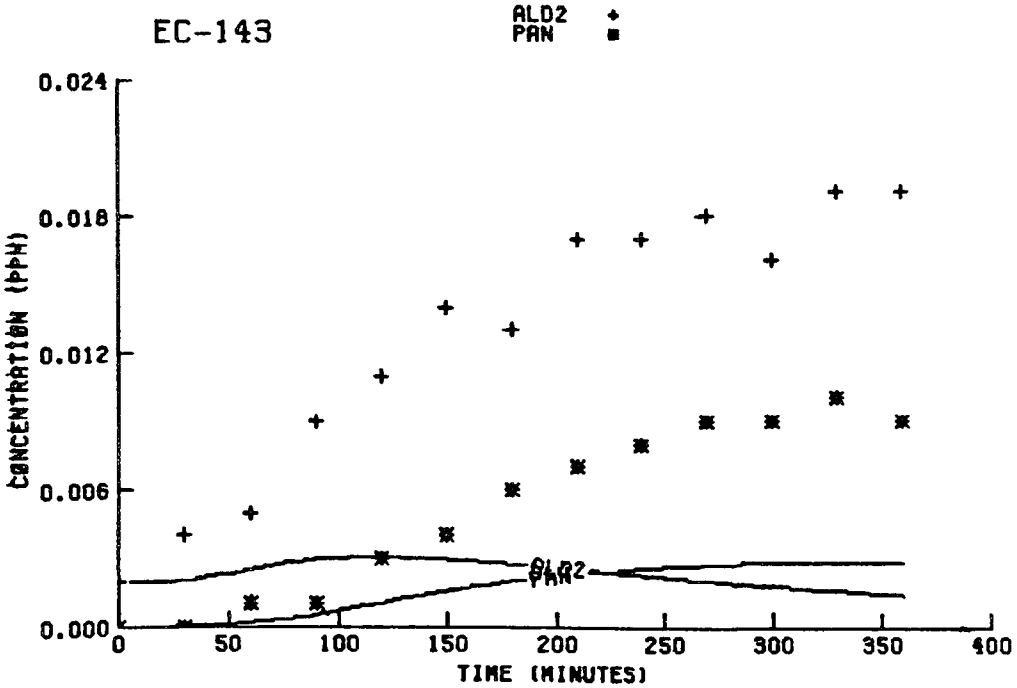

EC-142
RLD2 +
PAN ■
0.016
0.012
0.008
0.004
0.000
CONCENTRATION (PPM)
RLD2
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

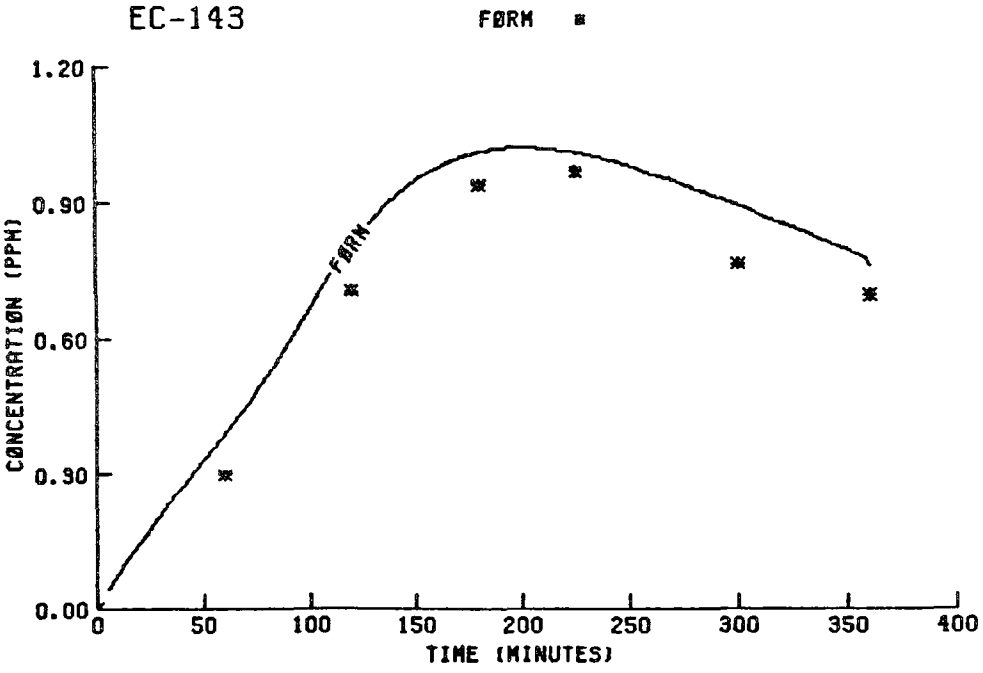

EC-142
FORM ■
0.80
0.60
0.40
0.20
0.00
CONCENTRATION (PPM)
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

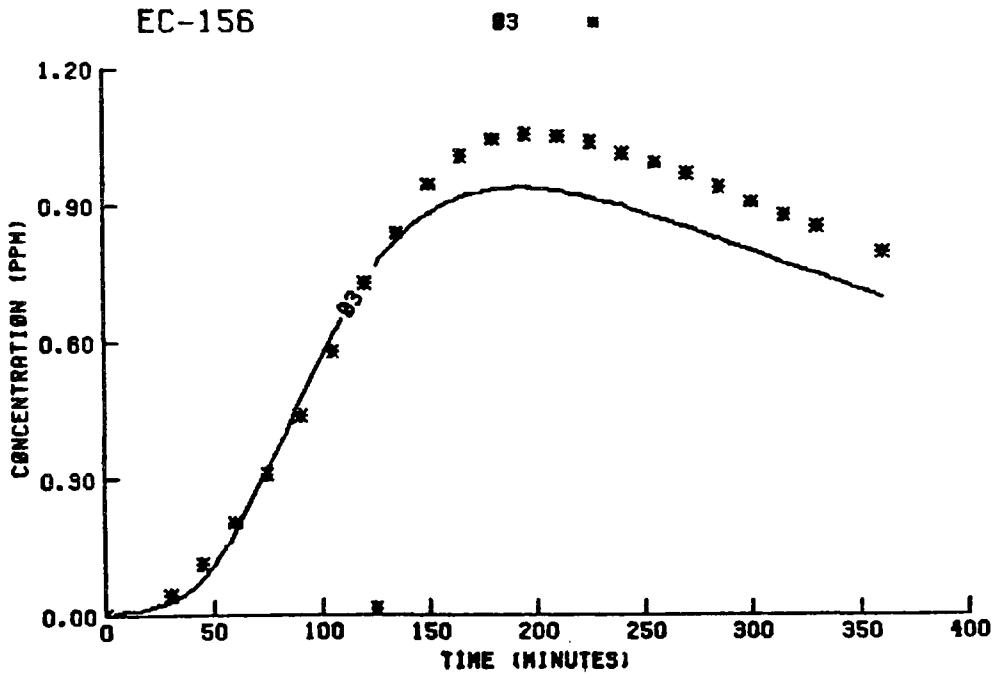

EC-143
03
1.20
0.90
0.60
0.30
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

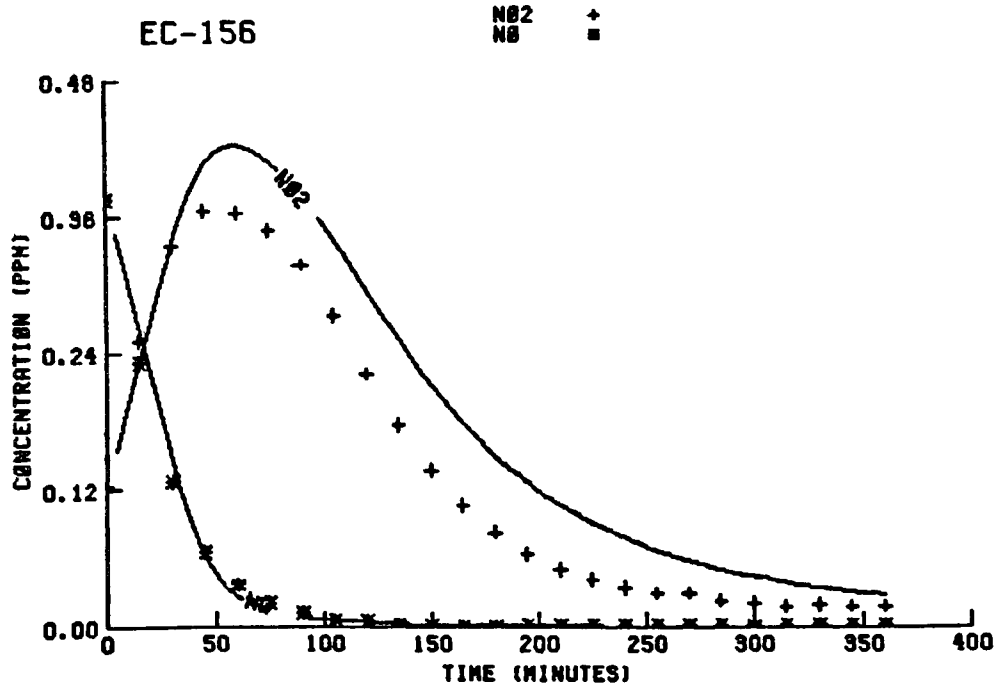

EC-143
NO2
NO
0.48
0.36
0.24
0.12
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

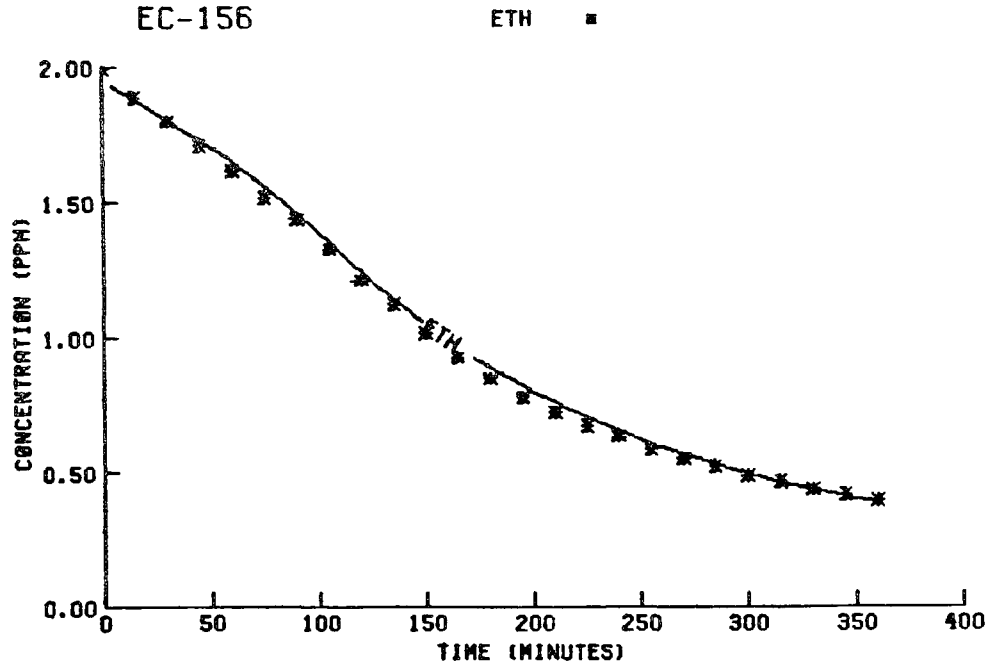

EC-143
ETH
2.40
1.80
1.20
0.60
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

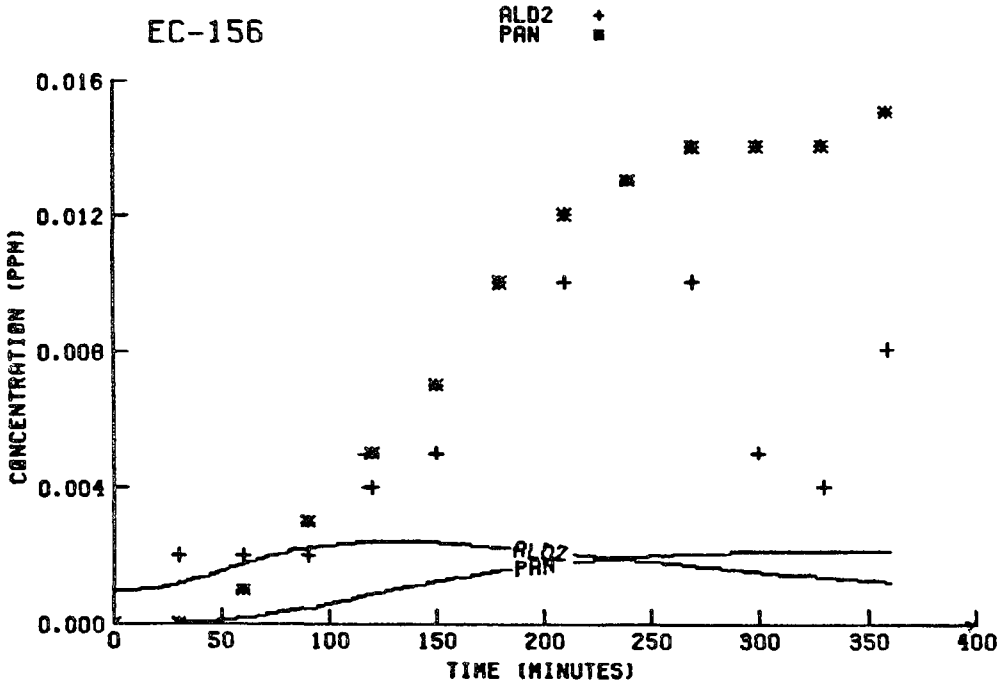

EC-143
ALD2
PAN
0.024
0.018
0.012
0.006
0.000
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

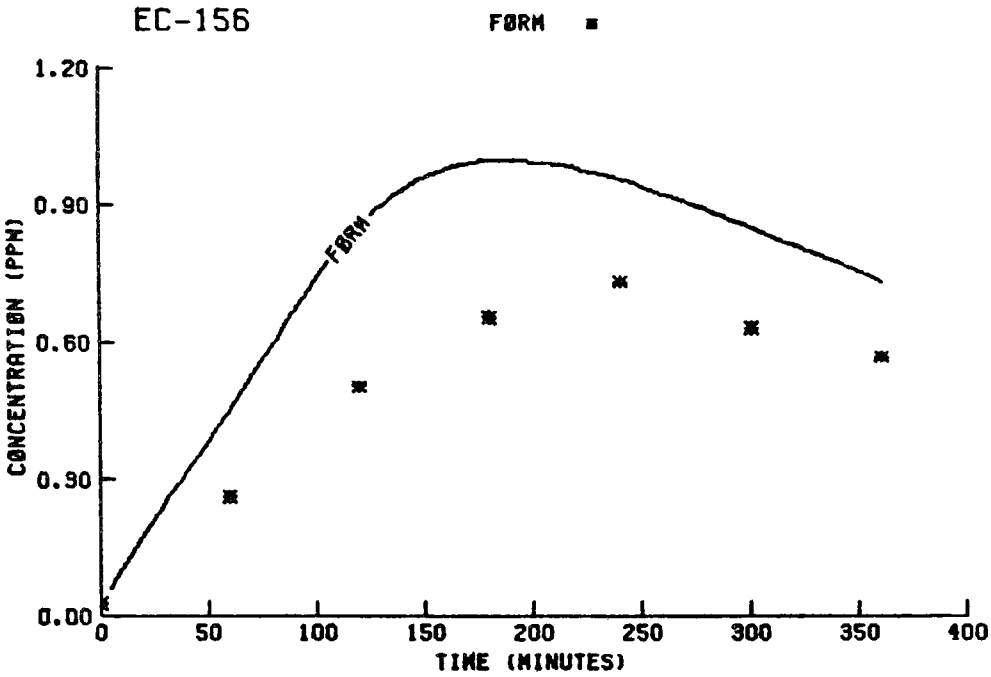

EC-143
FORM
1.20
0.90
0.60
0.30
0.00
CONCENTRATION (PPM)
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

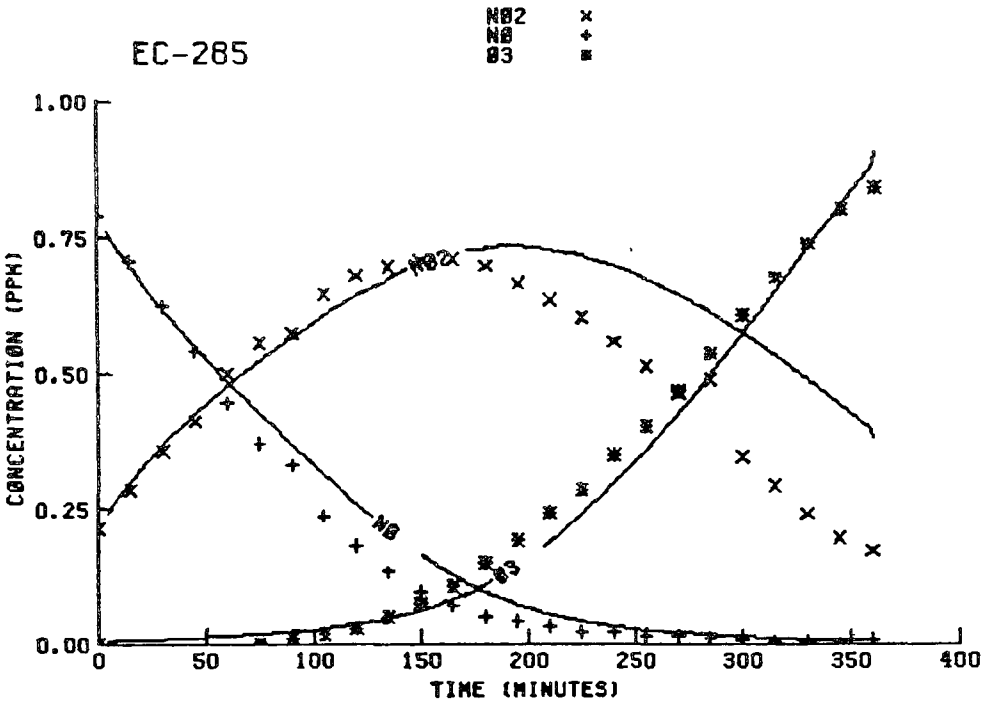

EC-156
O3
1.20
0.90
0.60
0.30
0.00
CONCENTRATION (PPM)
O3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

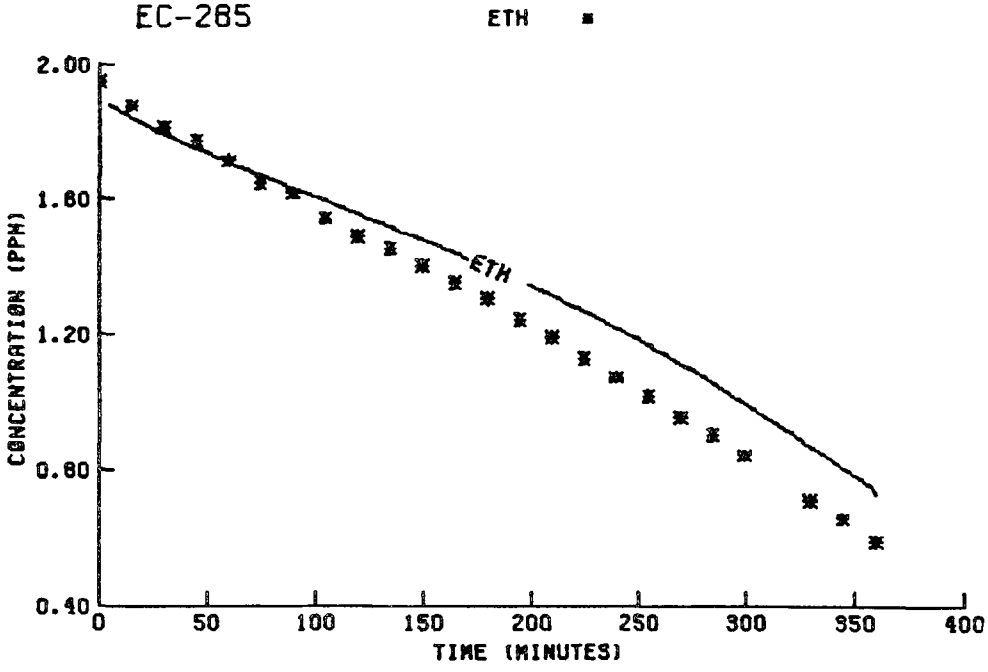

EC-156
NO2
NO
0.48
0.36
0.24
0.12
0.00
CONCENTRATION (PPM)
NO2
NO
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

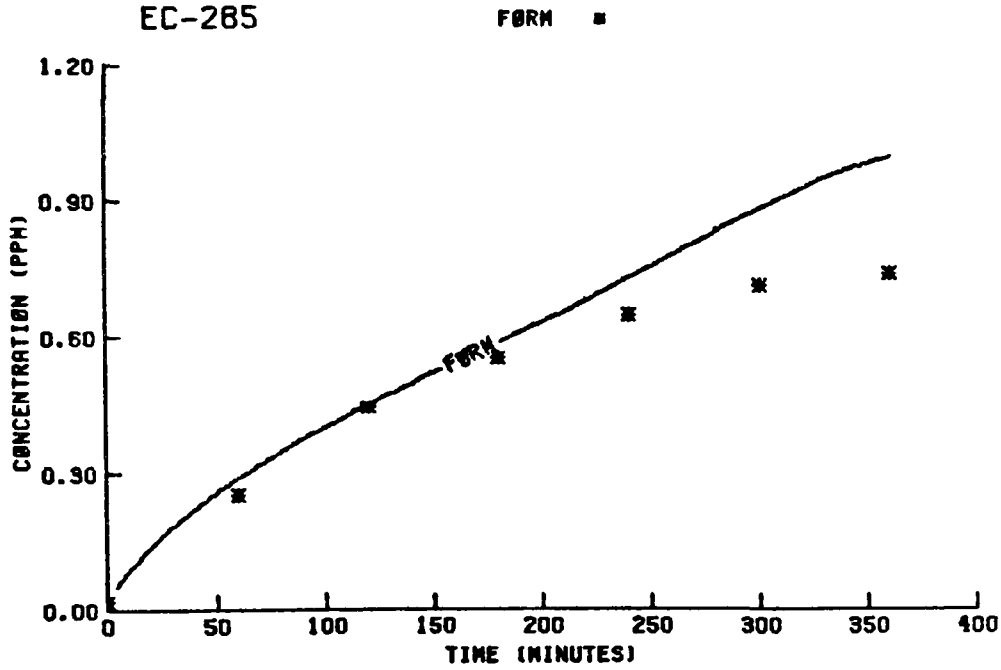

EC-156
ETH
2.00
1.50
1.00
0.50
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

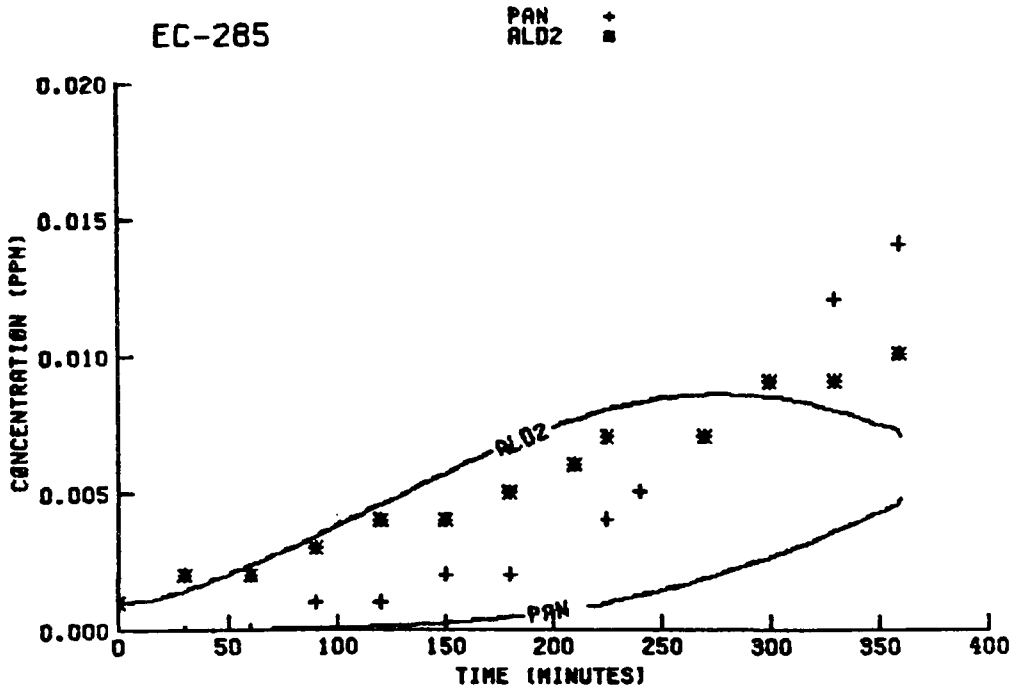

EC-156
ALD2
PAN
0.016
0.012
0.008
0.004
0.000
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

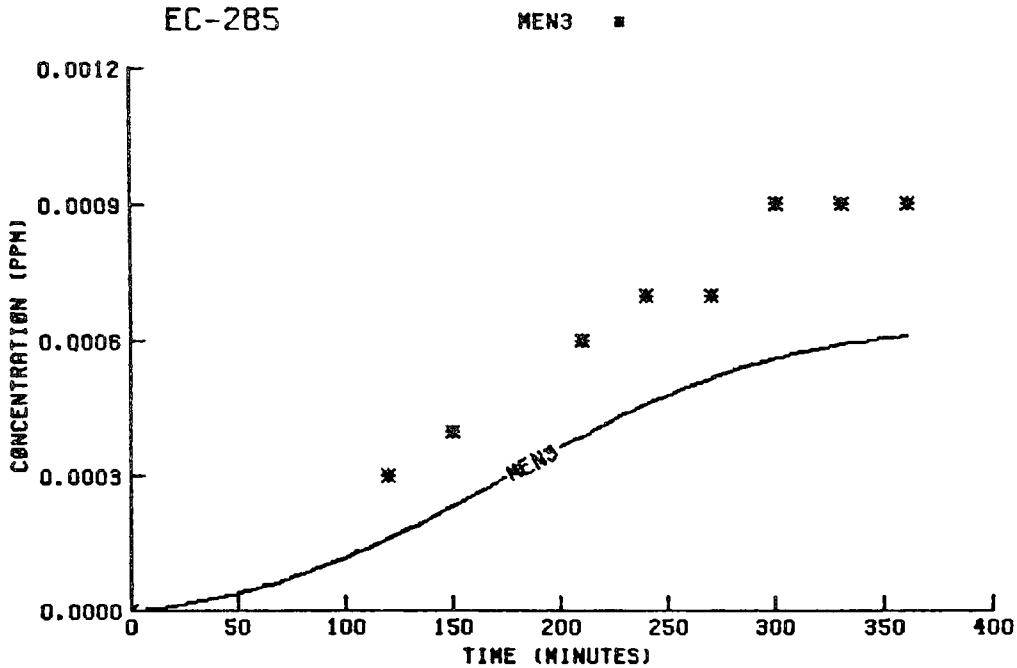

EC-156
FORM
1.20
0.90
0.60
0.90
0.00
CONCENTRATION (PPM)
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

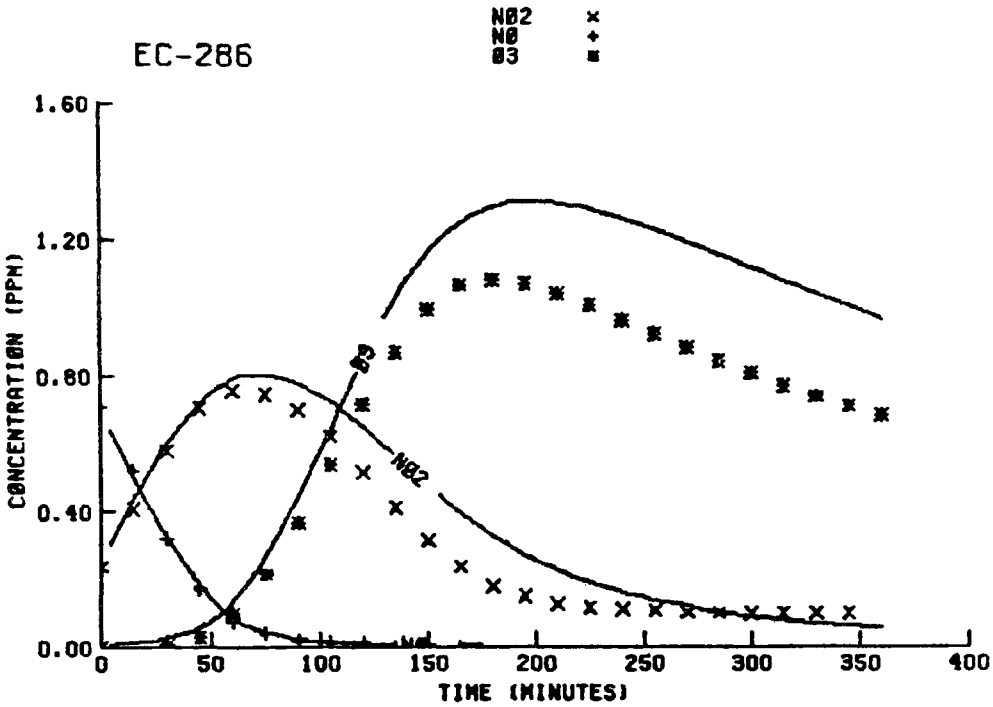

EC-285
NO2
NO
O3
1.00
0.75
0.50
0.25
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

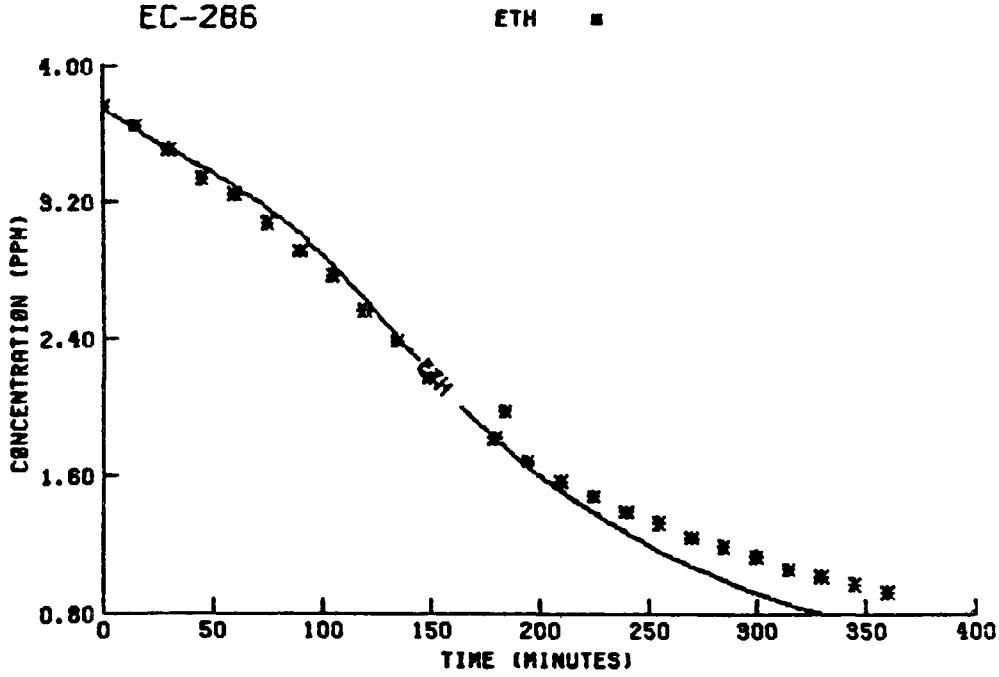

EC-285
ETH
2.00
1.60
1.20
0.80
0.40
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

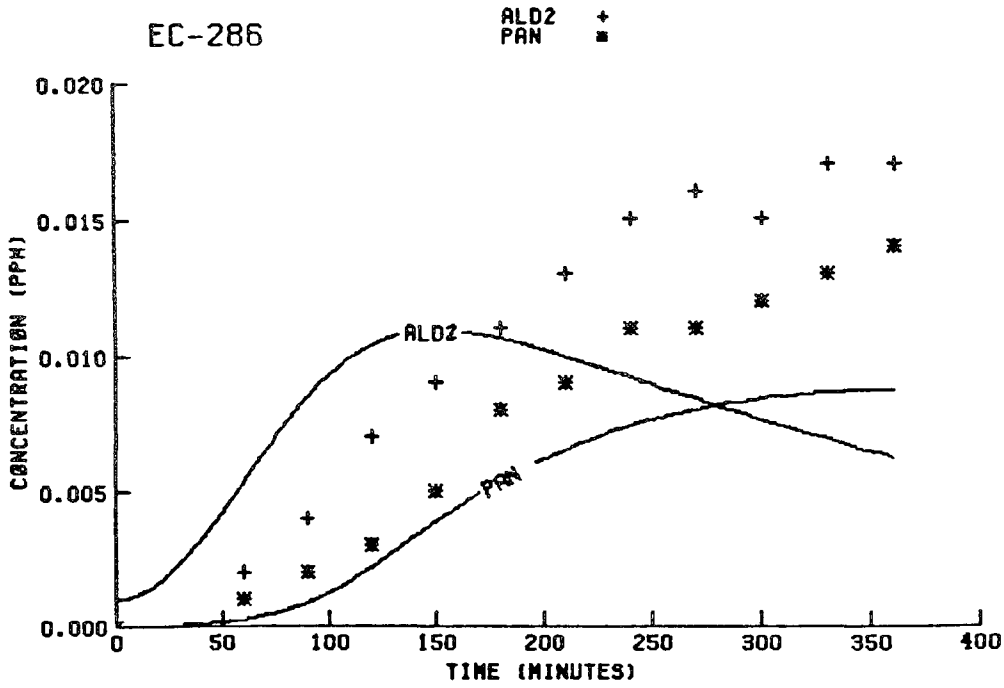

EC-285
FORM
1.20
0.90
0.60
0.30
0.00
CONCENTRATION (PPM)
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

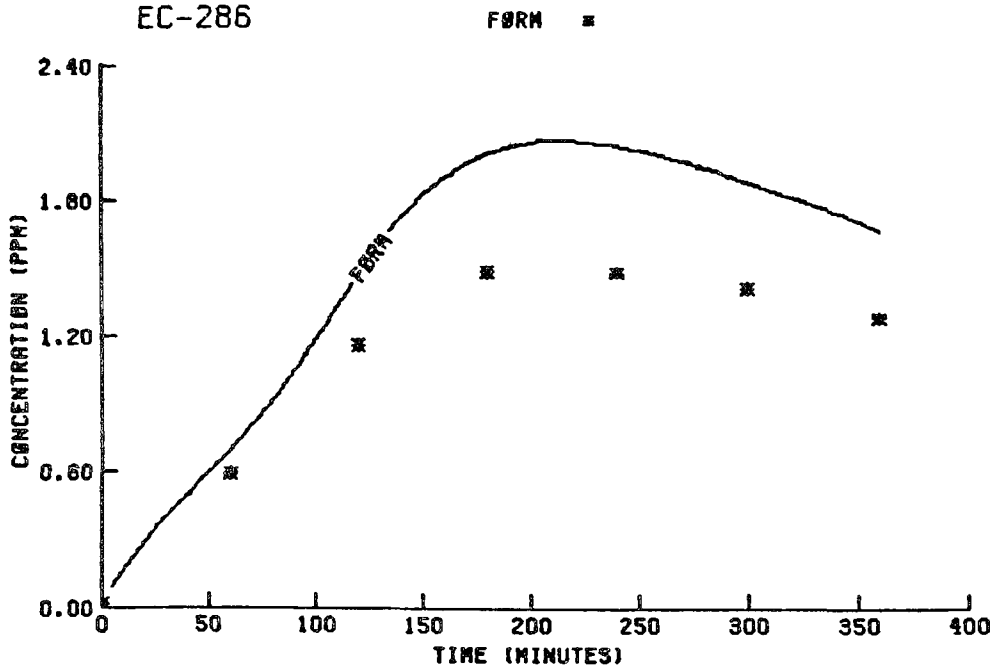

EC-285
PAN
ALD2
0.020
0.015
0.010
0.005
0.000
CONCENTRATION (PPM)
ALD2
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

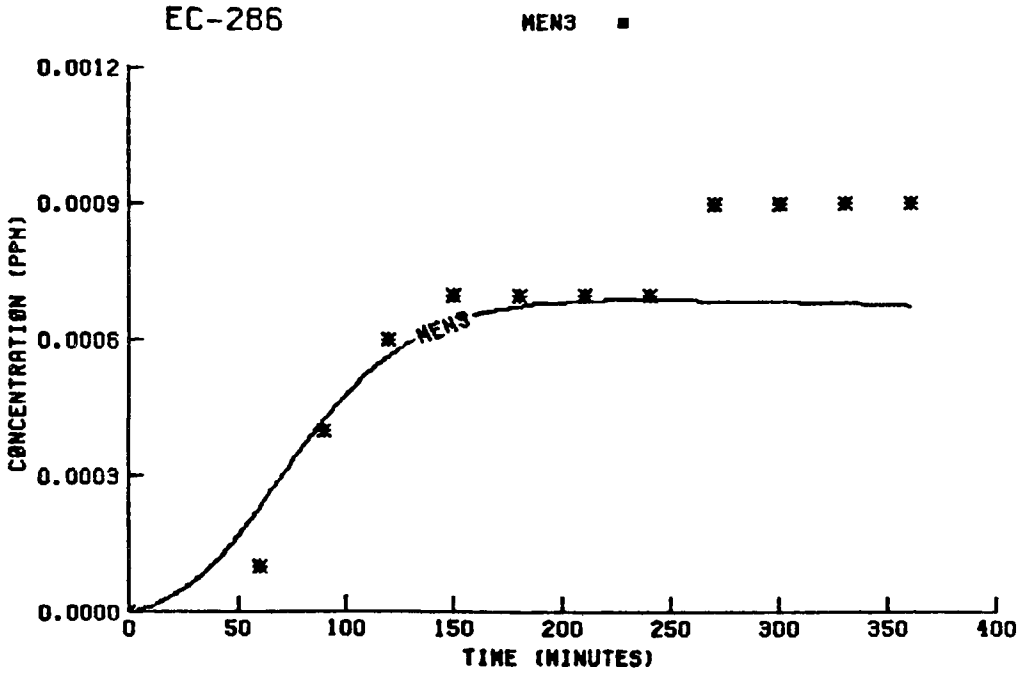

EC-285
MEN3
0.0012
0.0009
0.0006
0.0003
0.0000
CONCENTRATION (PPM)
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

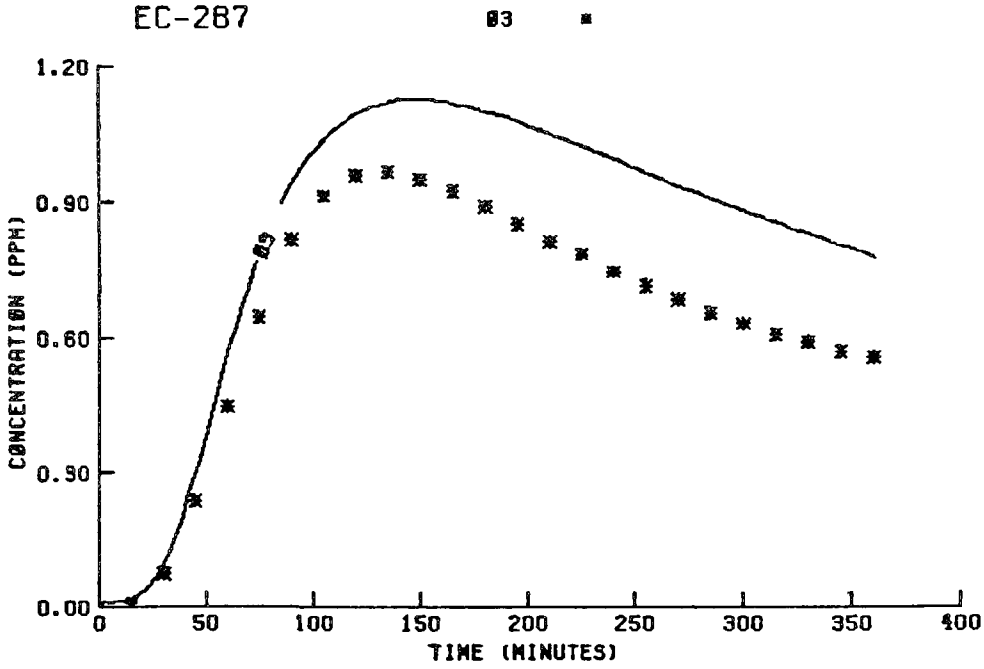

EC-286
NØ2 ×
NØ +
Ø3 ■
1.60
1.20
0.80
0.40
0.00
CØNCENTRATIØN (PPM)
Ø3
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

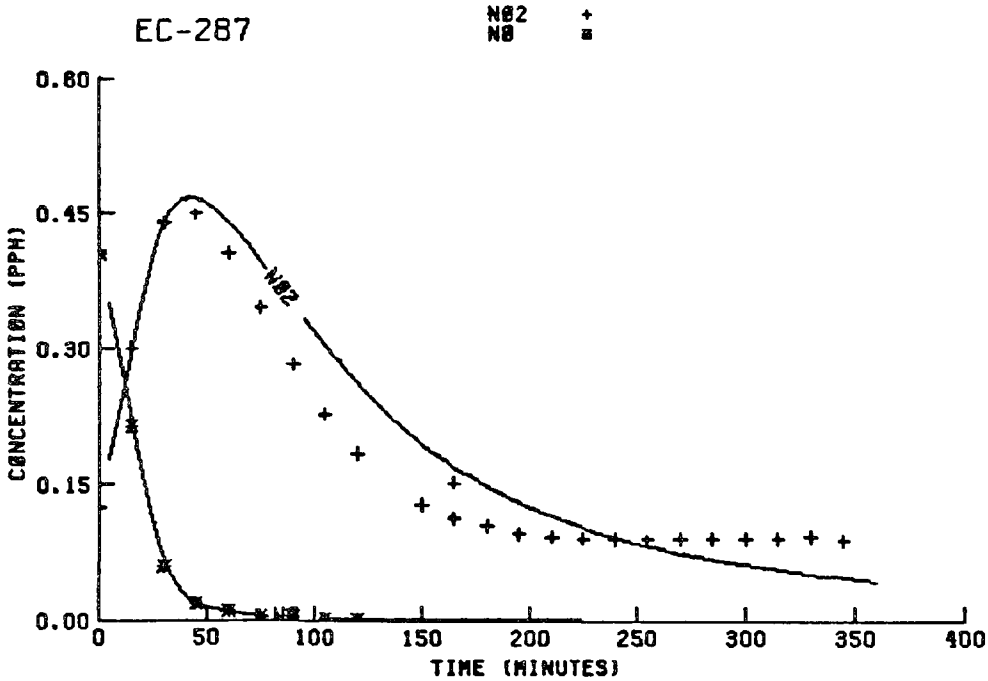

EC-286
ETH ■
4.00
3.20
2.40
1.60
0.80
CØNCENTRATIØN (PPM)
ETH
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

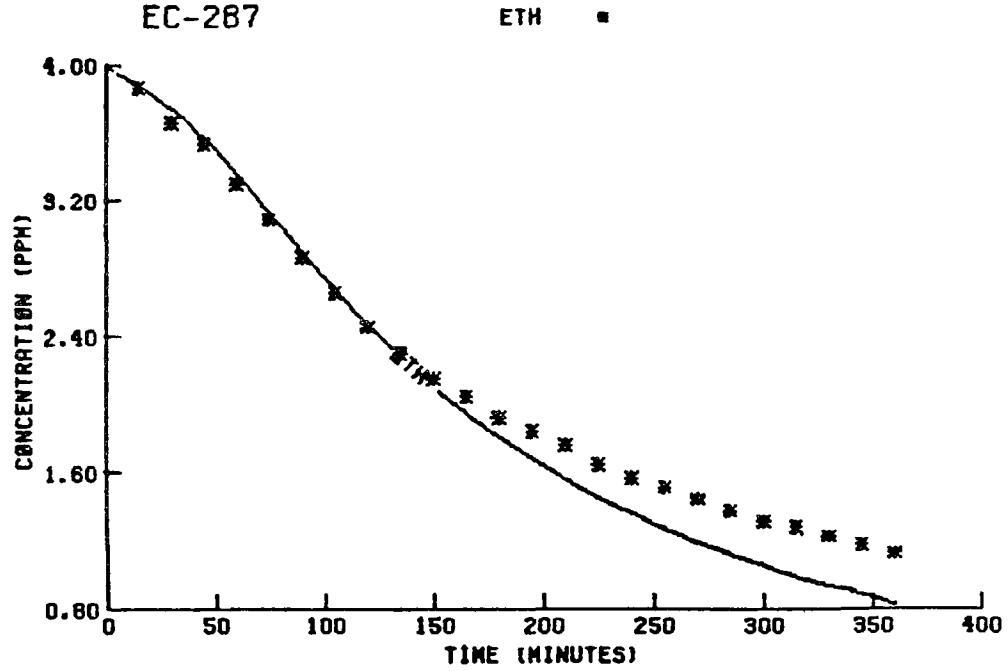

EC-286
ALD2 +
PAN ■
0.020
0.015
0.010
0.005
0.000
CONCENTRATION (PPM)
ALD2
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

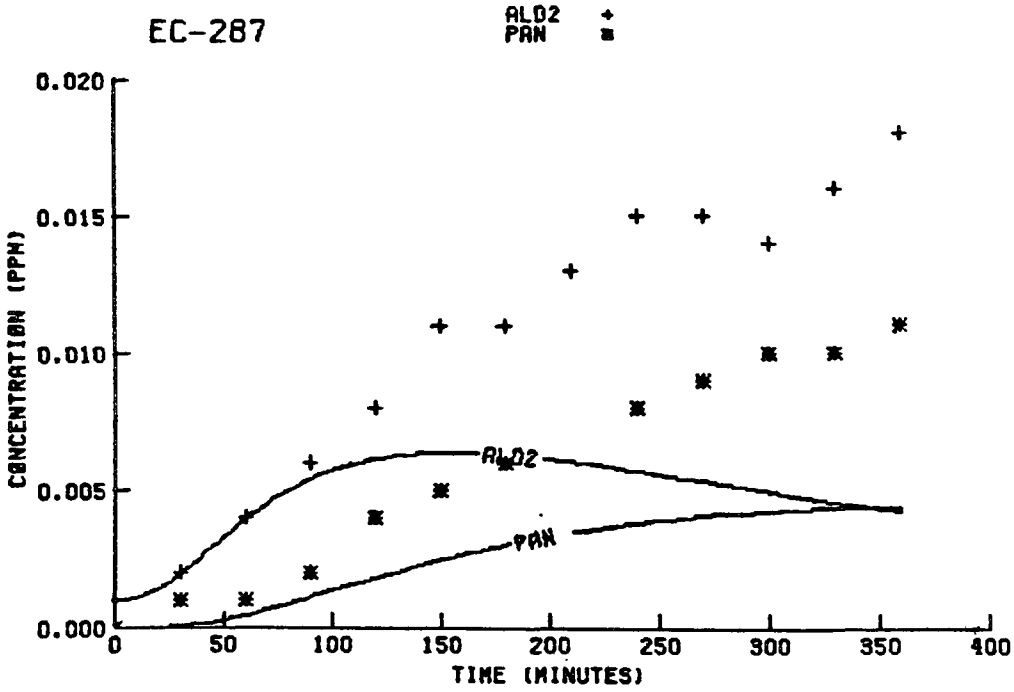

EC-286
FORM ■
2.40
1.80
1.20
0.60
0.00
CONCENTRATION (PPM)
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

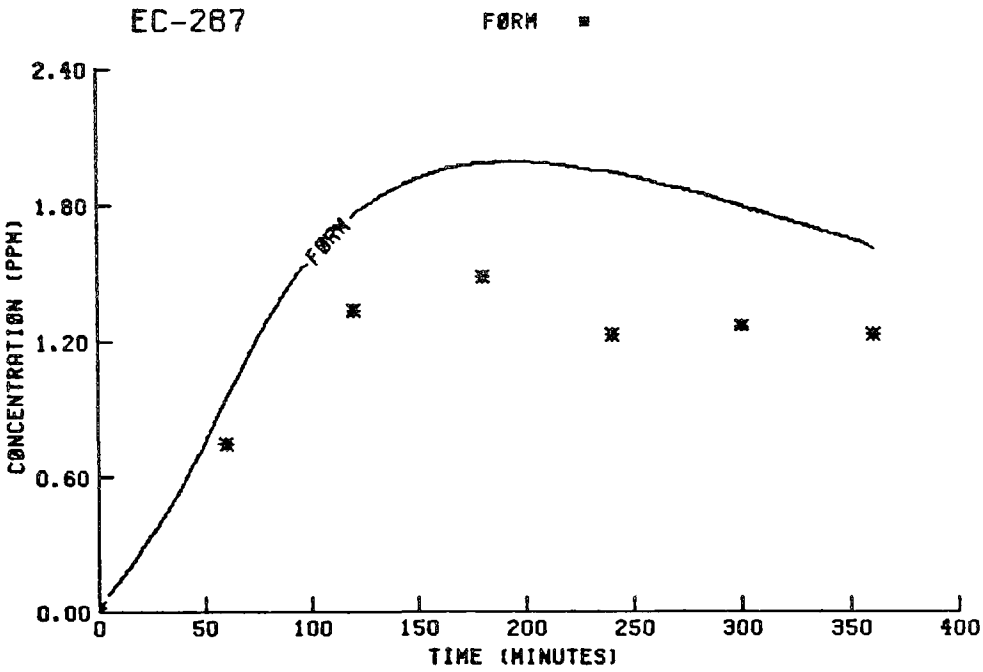

EC-286
MEN3
0.0012
0.0009
0.0006
0.0003
0.0000
CONCENTRATION (PPM)
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-287
03
1.20
0.90
0.60
0.30
0.00
CONCENTRATION (PPM)
03
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

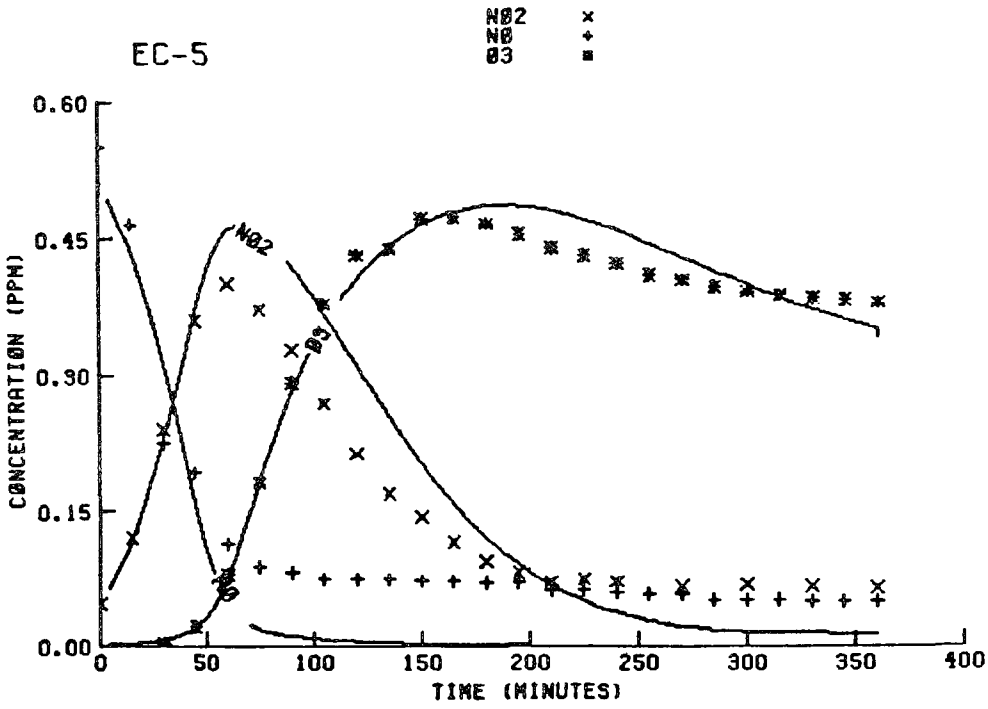

EC-287
NO2
NO
0.60
0.45
0.30
0.15
0.00
CONCENTRATION (PPM)
NO2
NO
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

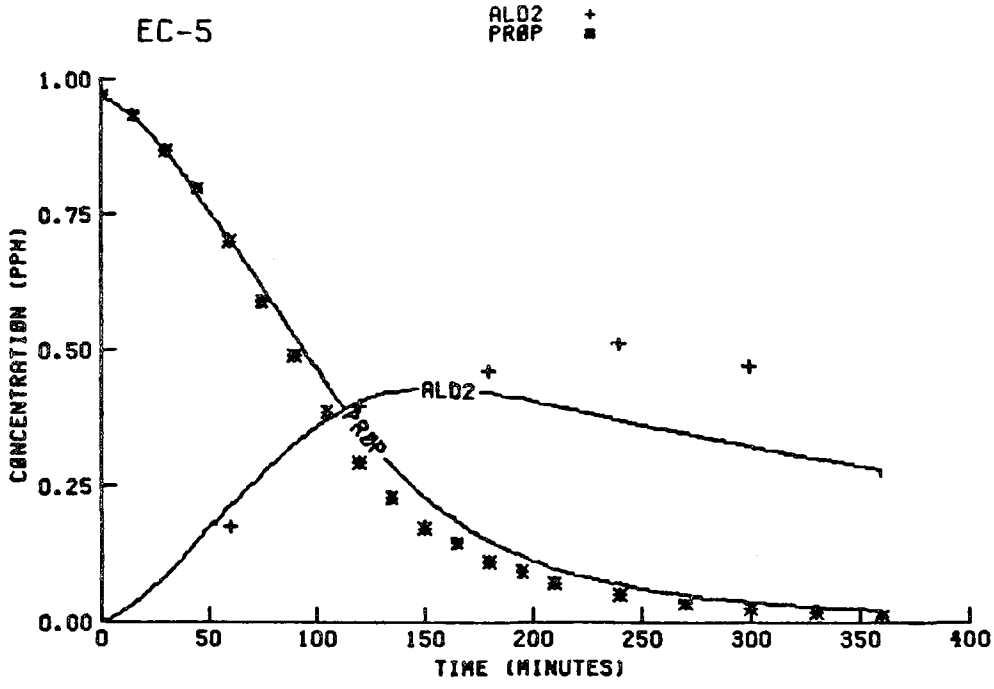

EC-287
ETH
4.00
3.20
2.40
1.60
0.80
CONCENTRATION (PPM)
ETH
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

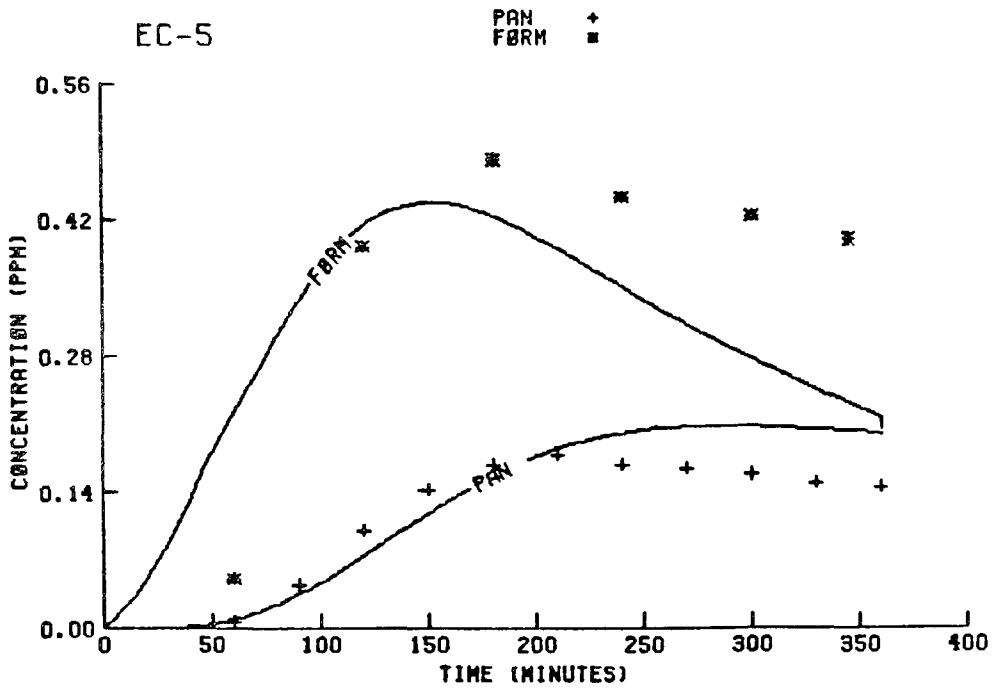

EC-287
ALD2
PAN
0.020
0.015
0.010
0.005
0.000
CONCENTRATION (PPM)
ALD2
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

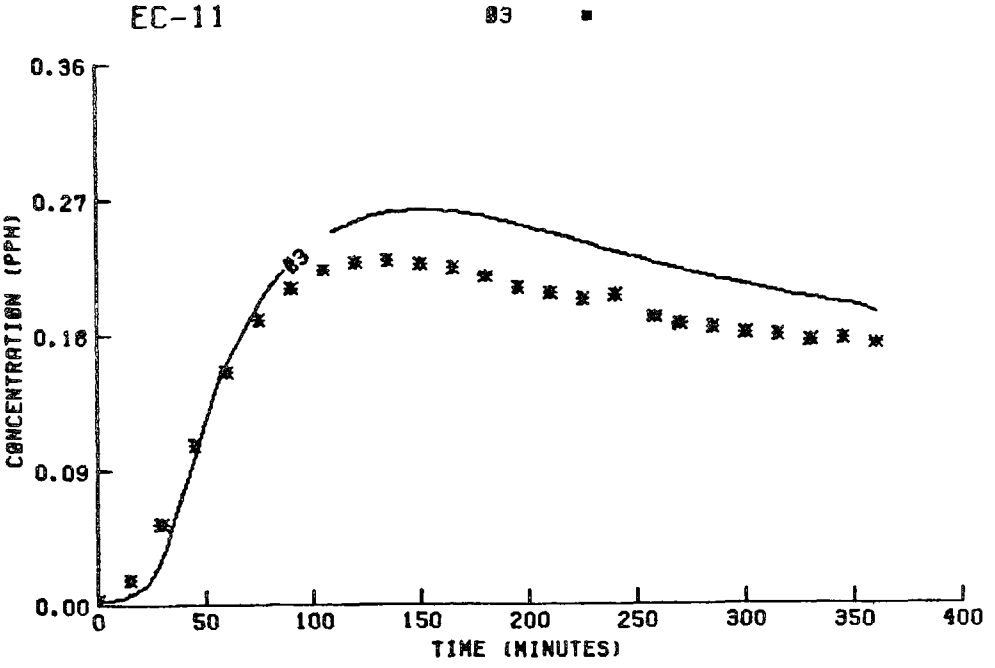

EC-287
FØRM
2.40
1.80
1.20
0.60
0.00
CØNCENTRATIØN (PPM)
FØRM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

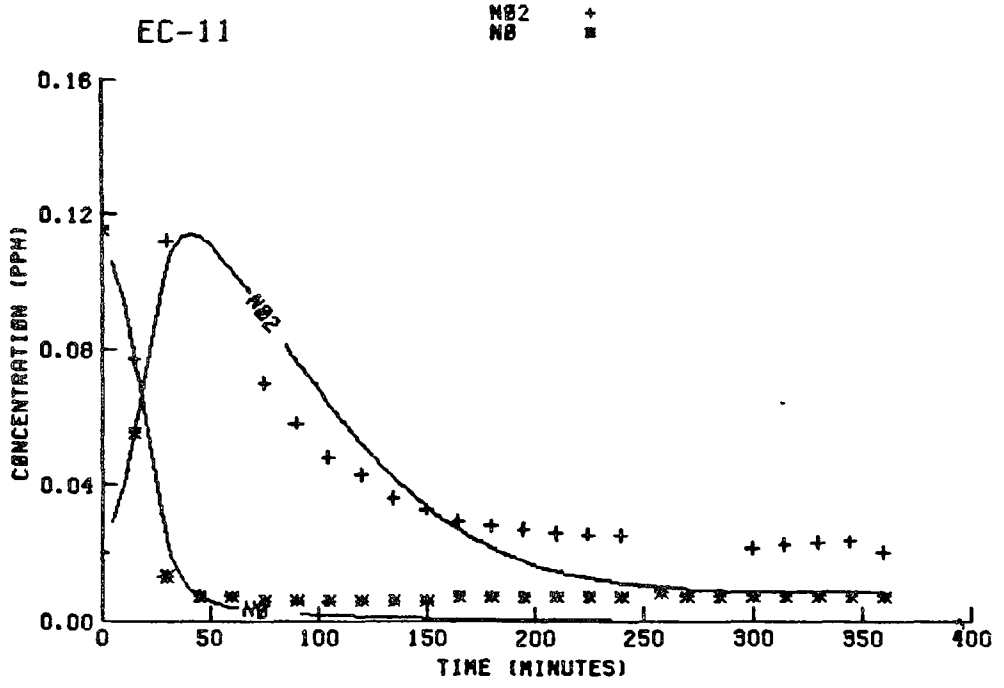
UCR PROPYLENE EXPERIMENTS

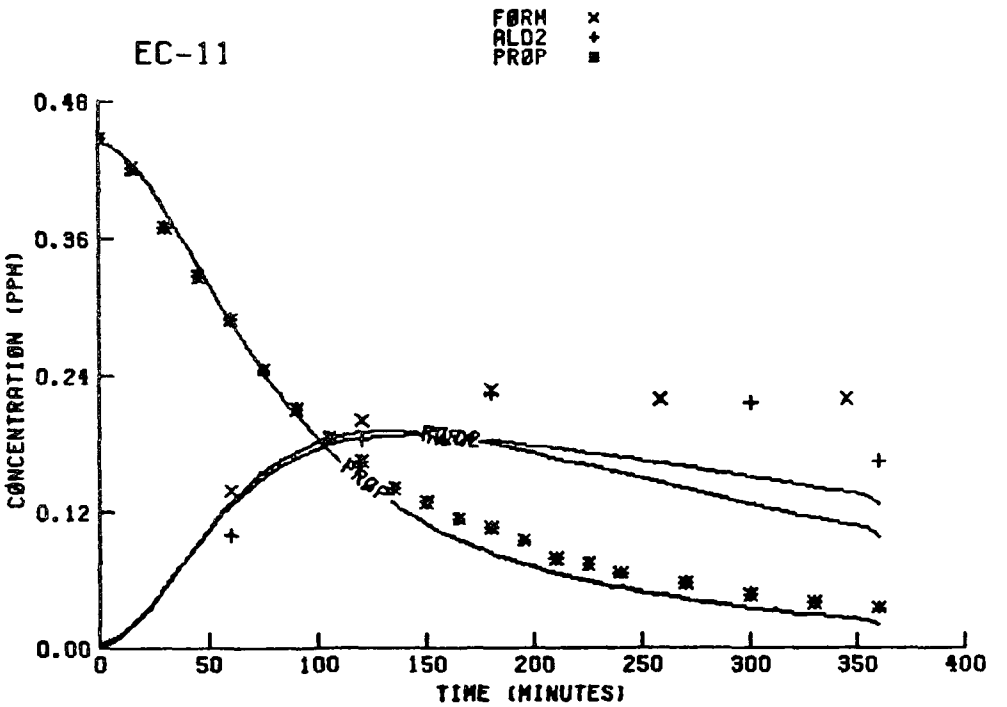

EC-5
NØ2
NØ
Ø3
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

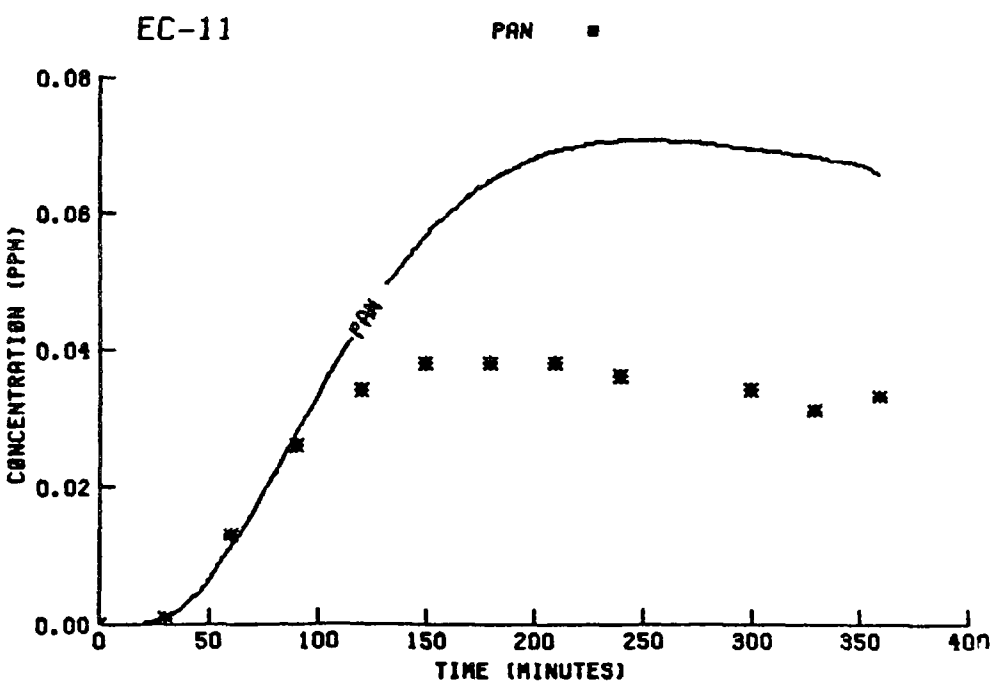

EC-5
ALD2
PRØP
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

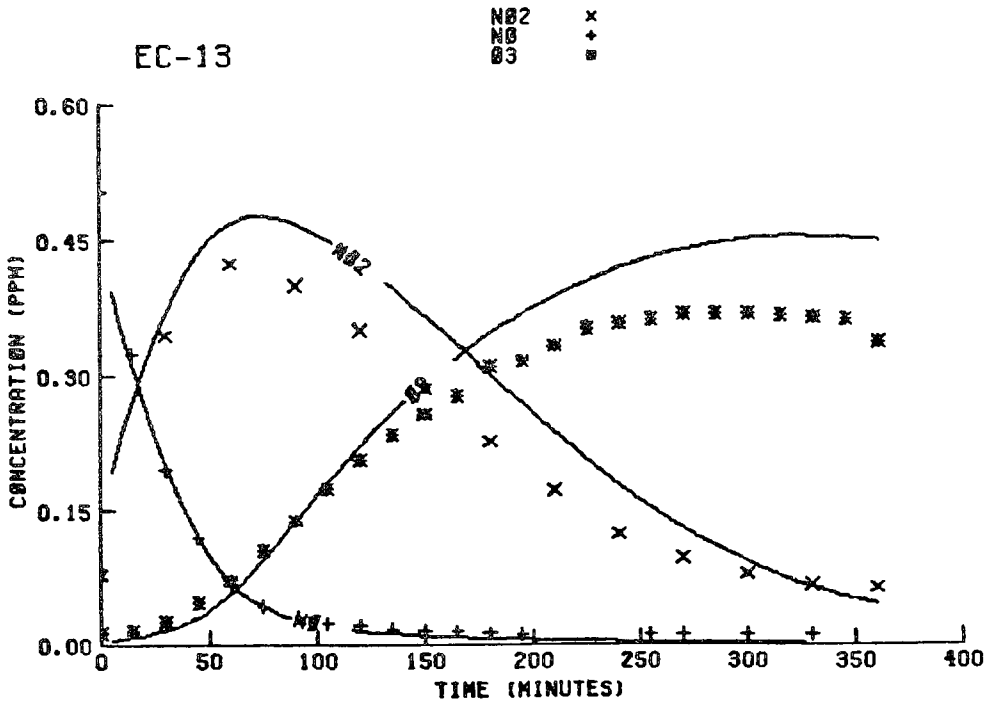

EC-5
PAN
FØRM
0.56
0.42
0.28
0.14
0.00
CØNCENTRATIØN (PPM)
FØRM
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

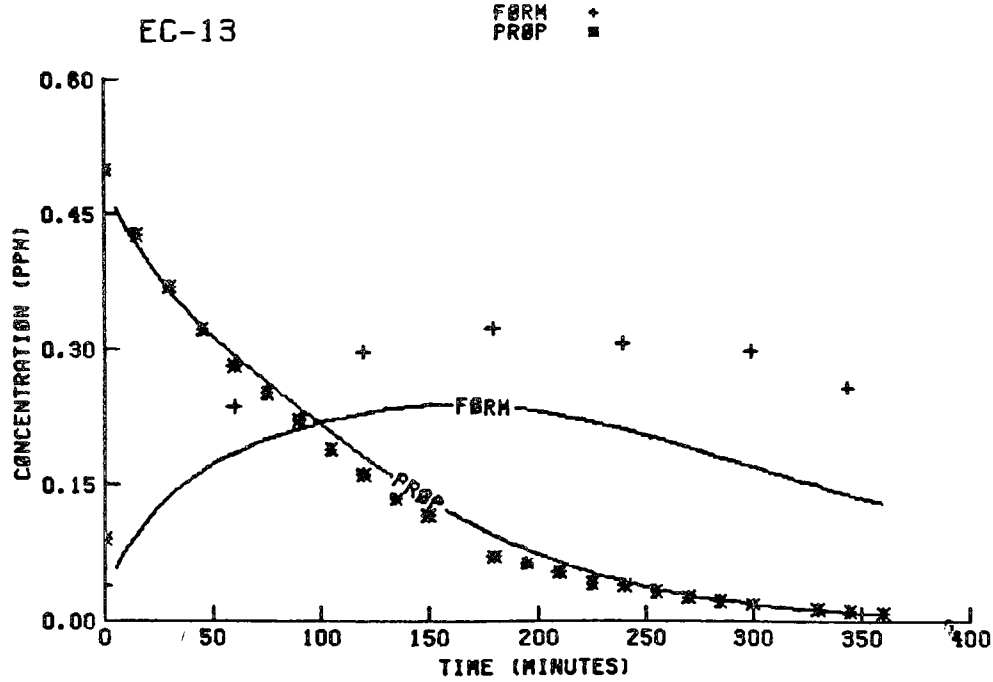

EC-11
O3
0.36
0.27
0.18
0.09
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

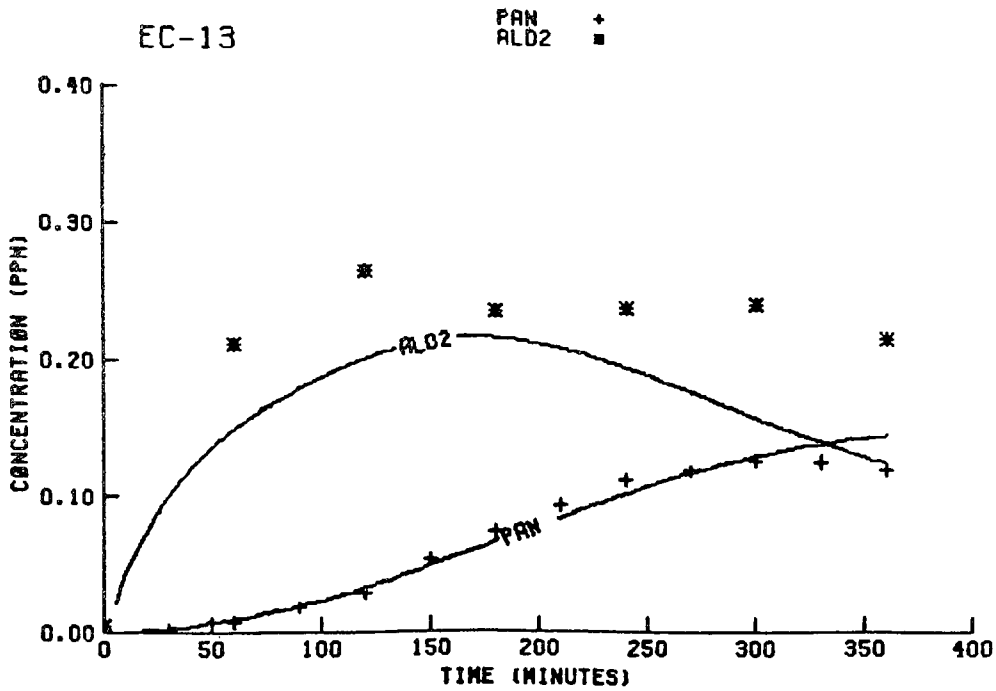

EC-11
NO2
NO
0.16
0.12
0.08
0.04
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

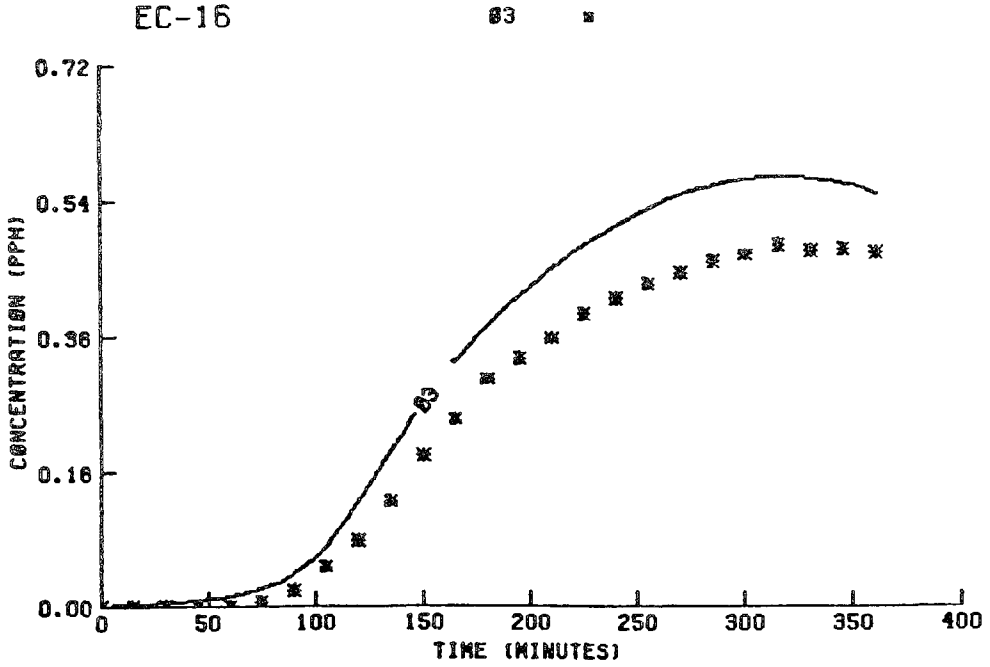

EC-11
FØRM ×
ALD2 +
PRØP ■
0.48
0.36
0.24
0.12
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

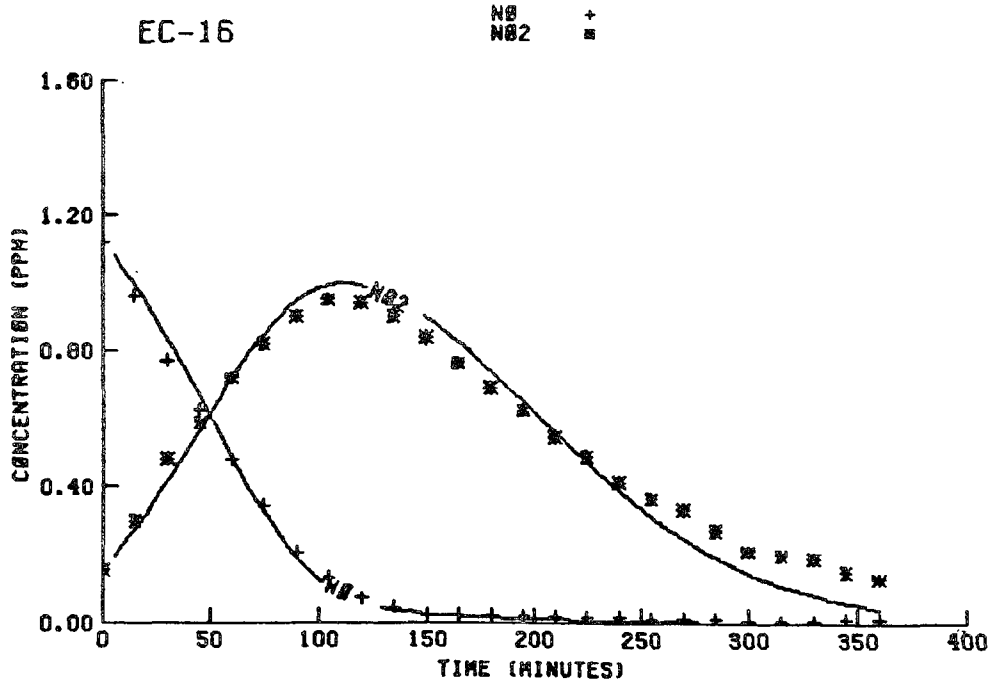

EC-11
PAN ■
0.08
0.06
0.04
0.02
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

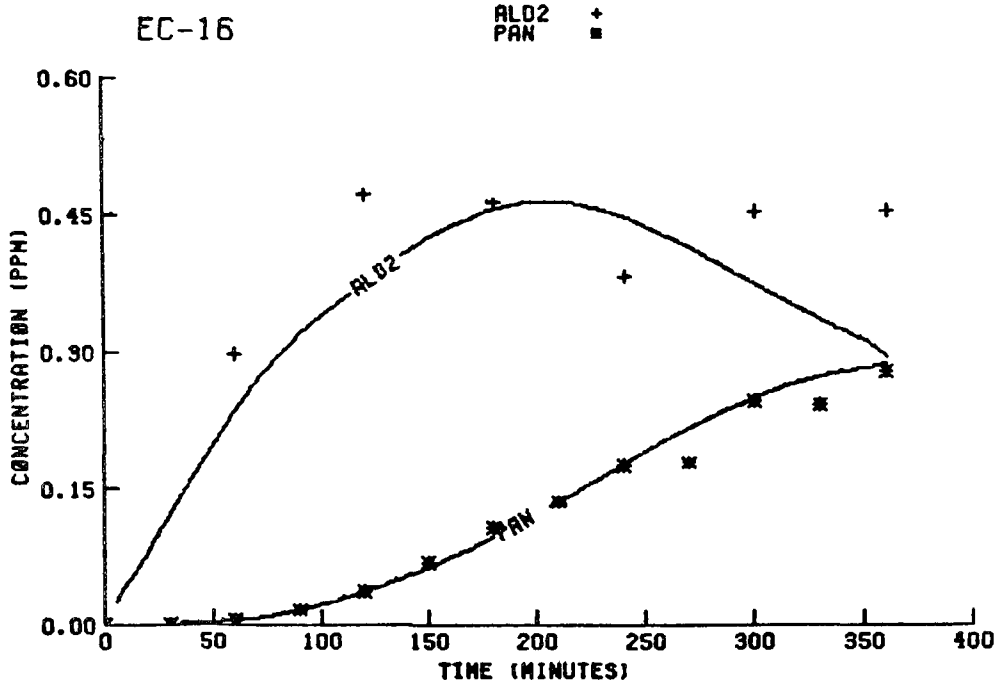

EC-13
NØ2
NØ
Ø3
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

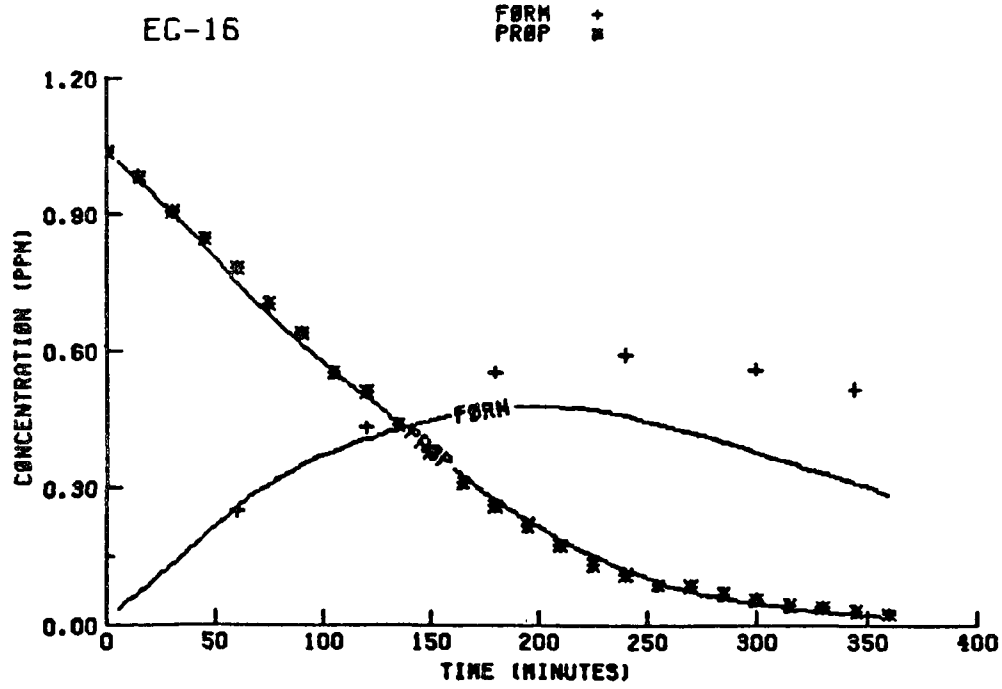

EC-13
FØRM
PRØP
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

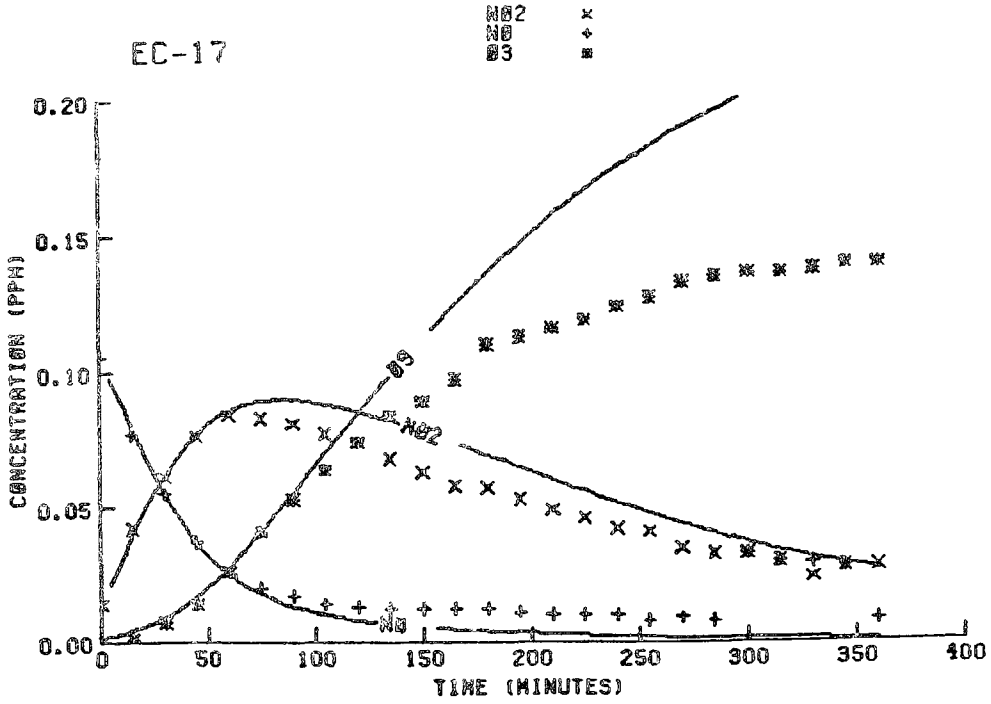

EC-13
PAN +
ALD2 ■
0.40
0.30
0.20
0.10
0.00
CONCENTRATION (PPM)
ALD2
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

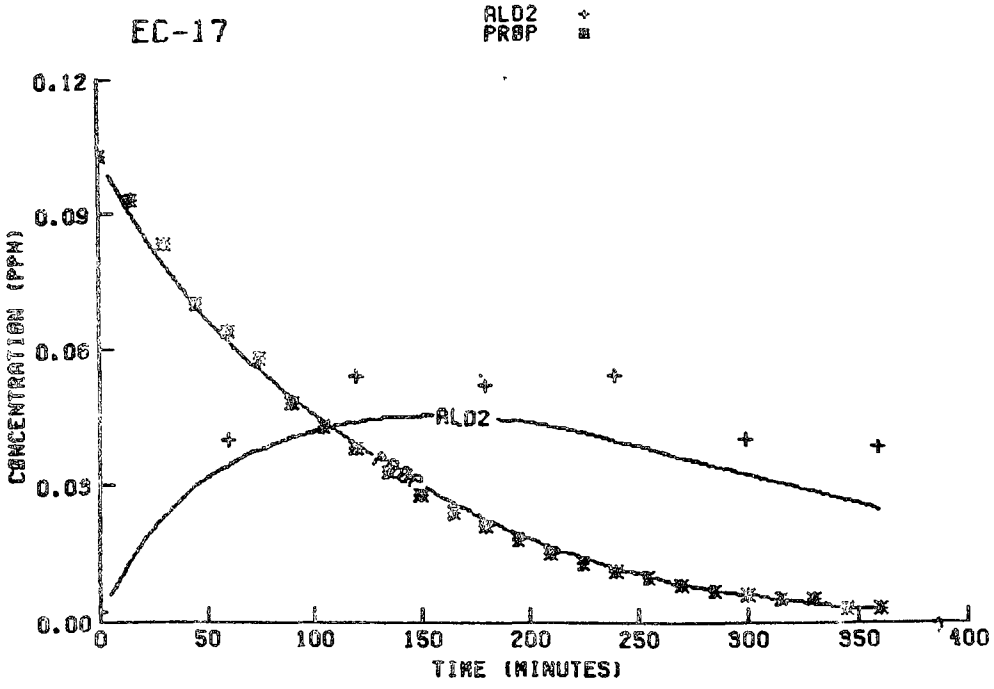

EC-16
O3
0.72
0.54
0.36
0.16
0.00
CONCENTRATION (PPM)
O3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

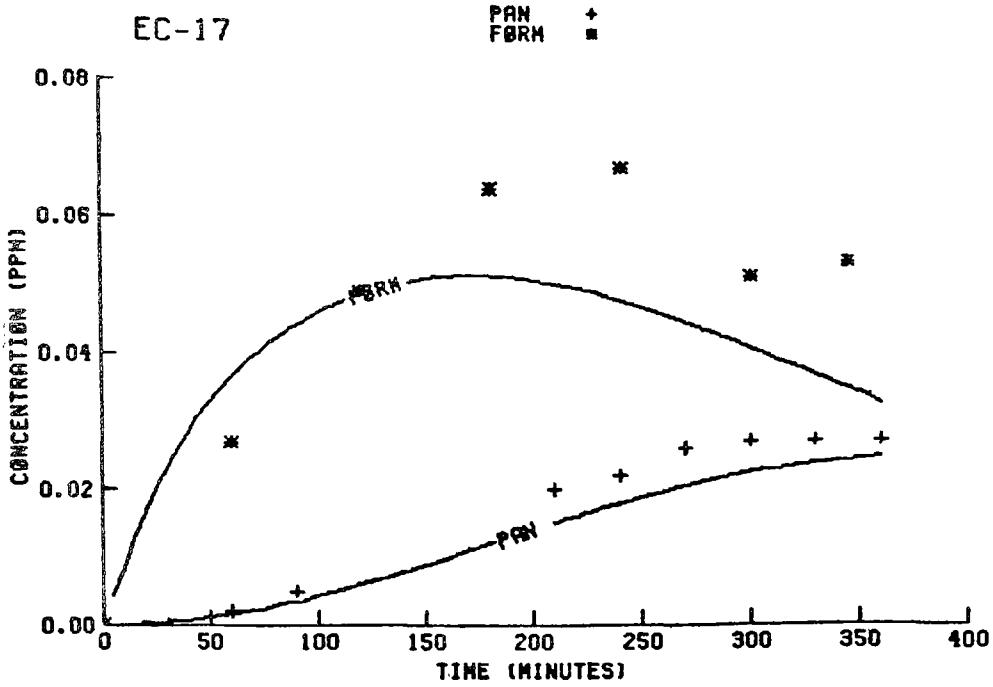

EC-16
NO
NO2
1.60
1.20
0.80
0.40
0.00
CONCENTRATION (PPM)
NO2
NO
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

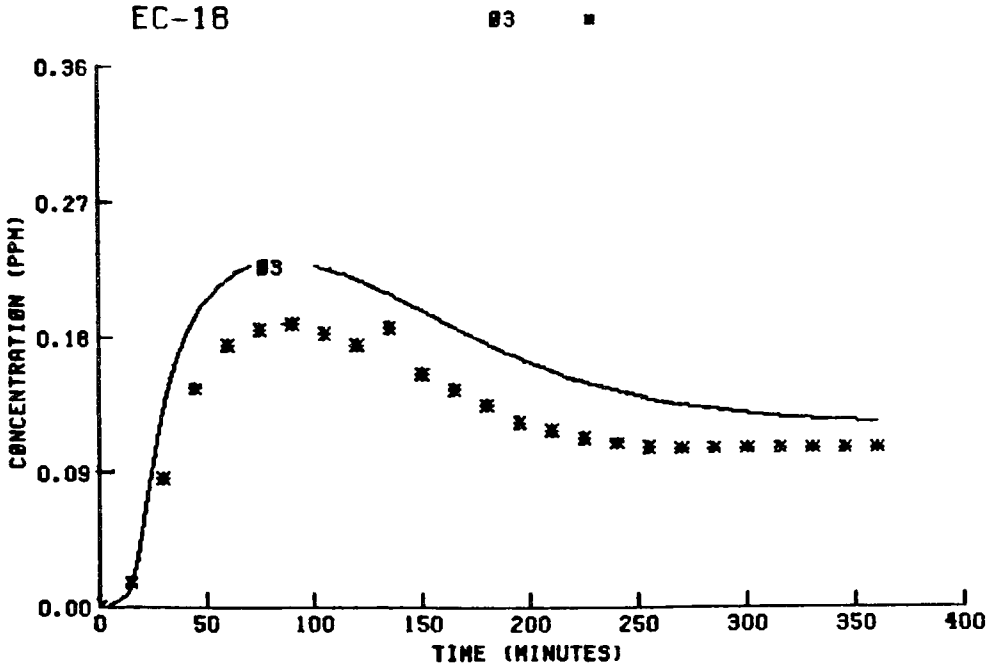

EC-16
ALD2 +
PAN ■
0.60
0.45
0.30
0.15
0.00
CONCENTRATION (PPM)
ALD2
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

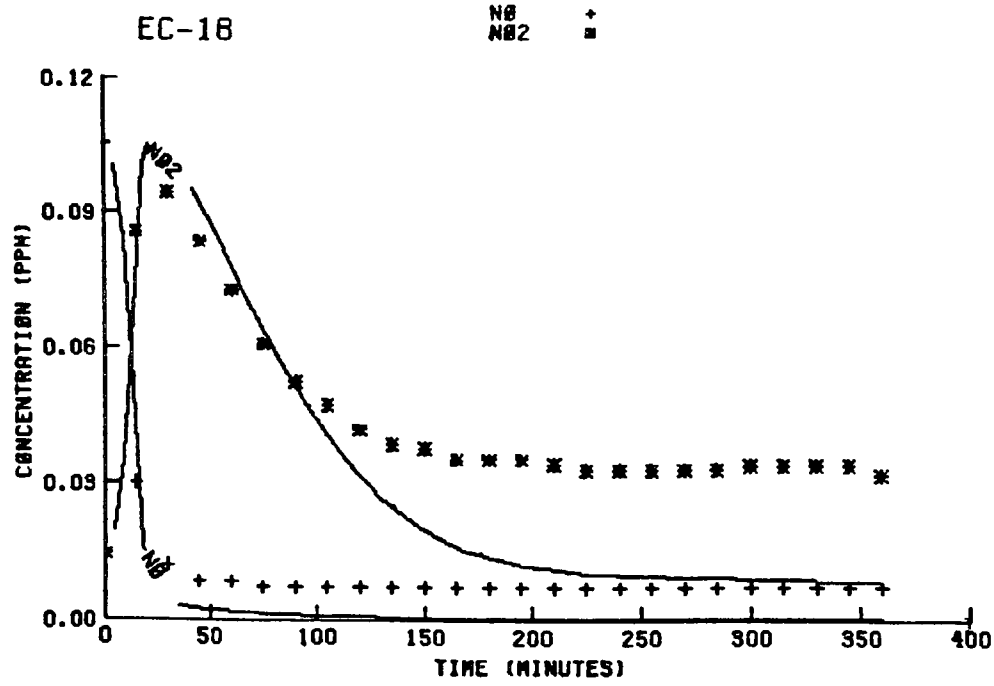

EC-16
FORM +
PROP ■
1.20
0.90
0.60
0.30
0.00
CONCENTRATION (PPM)
FORM
PROP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

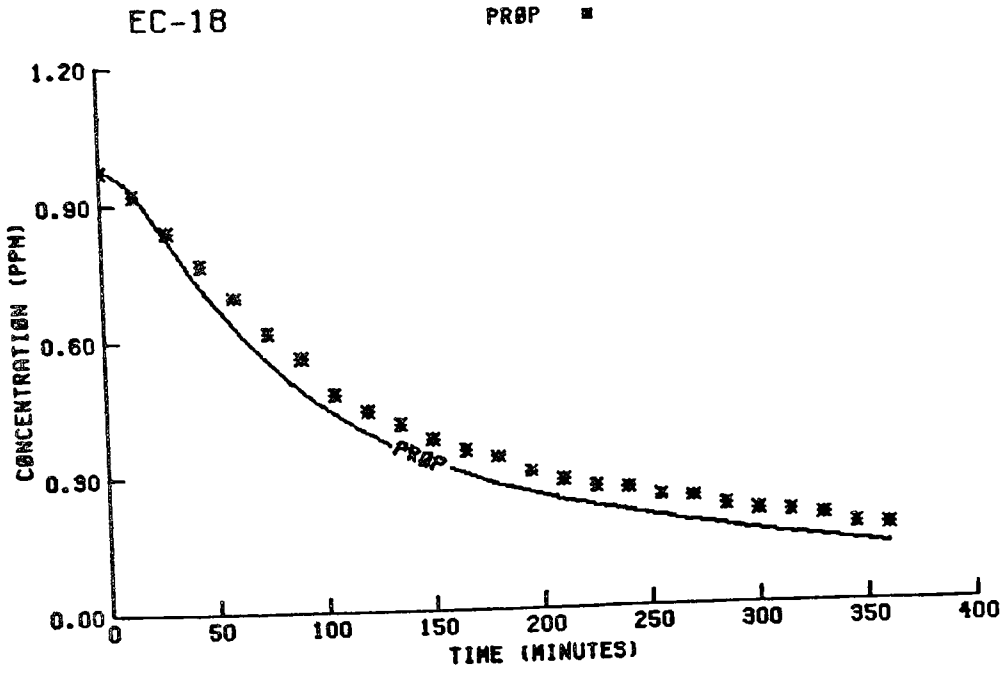

EC-17
NO2
NO
O3
0.20
0.15
0.10
0.05
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
O3
NO2
NO

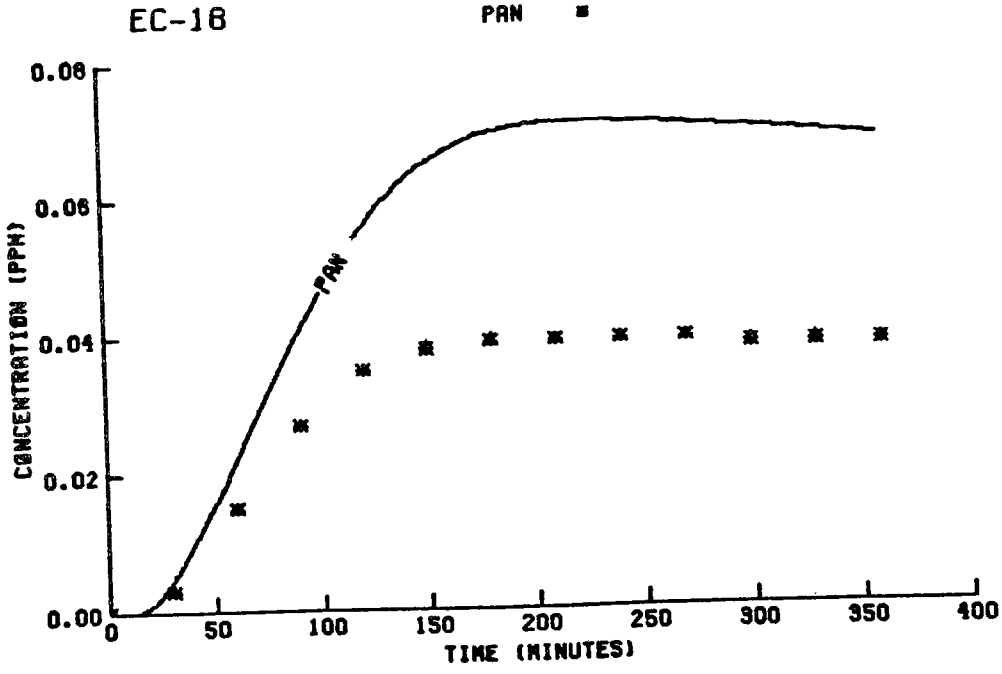

EC-17
ALD2
PROP
0.12
0.09
0.06
0.03
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
ALD2
PROP

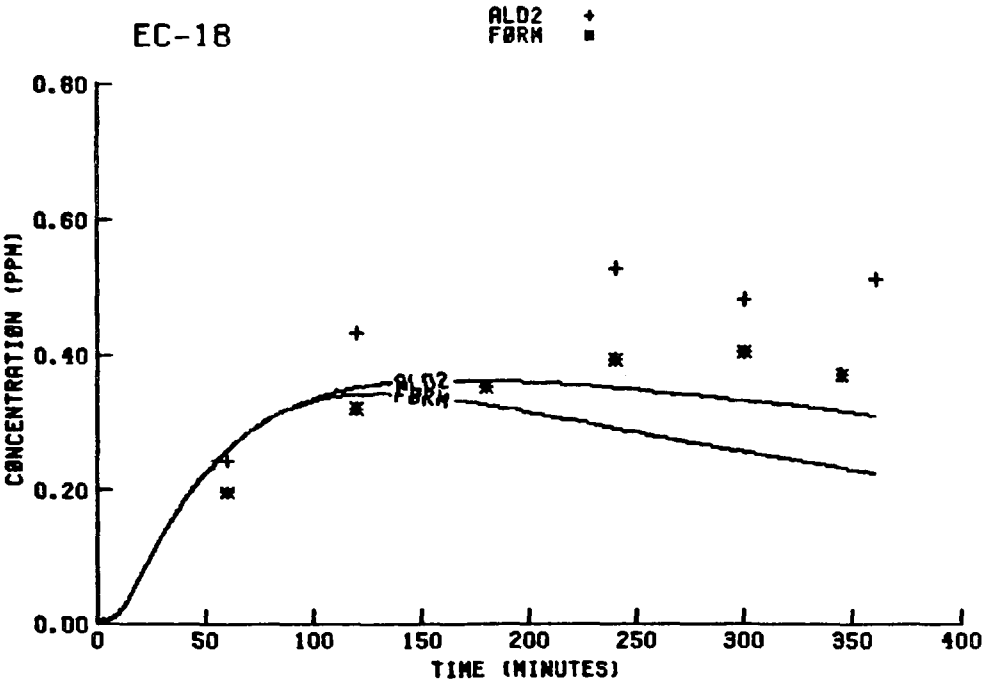

EC-17
PAN +
FORM ■
0.08
0.06
0.04
0.02
0.00
CONCENTRATION (PPM)
FORM
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

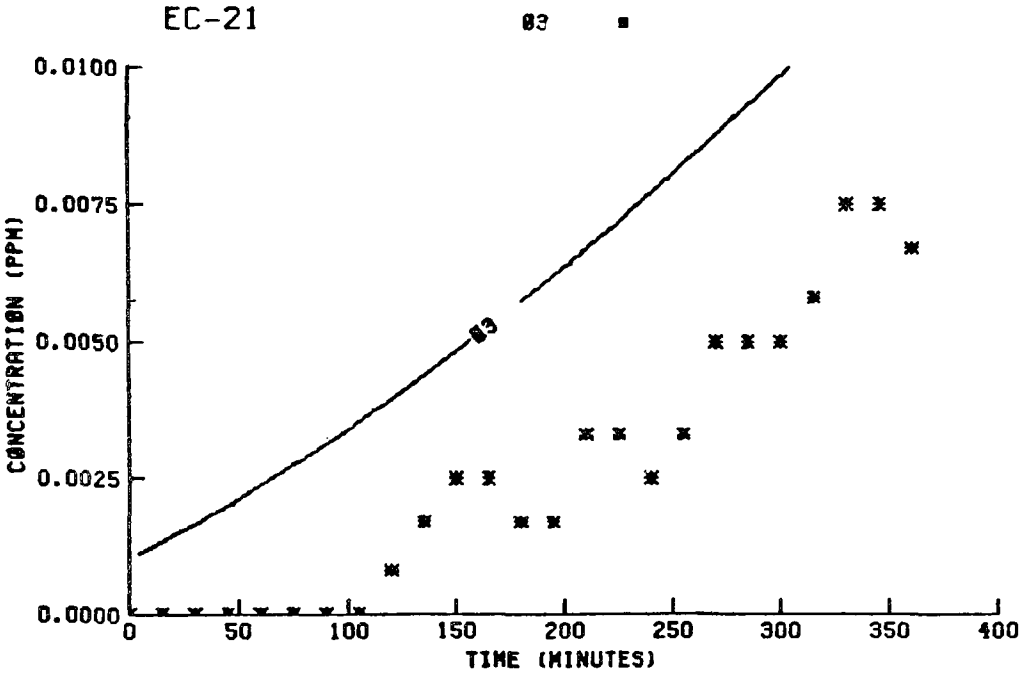

EC-18
03
0.36
0.27
0.18
0.09
0.00
CONCENTRATION (PPM)
03
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

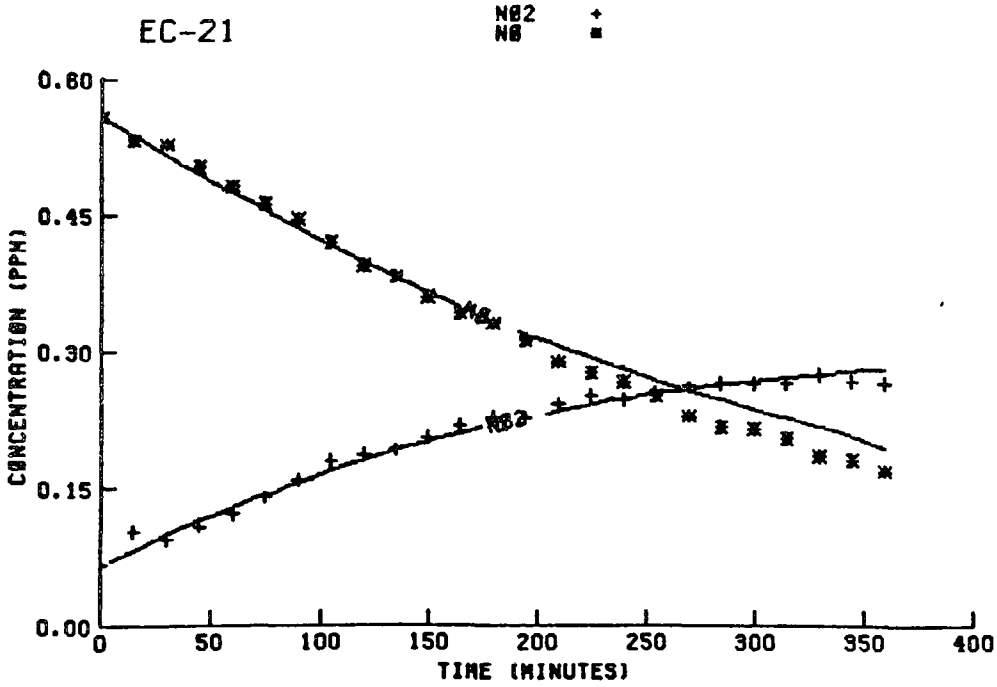

EC-18
NO
NO2
0.12
0.09
0.06
0.03
0.00
CONCENTRATION (PPM)
NO2
NO
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

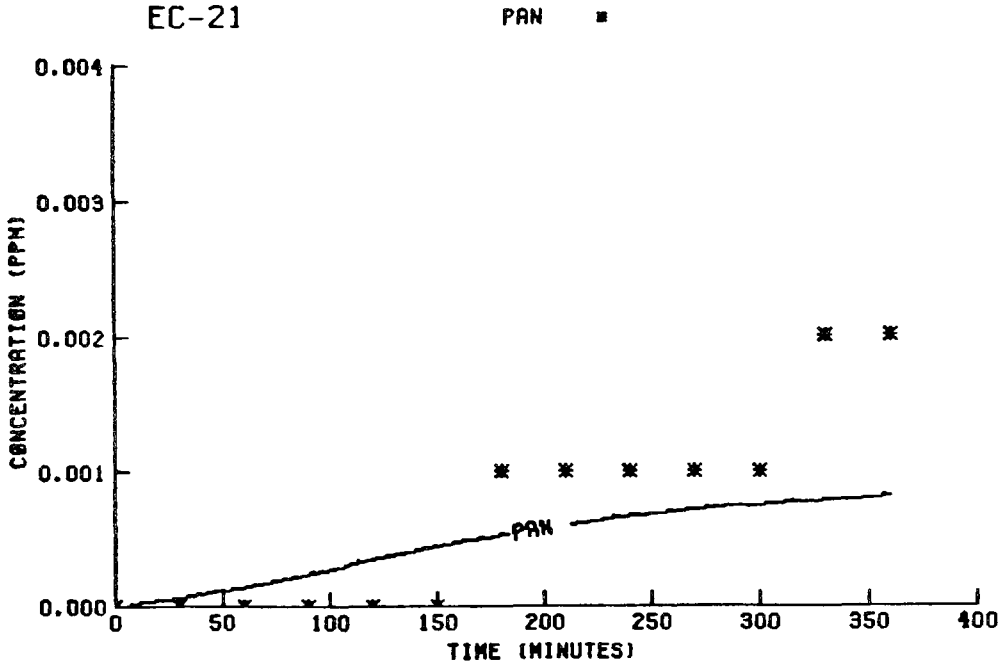

EC-18
PROP
1.20
0.90
0.60
0.30
0.00
CONCENTRATION (PPM)
PROP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

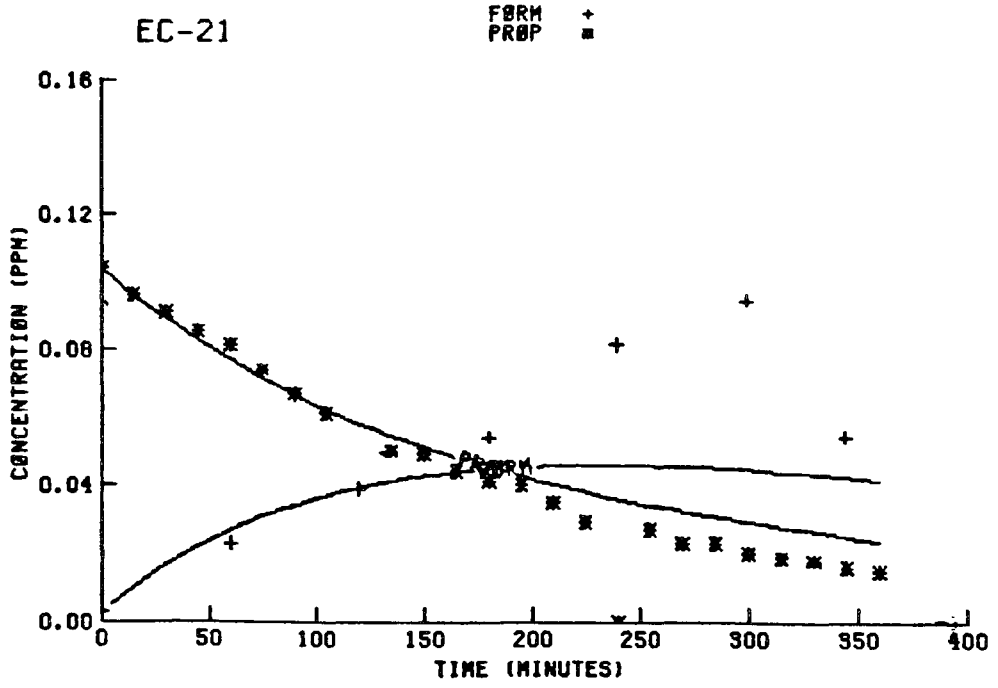

EC-18
PAN
0.08
0.06
0.04
0.02
0.00
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

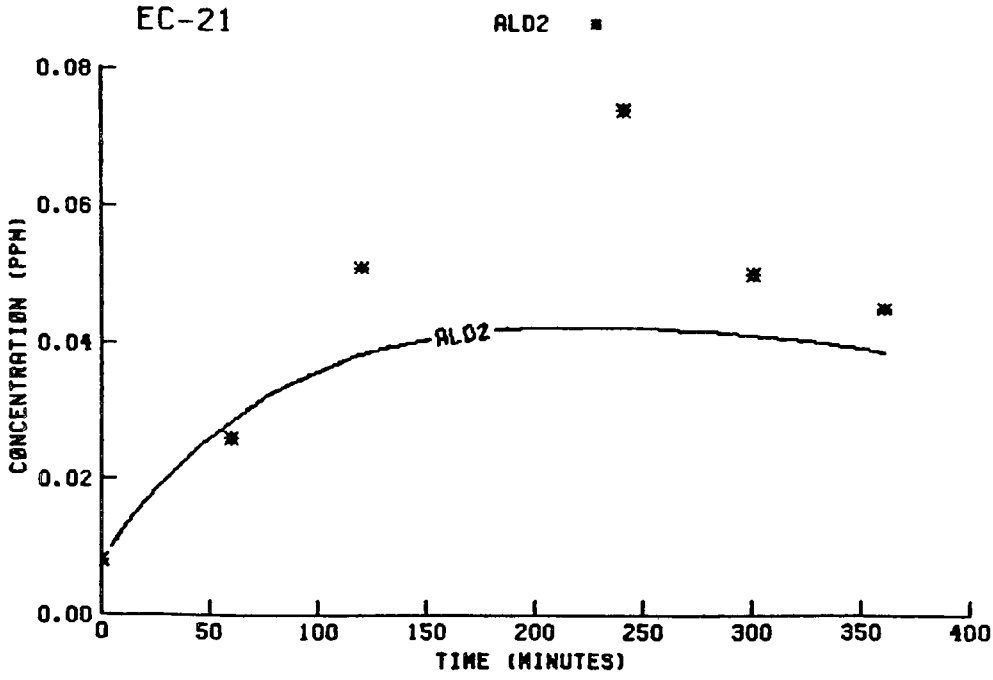

EC-18
ALD2
FORM
0.80
0.60
0.40
0.20
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

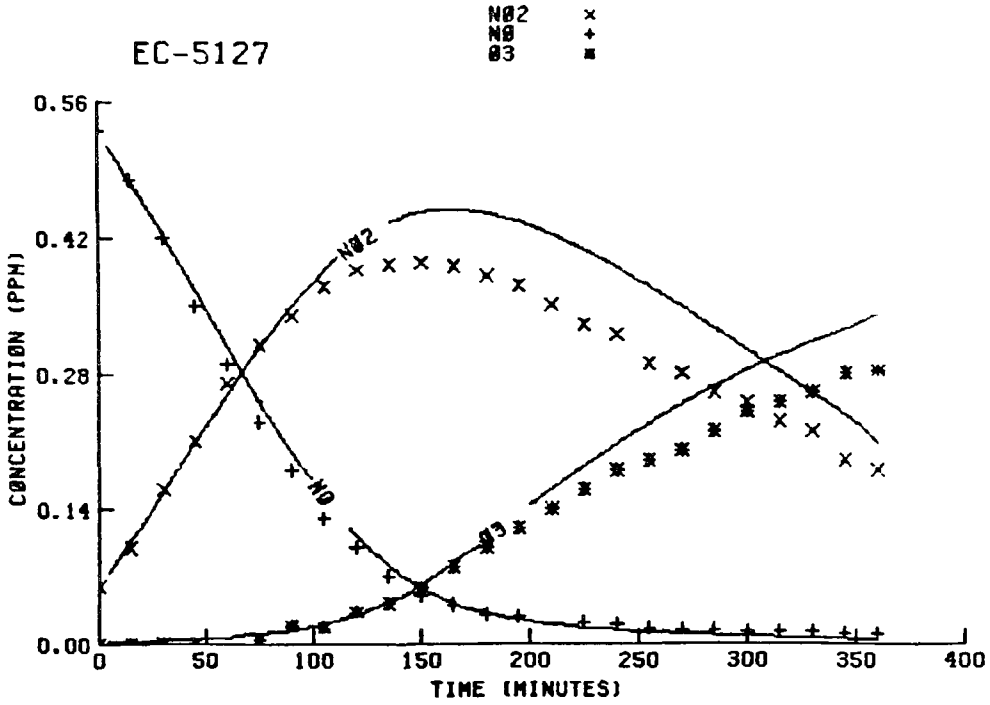

EC-21
03
0.0100
0.0075
0.0050
0.0025
0.0000
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

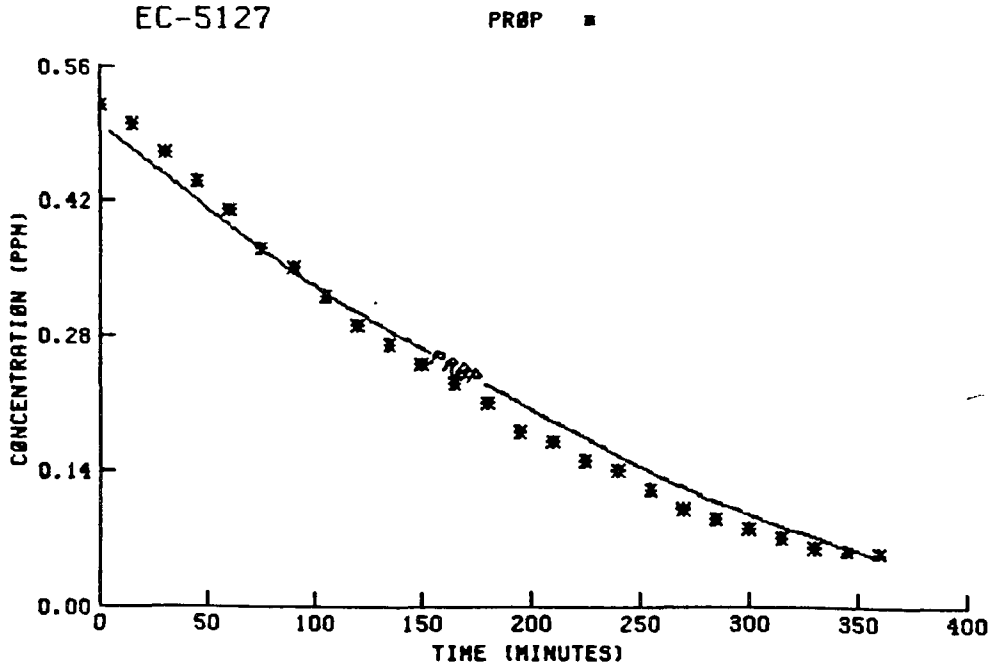

EC-21
NO2
NO
0.60
0.45
0.30
0.15
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

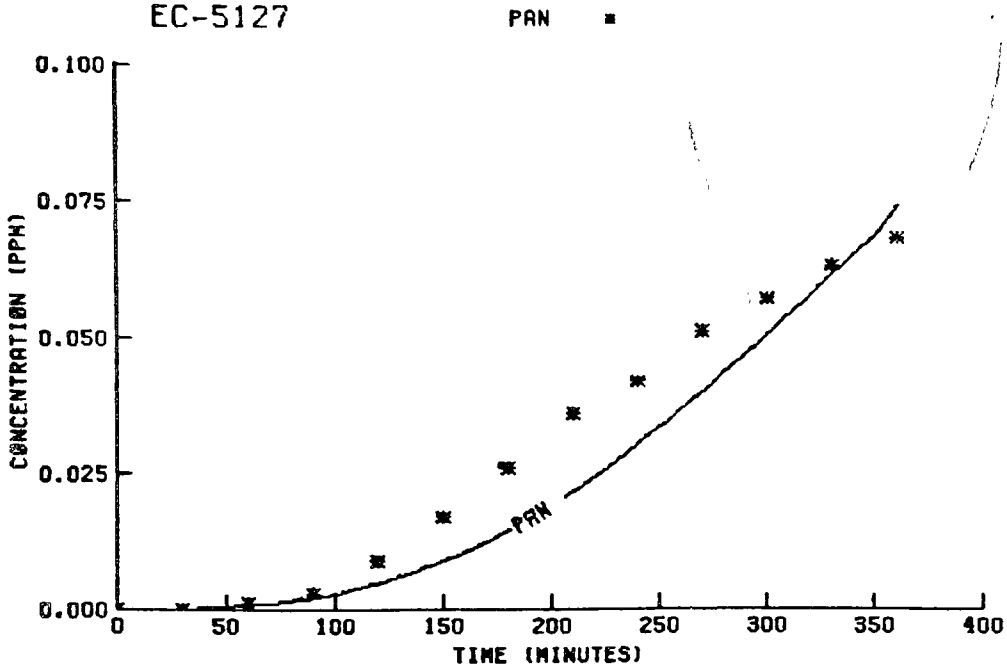

EC-21
PAN
0.004
0.003
0.002
0.001
0.000
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

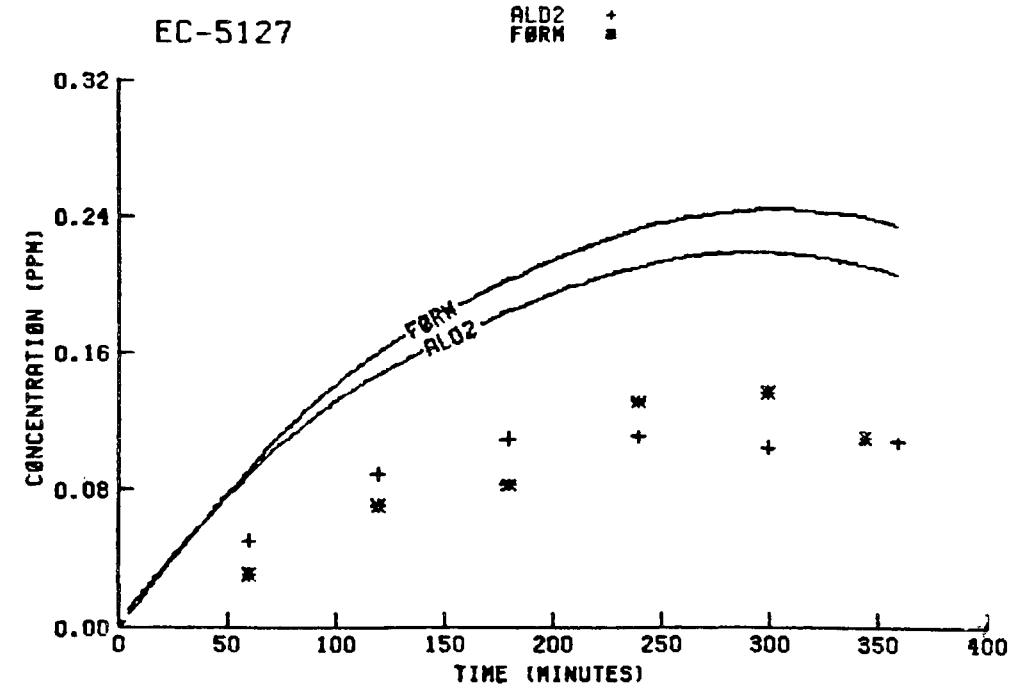

EC-21
FORM
PROP
0.16
0.12
0.08
0.04
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

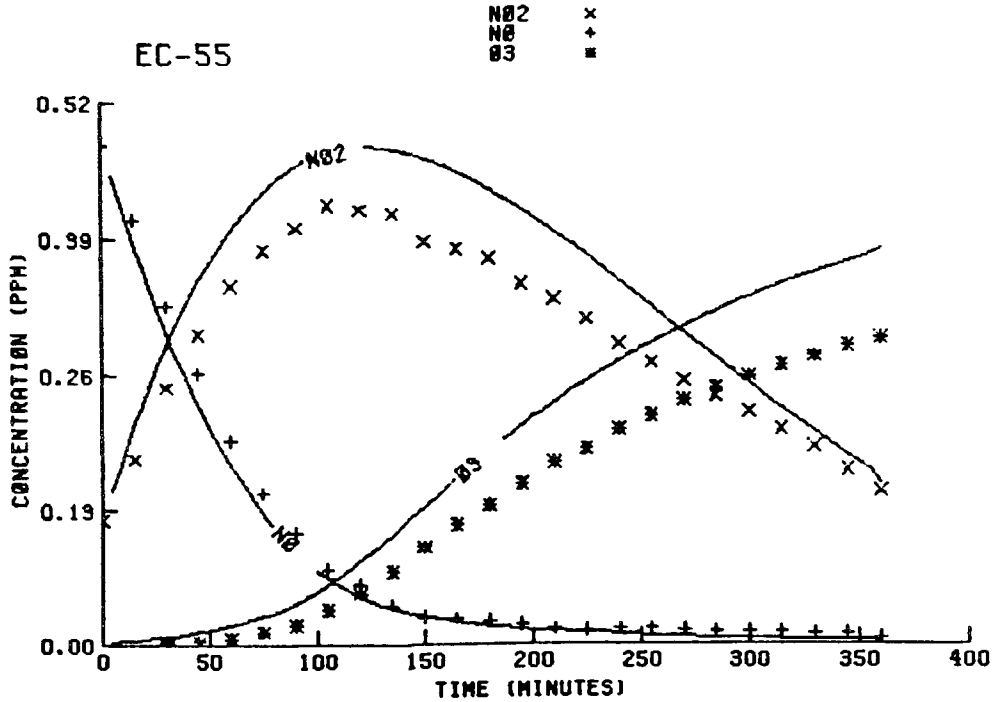

EC-21
ALD2
0.08
0.06
0.04
0.02
0.00
CONCENTRATION (PPM)
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

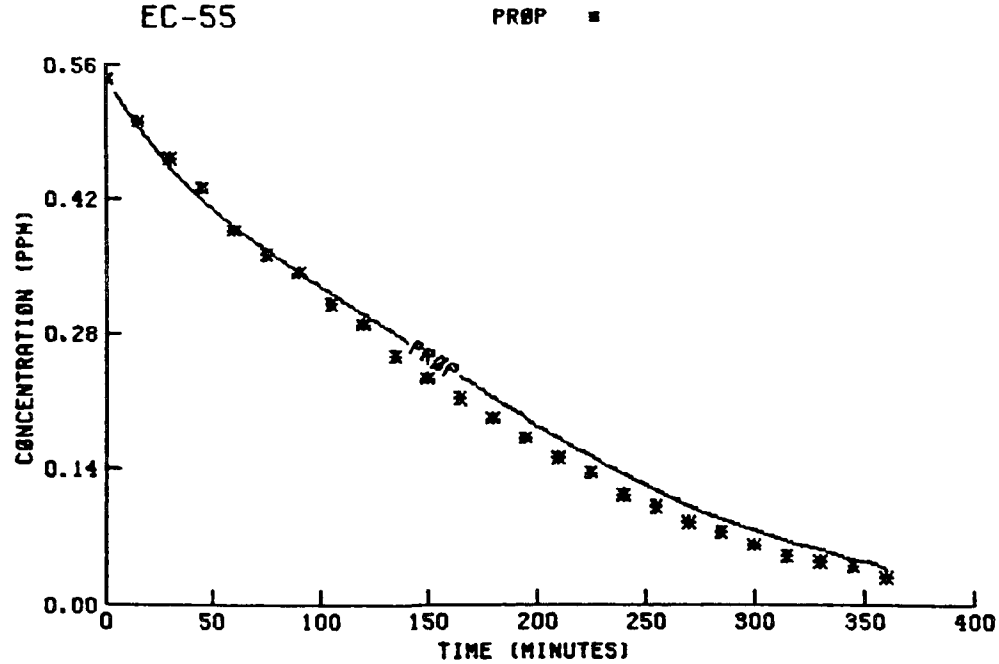

EC-5127
NØ2 ×
NØ +
Ø3 ■
0.56
0.42
0.28
0.14
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

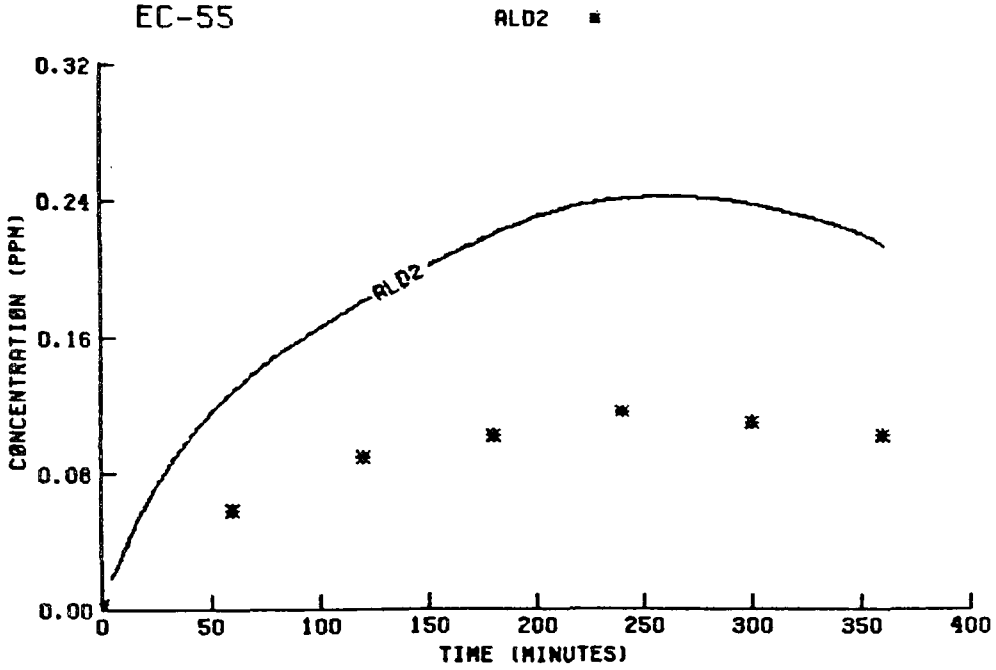

EC-5127
PRØP ■
0.56
0.42
0.28
0.14
0.00
CØNCENTRATIØN (PPM)
PRØP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

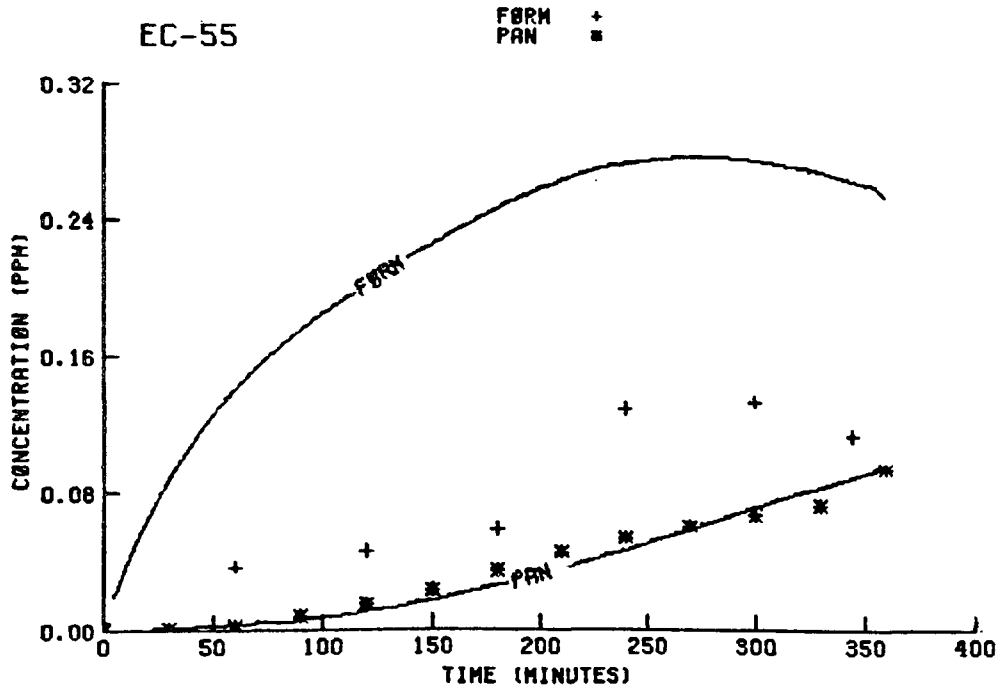

EC-5127
PAN
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

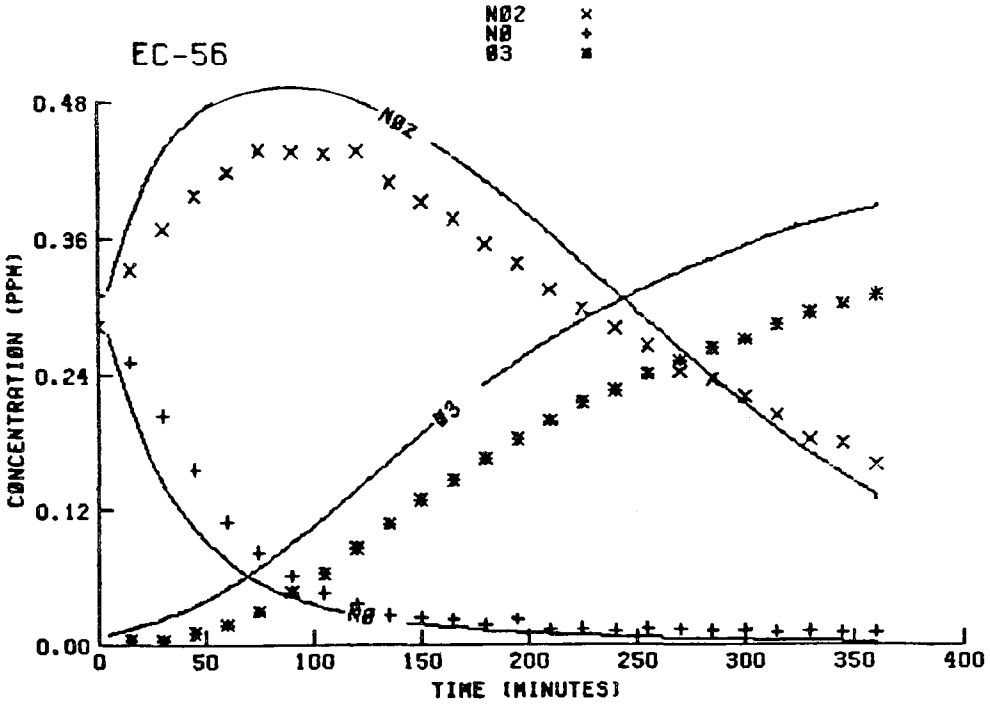

EC-5127
ALD2
FORM
0.32
0.24
0.16
0.08
0.00
CONCENTRATION (PPM)
FORM
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

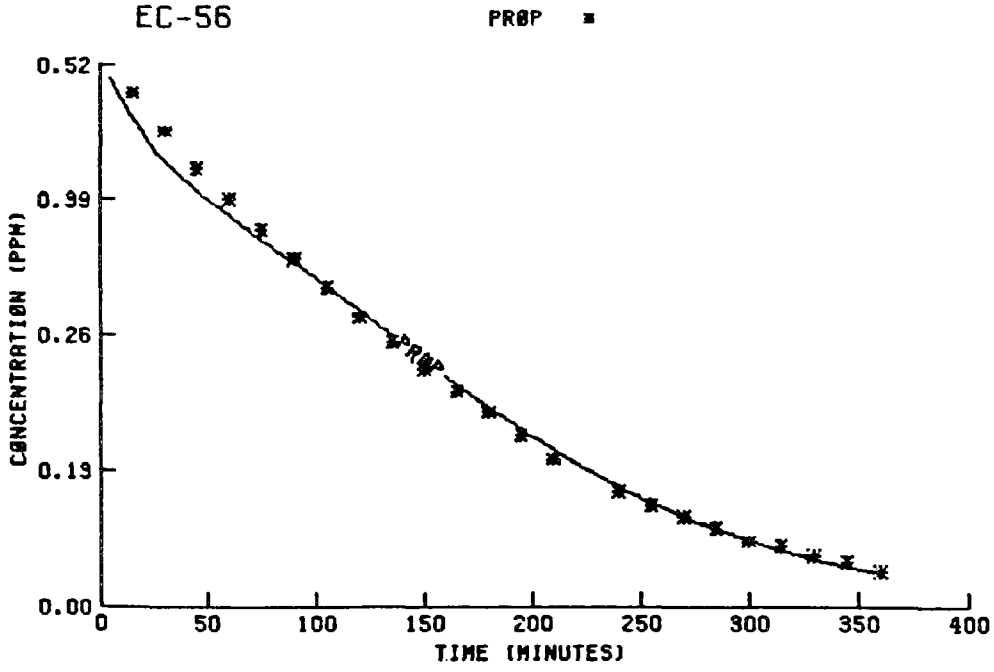

EC-55
NØ2
NØ
Ø3
0.52
0.39
0.26
0.13
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

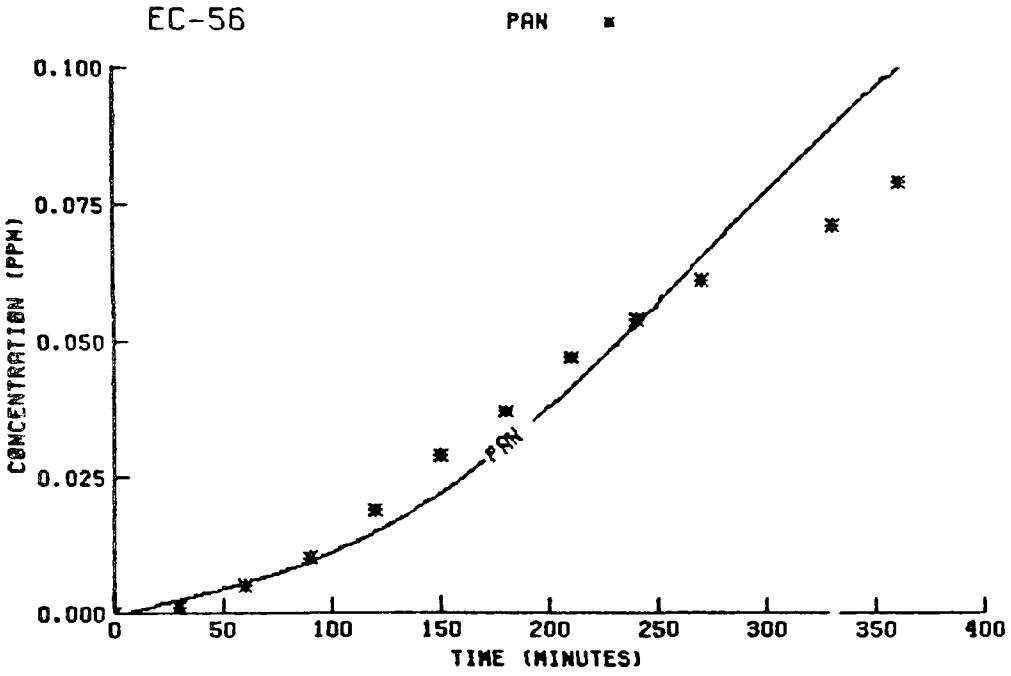

EC-55
PRØP
0.56
0.42
0.28
0.14
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

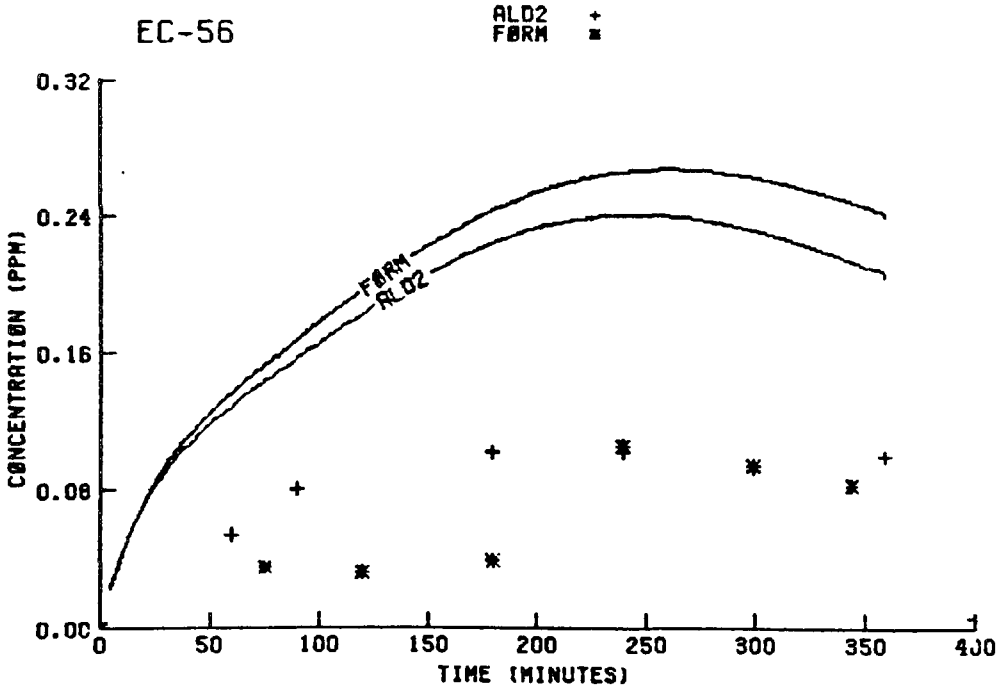

EC-55
ALD2
0.32
0.24
0.16
0.08
0.00
CONCENTRATION (PPM)
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

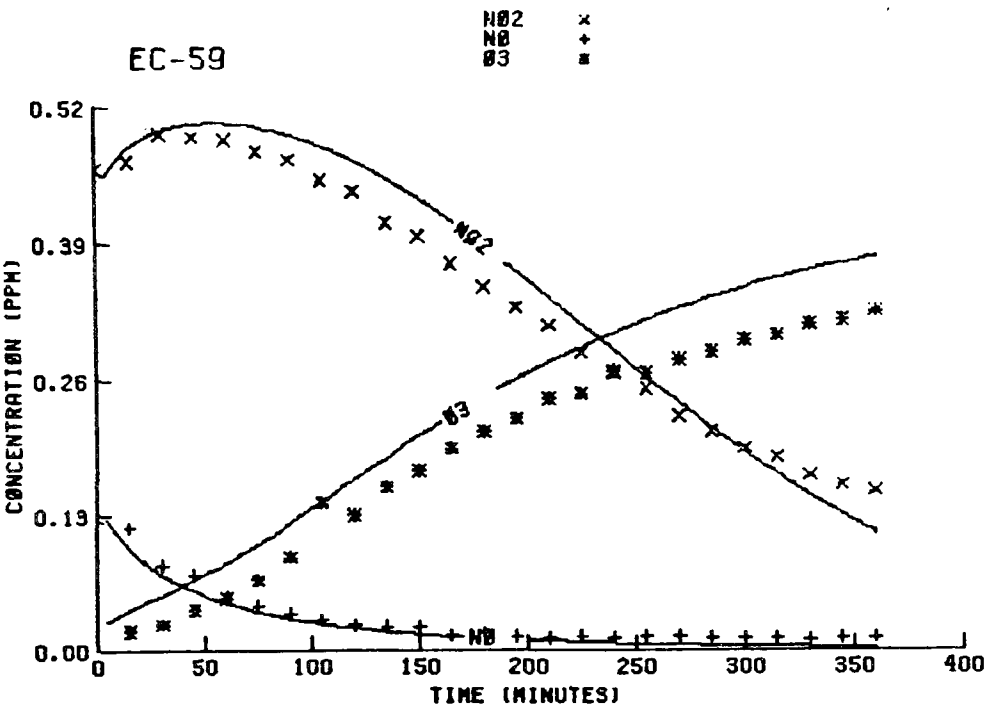

EC-55
FORM
PAN
0.32
0.24
0.16
0.08
0.00
CONCENTRATION (PPM)
FORM
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

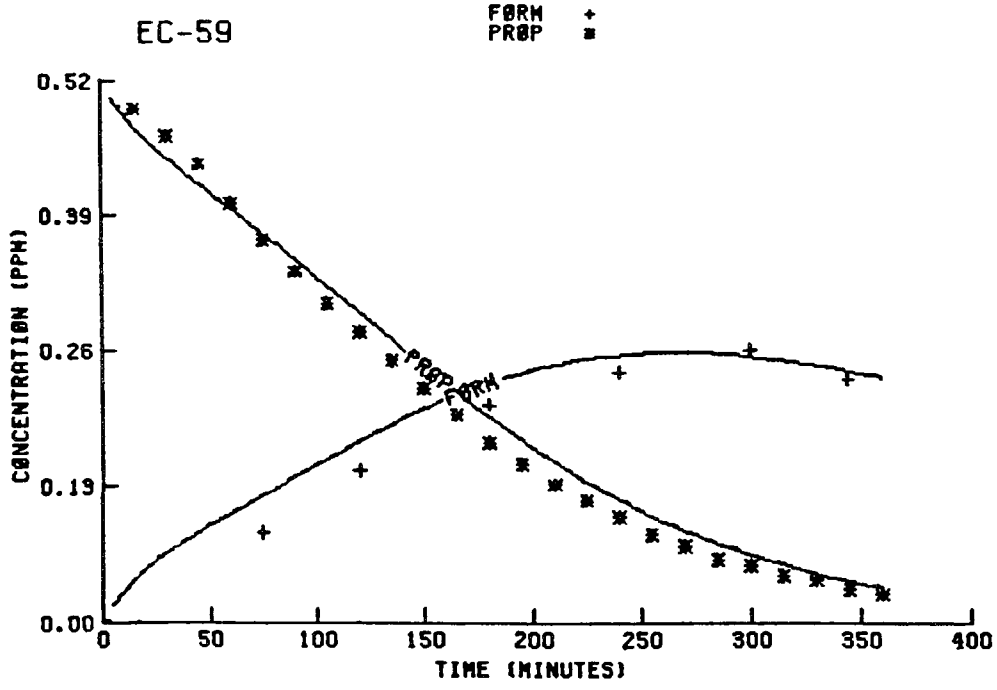

EC-56
NØ2 ×
NØ +
Ø3 ∗
0.48
0.36
0.24
0.12
0.00
CØNCENTRATIØN (PPM)
NØ2
Ø3
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

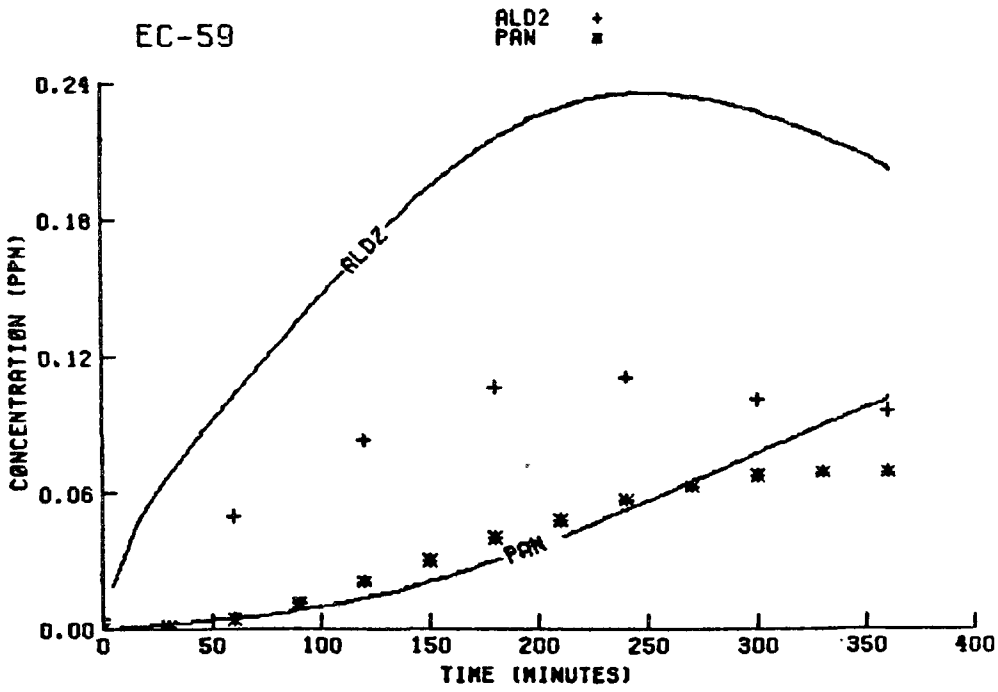

EC-56
PRØP ∗
0.52
0.39
0.26
0.13
0.00
CØNCENTRATIØN (PPM)
PRØP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

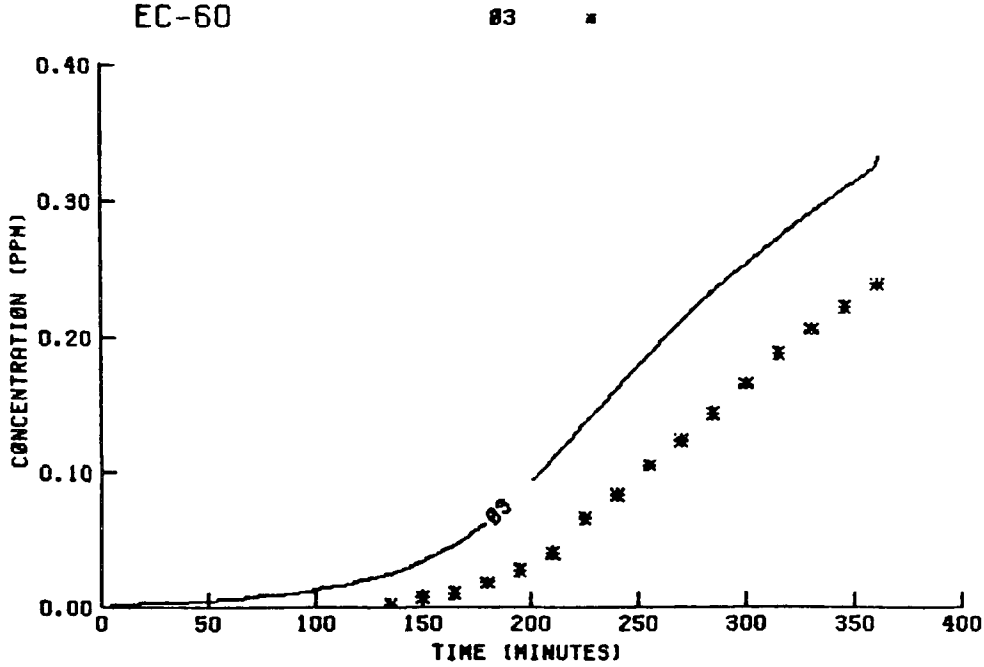

EC-56
PAN
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

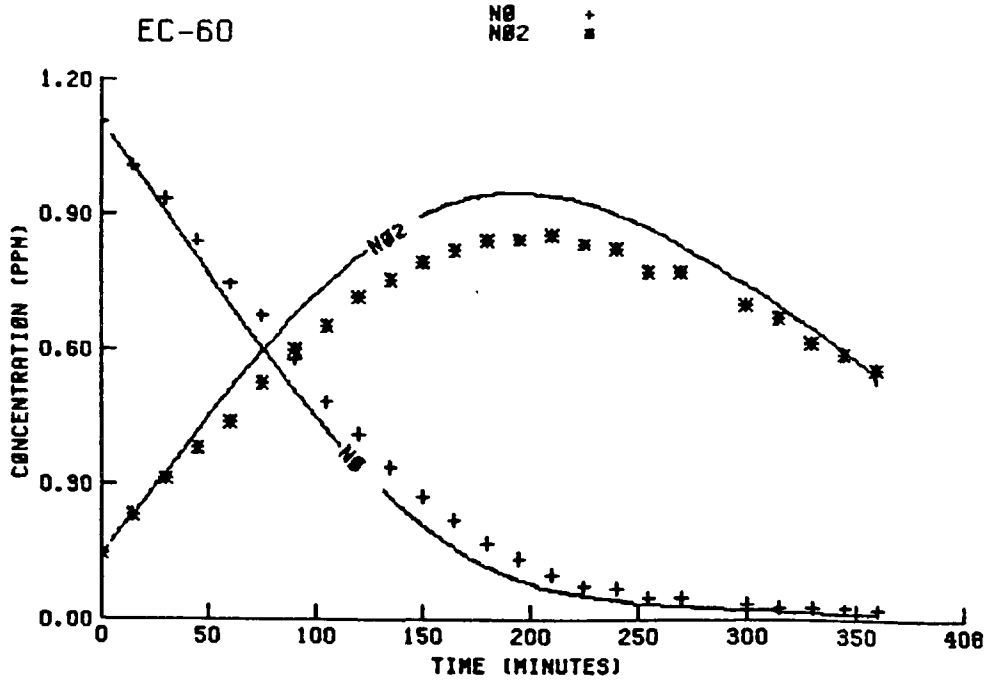

EC-56
ALD2
FORM
0.32
0.24
0.16
0.08
0.00
CONCENTRATION (PPM)
FORM
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

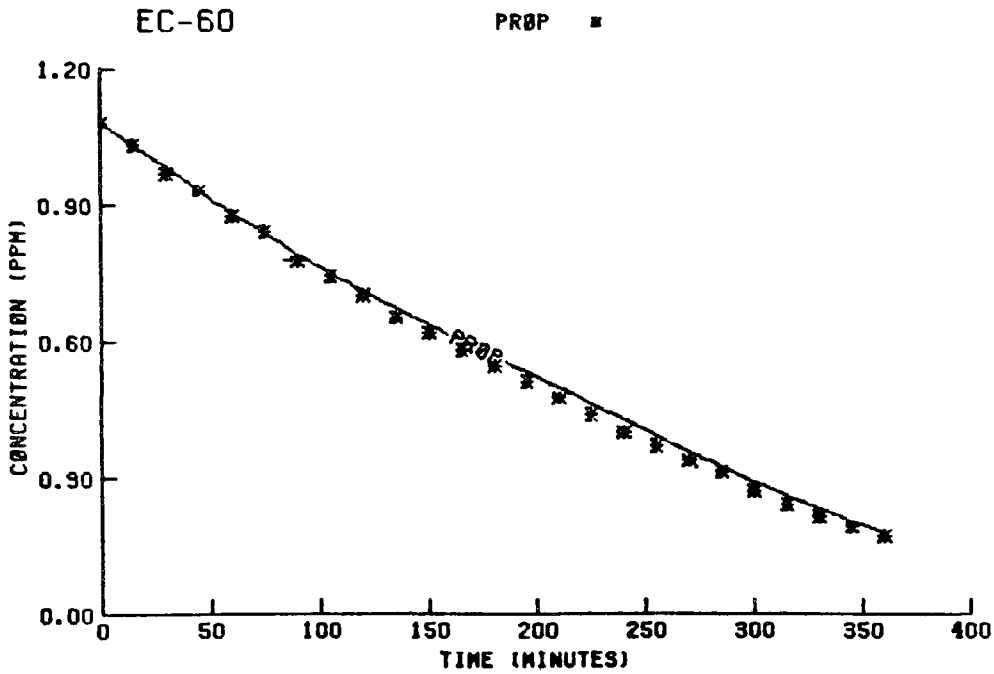

EC-59
NØ2
NØ
Ø3
0.52
0.39
0.26
0.19
0.00
CØNCENTRATIØN (PPH)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

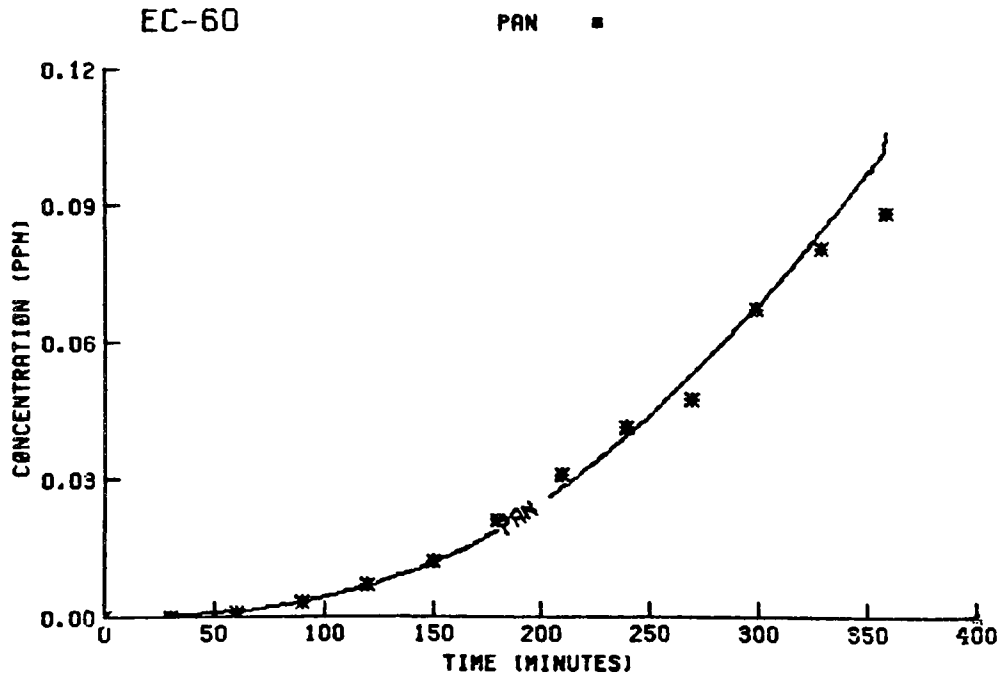

EC-59
FØRM
PRØP
0.52
0.39
0.26
0.19
0.00
CØNCENTRATIØN (PPH)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

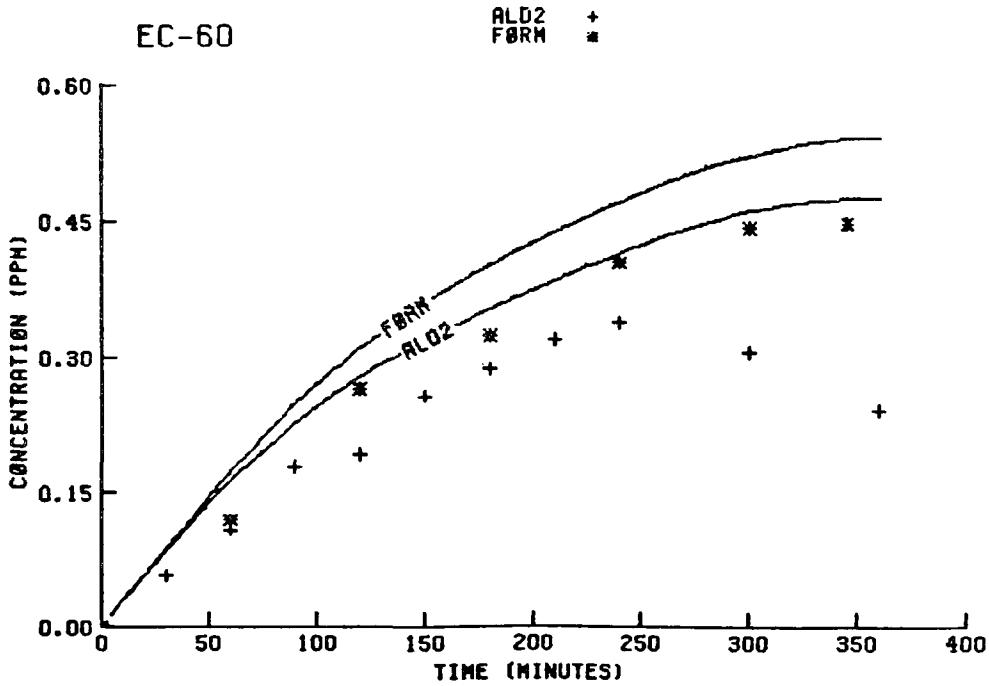

EC-59
ALD2 +
PAN *
0.24
0.18
0.12
0.06
0.00
CONCENTRATION (PPM)
ALD2
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

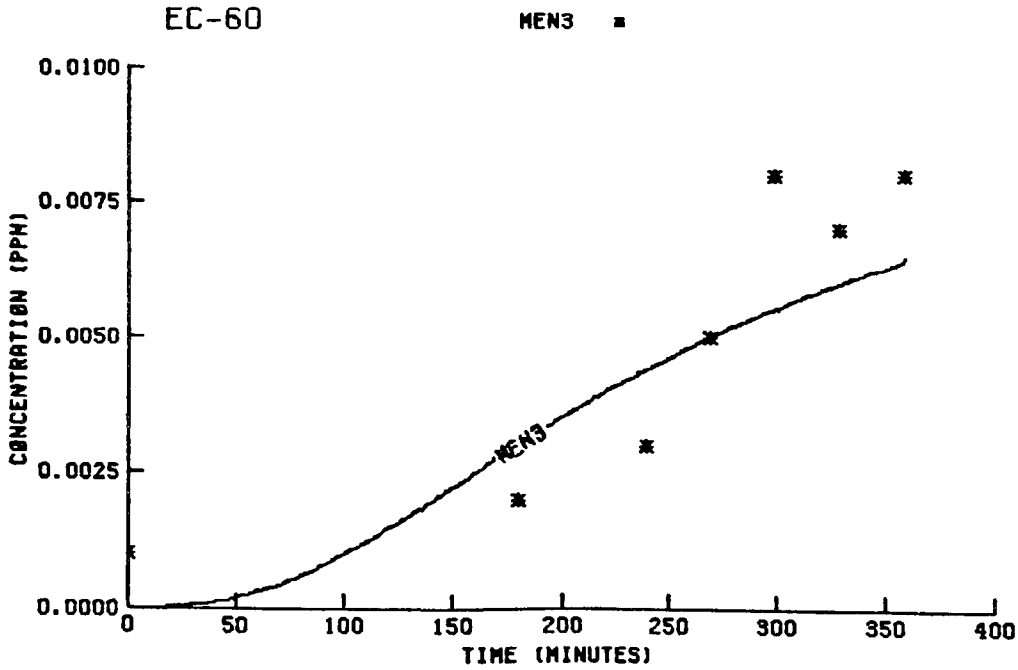

EC-60
Ø3
0.40
0.30
0.20
0.10
0.00
CØNCENTRATIØN (PPM)
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

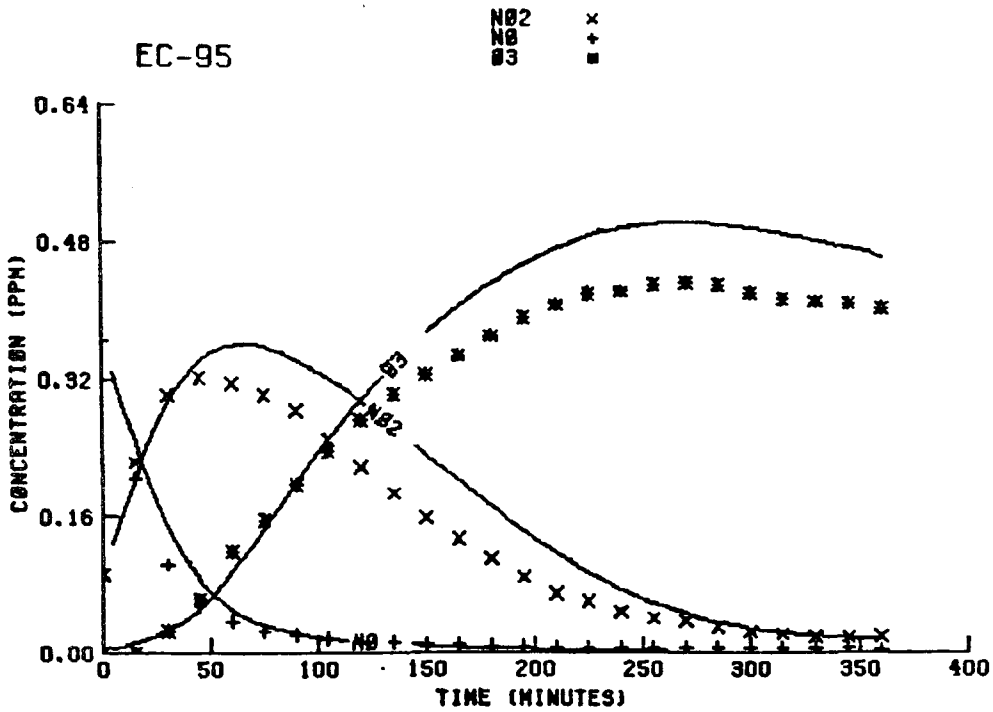

EC-60
NØ
NØ2
1.20
0.90
0.60
0.90
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

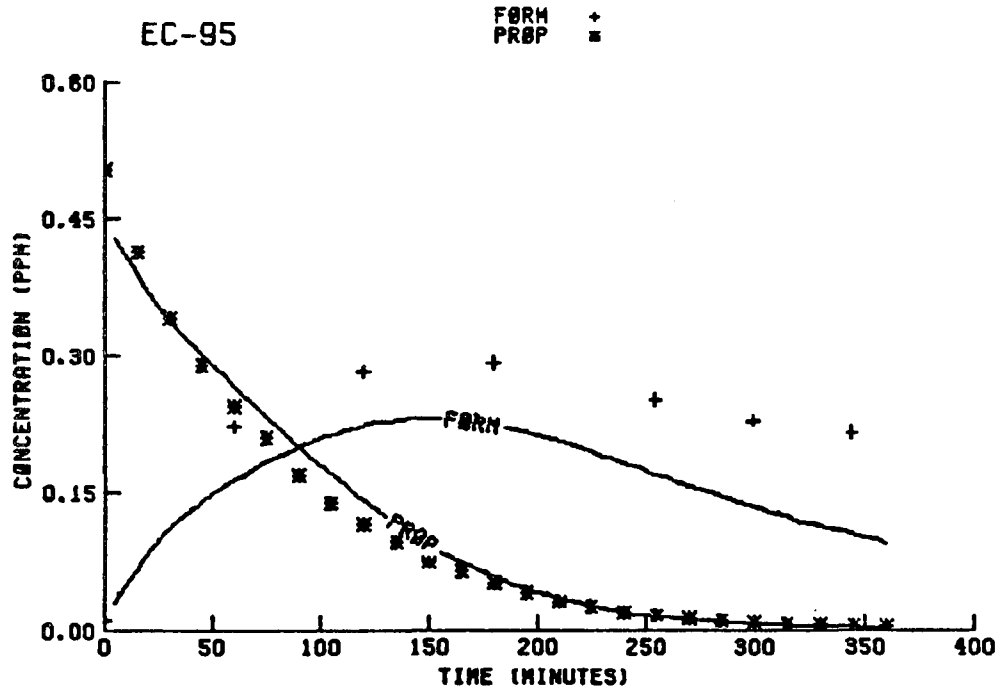

EC-60
PROP
1.20
0.90
0.60
0.30
0.00
CONCENTRATION (PPM)
PROP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

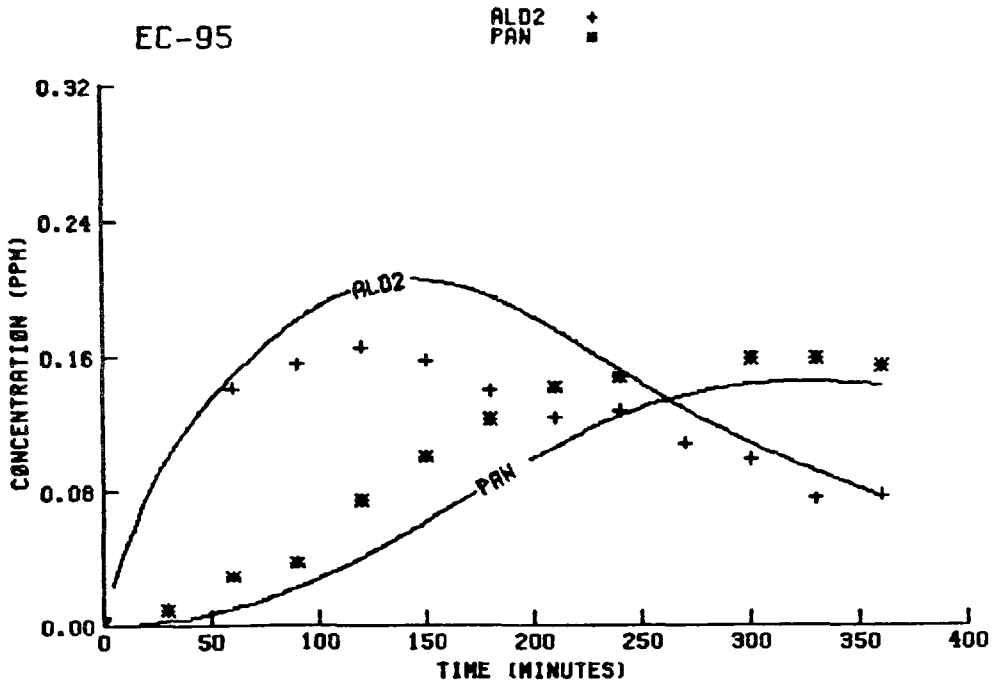

EC-60
PAN
0.12
0.09
0.06
0.03
0.00
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

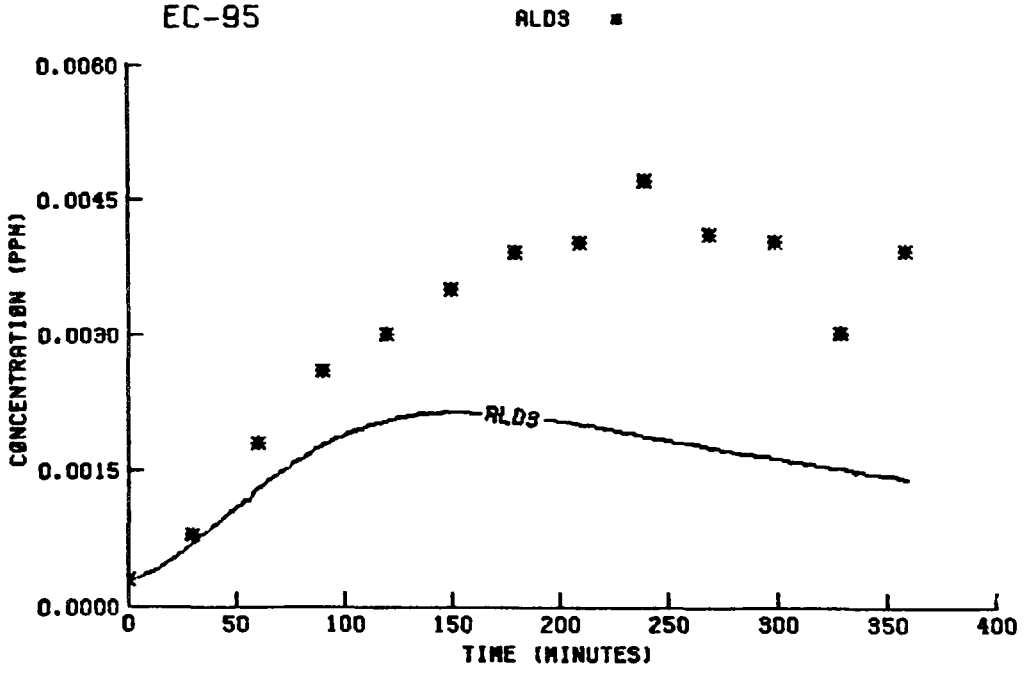

EC-60
ALD2 +
FØRM *
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
FØRM
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

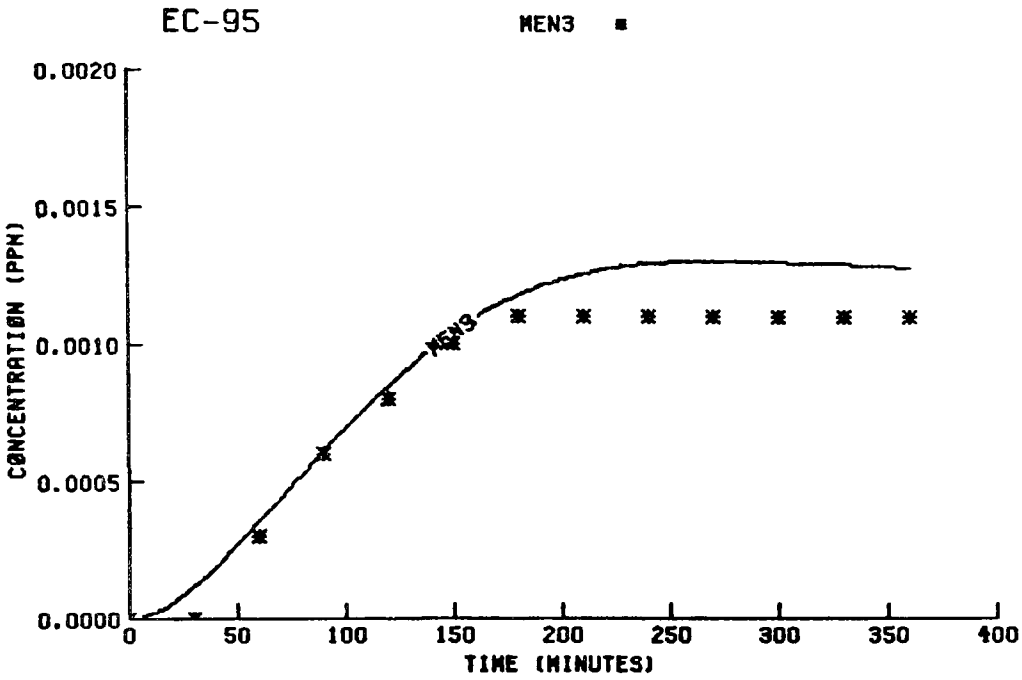

EC-60
MEN3 *
0.0100
0.0075
0.0050
0.0025
0.0000
CØNCENTRATIØN (PPM)
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

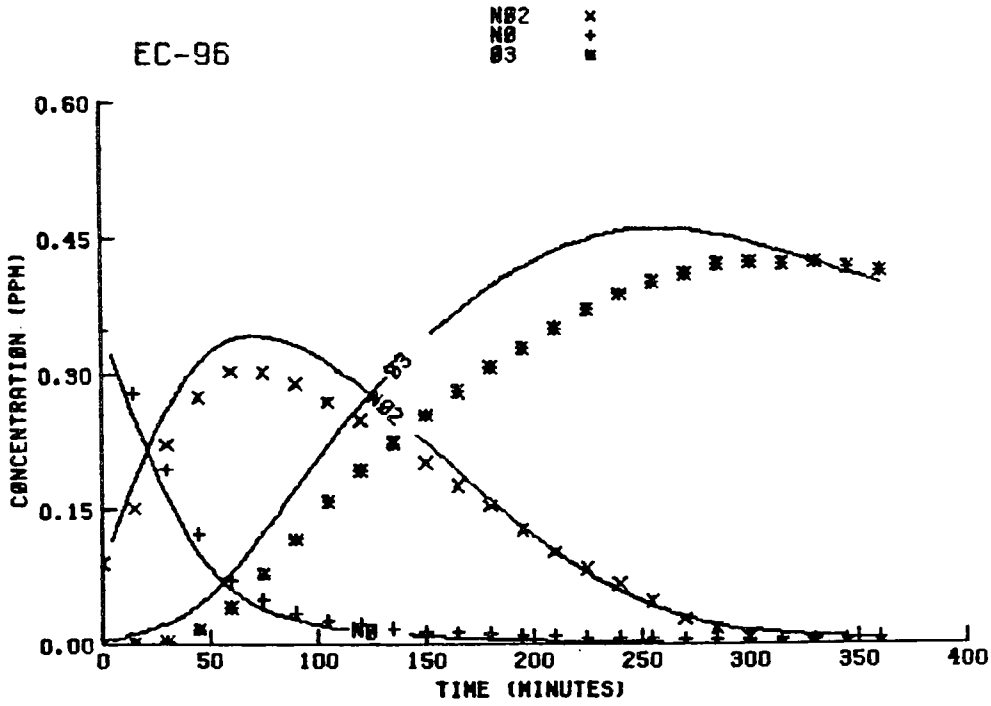

EC-95
NØ2
NØ
Ø3
0.64
0.48
0.32
0.16
0.00
CØNCENTRATIØN (PPM)
Ø3
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

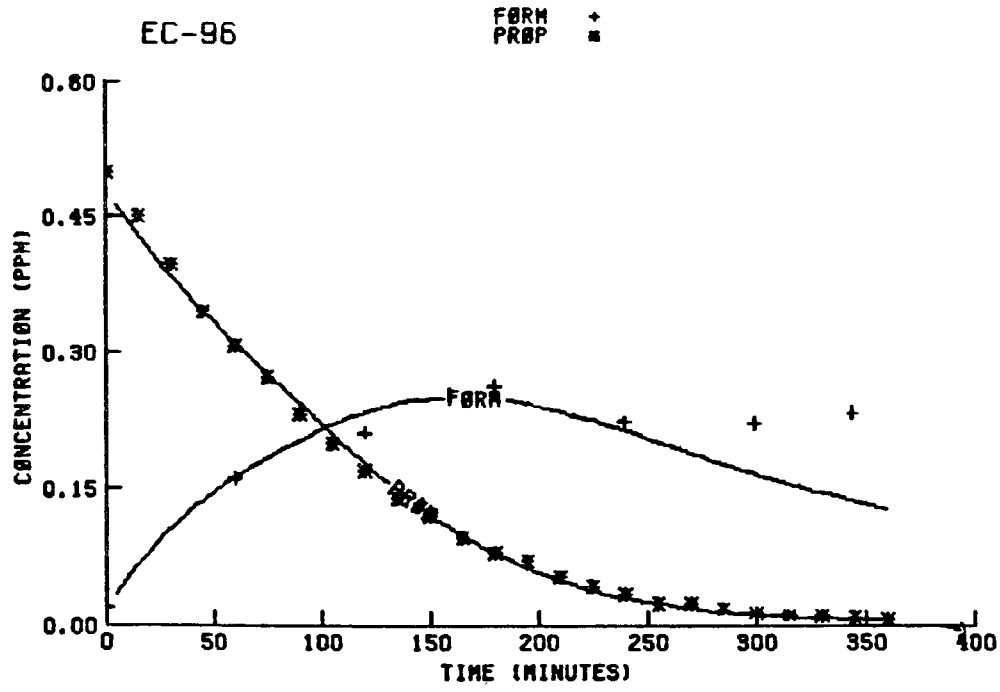

EC-95
FØRM
PRØP
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
FØRM
PRØP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

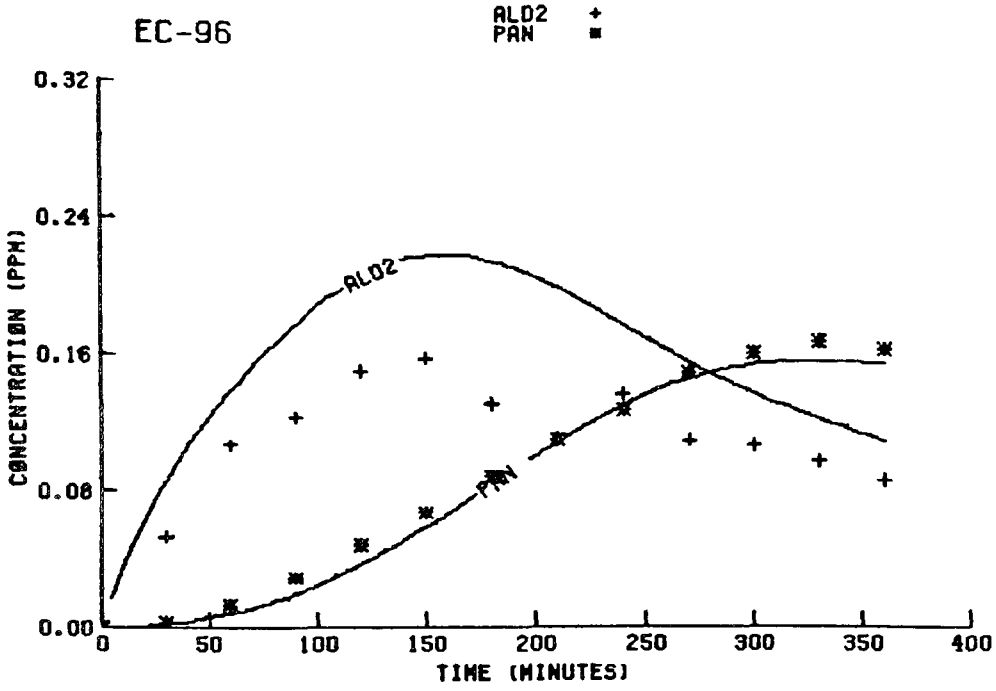

EC-95
ALD2 +
PAN ■
0.32
0.24
0.16
0.08
0.00
CONCENTRATION (PPM)
ALD2
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

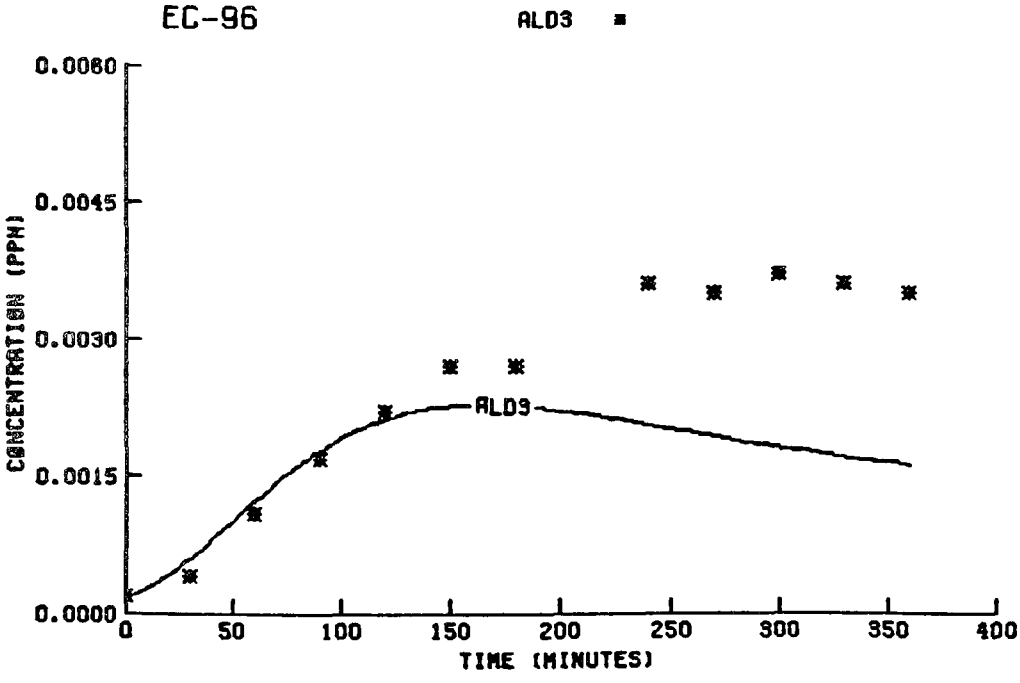

EC-95
ALD3 ■
0.0060
0.0045
0.0030
0.0015
0.0000
CONCENTRATION (PPM)
ALD3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

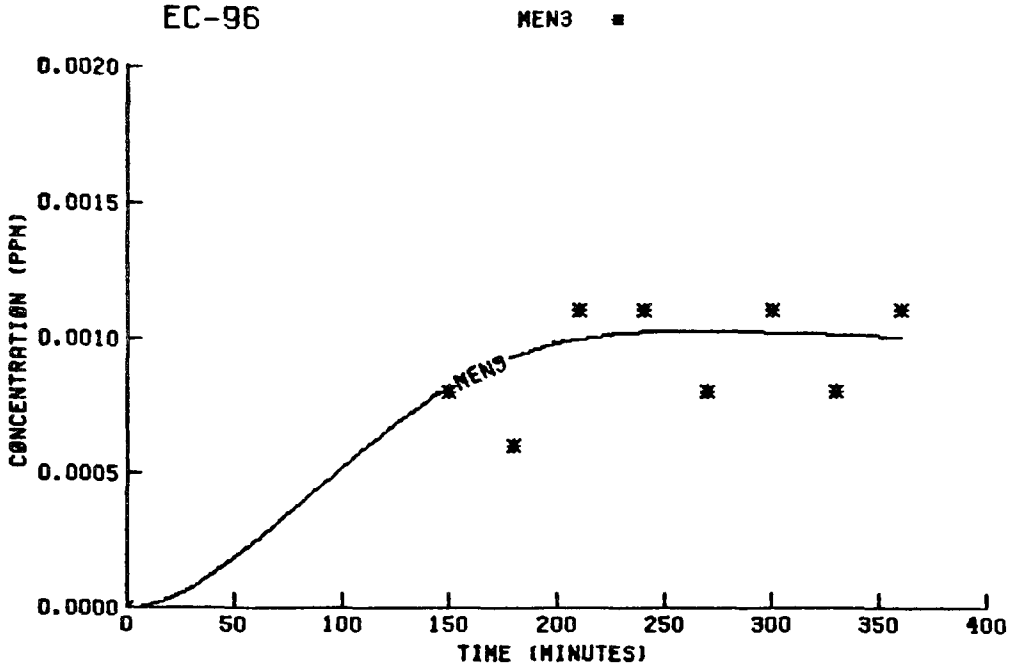

EC-95
MEN3
0.0020
0.0015
0.0010
0.0005
0.0000
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

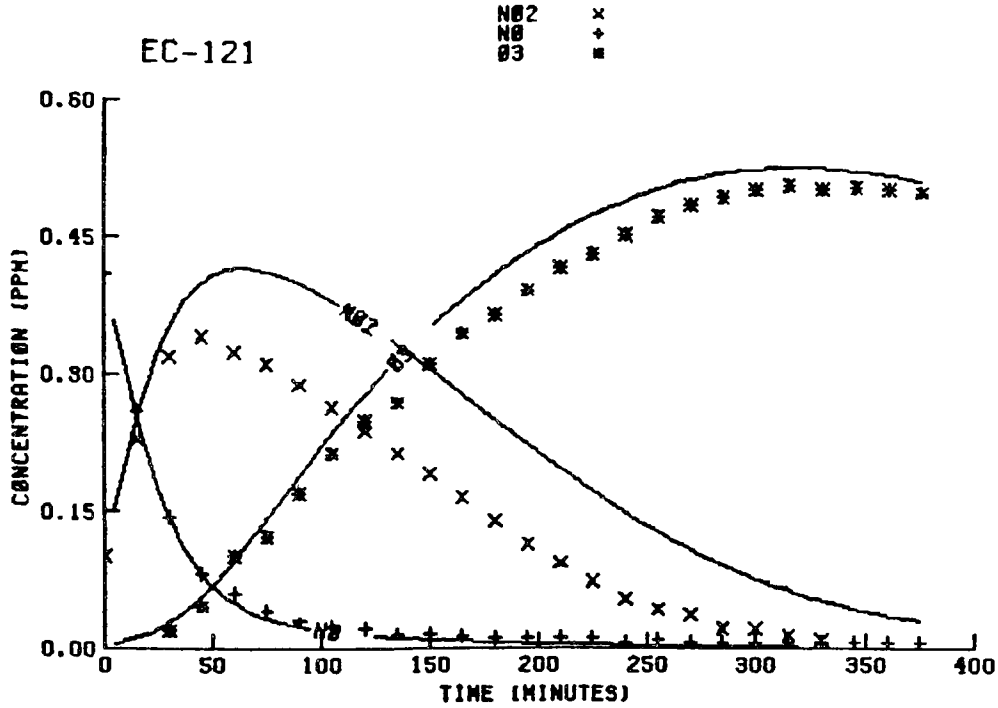

EC-96
NØ2
NØ
Ø3
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

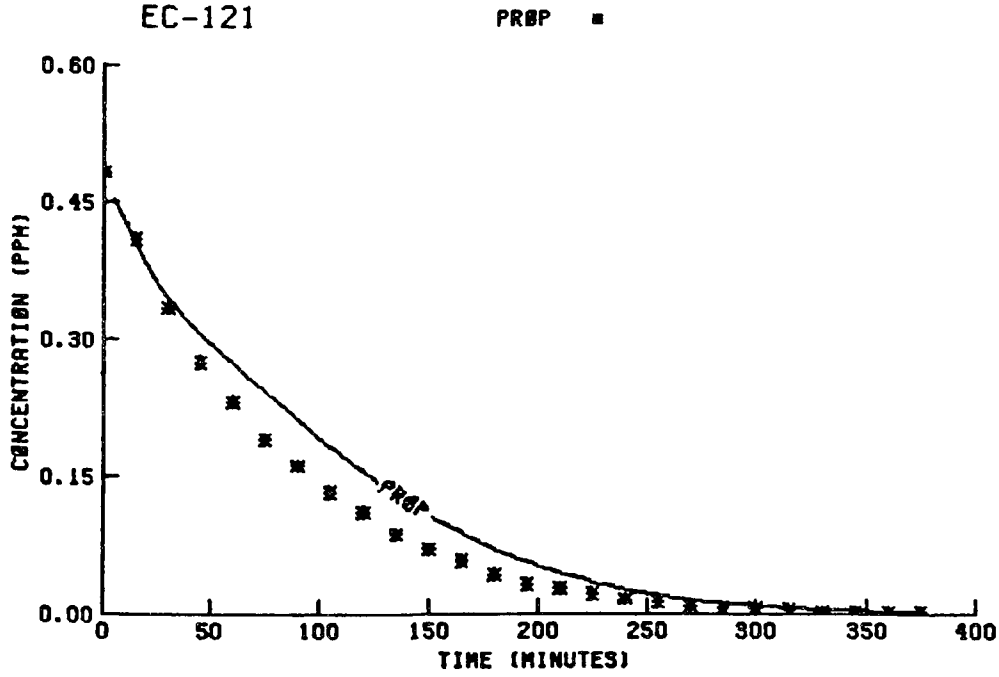

EC-96
FØRM
PRØP
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

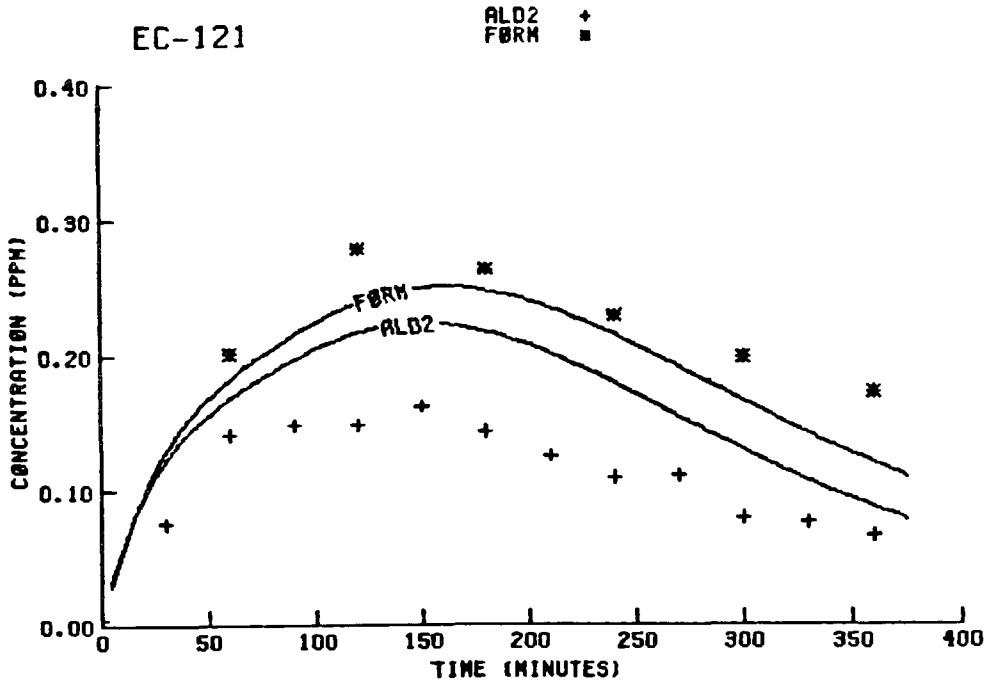

EC-96
ALD2 +
PAN ■
0.32
0.24
0.16
0.08
0.00
CONCENTRATION (PPM)
ALD2
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

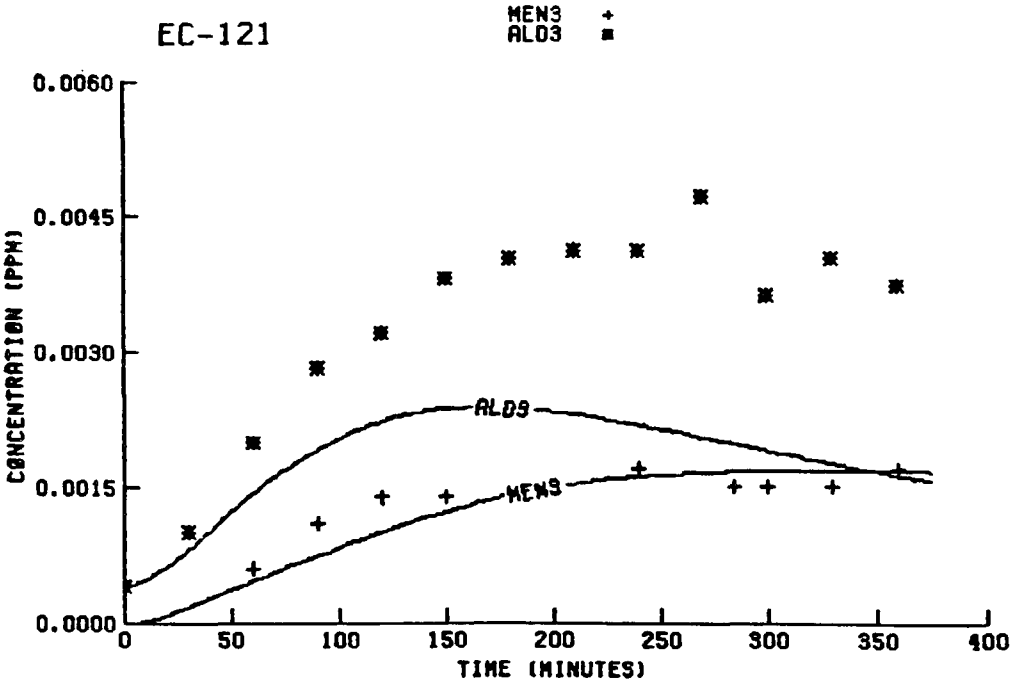

EC-96
ALD3 ■
0.0060
0.0045
0.0030
0.0015
0.0000
CONCENTRATION (PPM)
ALD3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

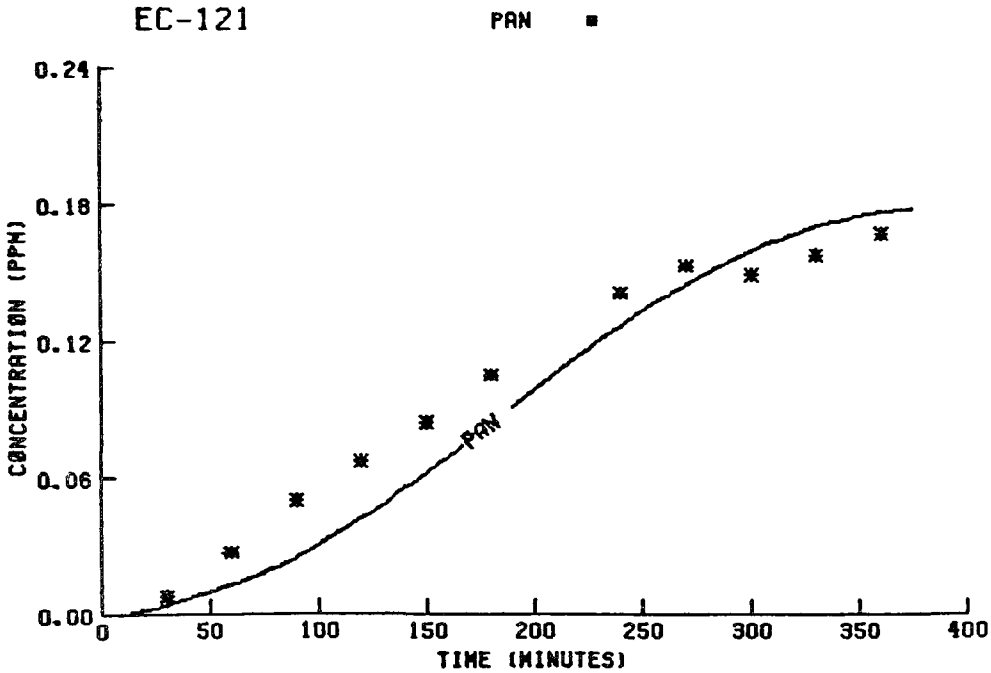

EC-96
MEN3
0.0020
0.0015
0.0010
0.0005
0.0000
CONCENTRATION (PPM)
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

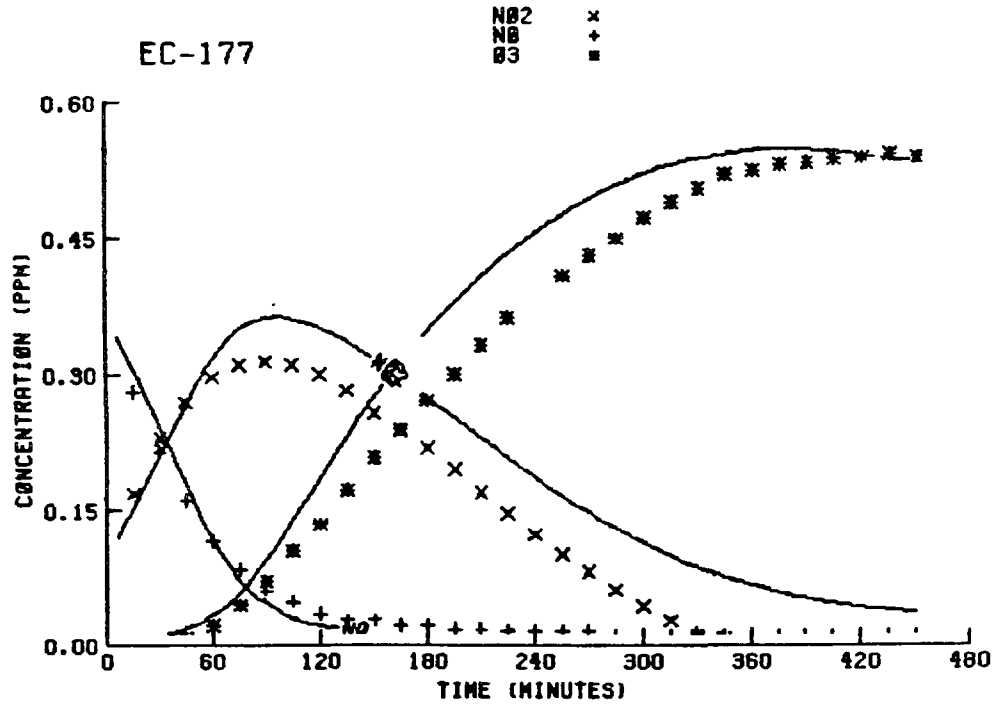

EC-121
NØ2
NØ
Ø3
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

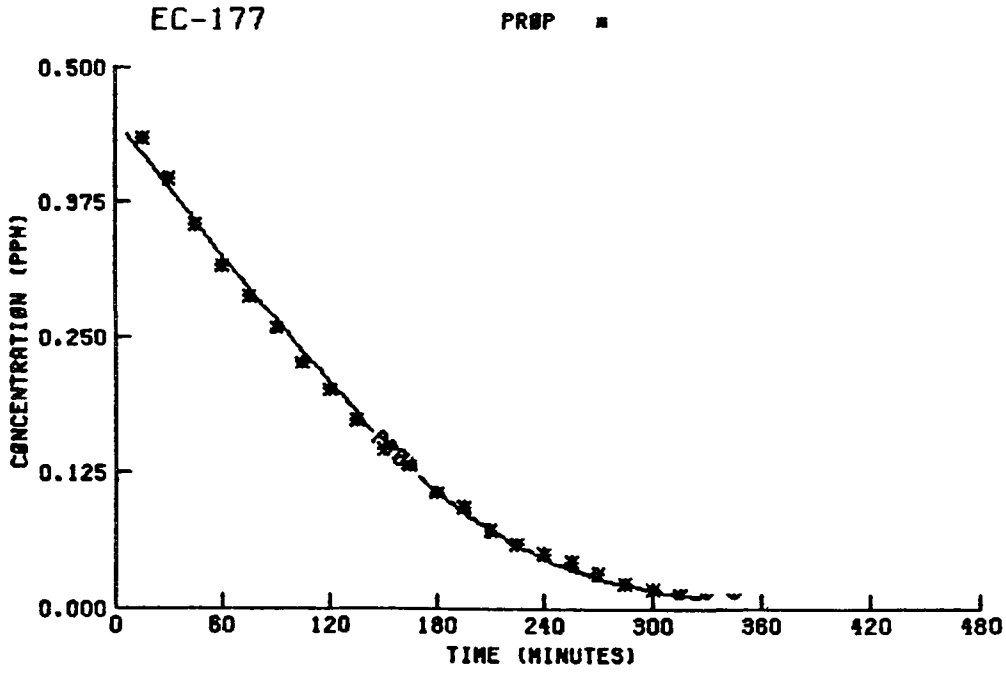

EC-121
PRØP
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

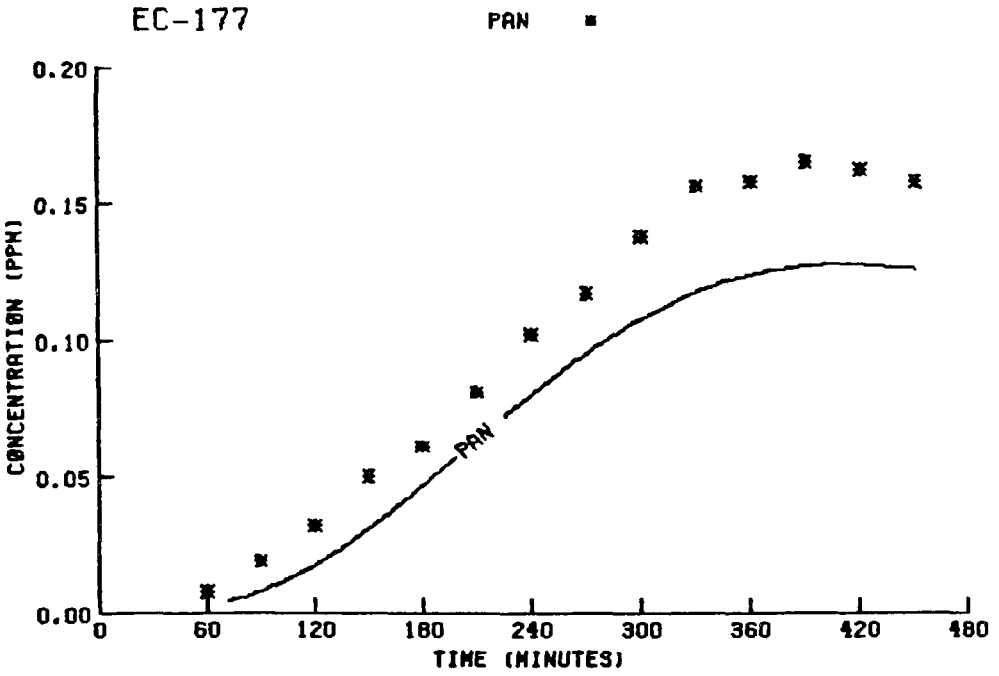

EC-121
ALD2 +
FORM ■
0.40
0.30
0.20
0.10
0.00
CONCENTRATION (PPM)
FORM
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

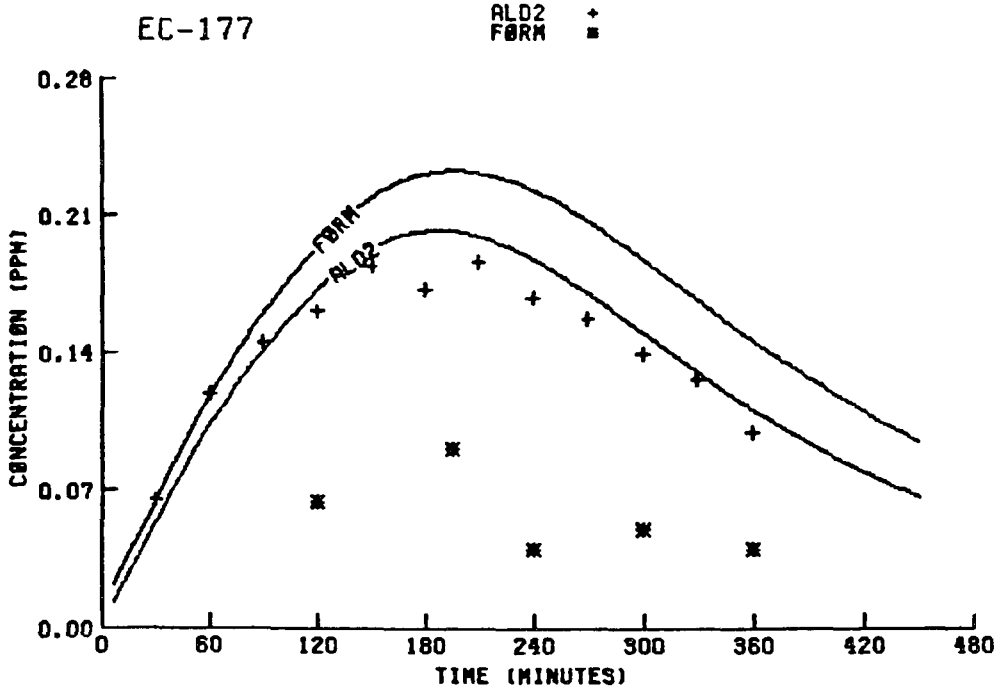

EC-121
MEN3 +
ALD3 ■
0.0060
0.0045
0.0030
0.0015
0.0000
CONCENTRATION (PPM)
ALD3
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

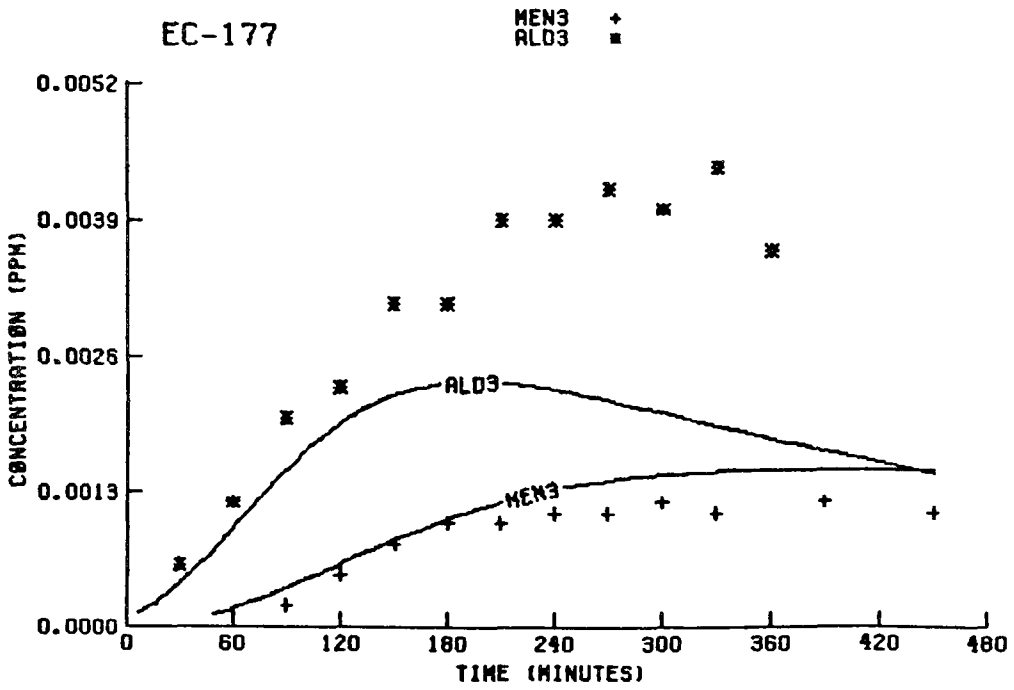

EC-121
PAN
0.24
0.18
0.12
0.06
0.00
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

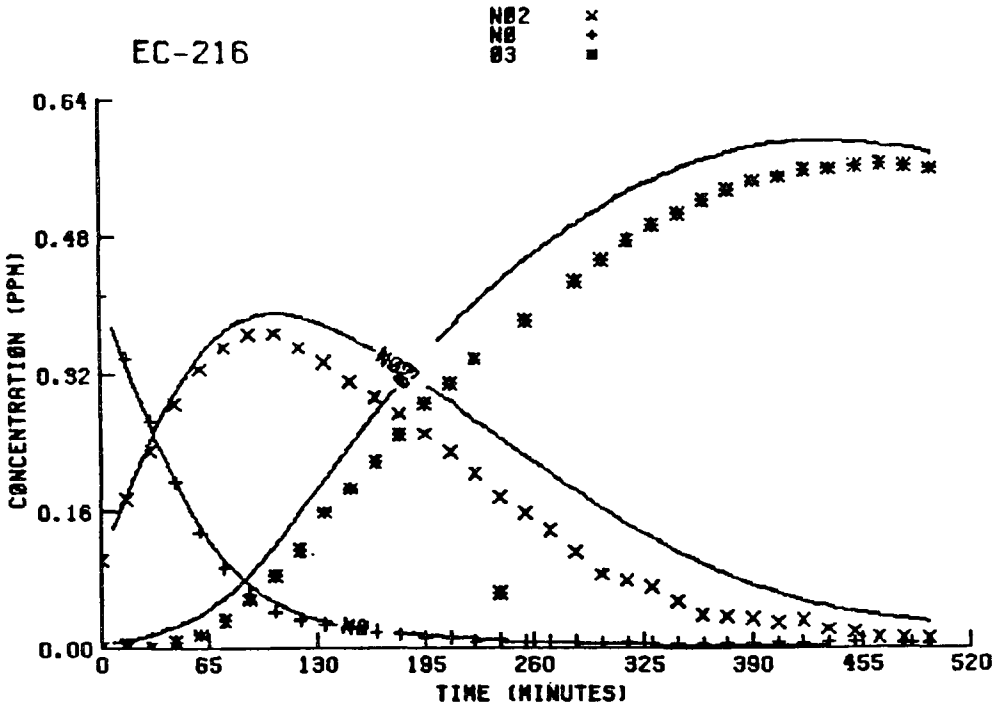

EC-177
NØ2 ×
NØ +
Ø3 ■
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

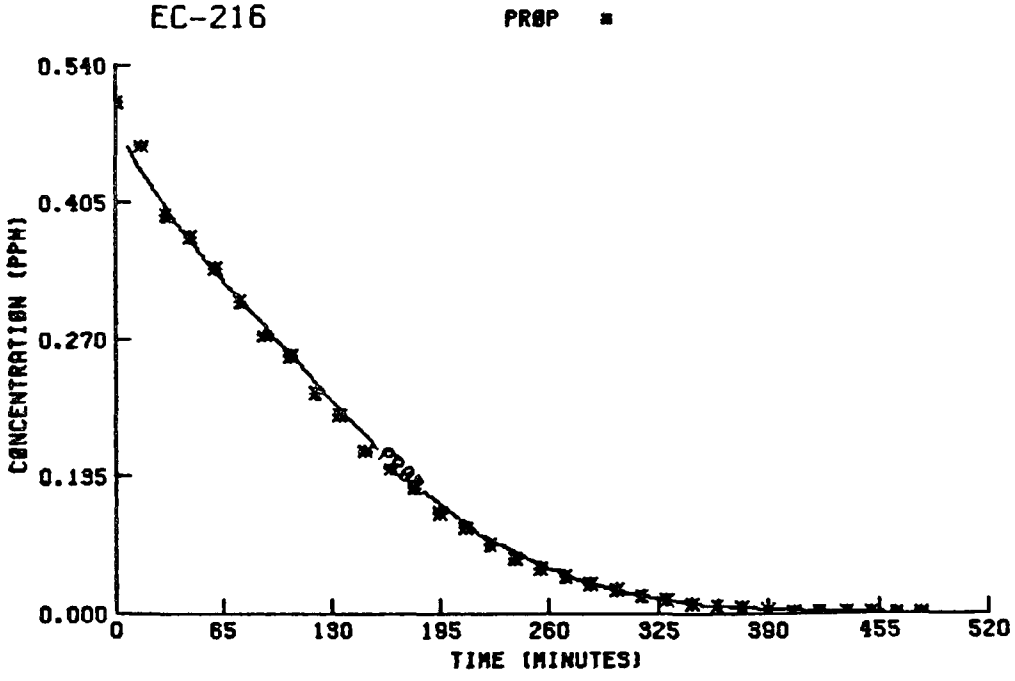

EC-177
PRØP ■
0.500
0.375
0.250
0.125
0.000
CØNCENTRATIØN (PPM)
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

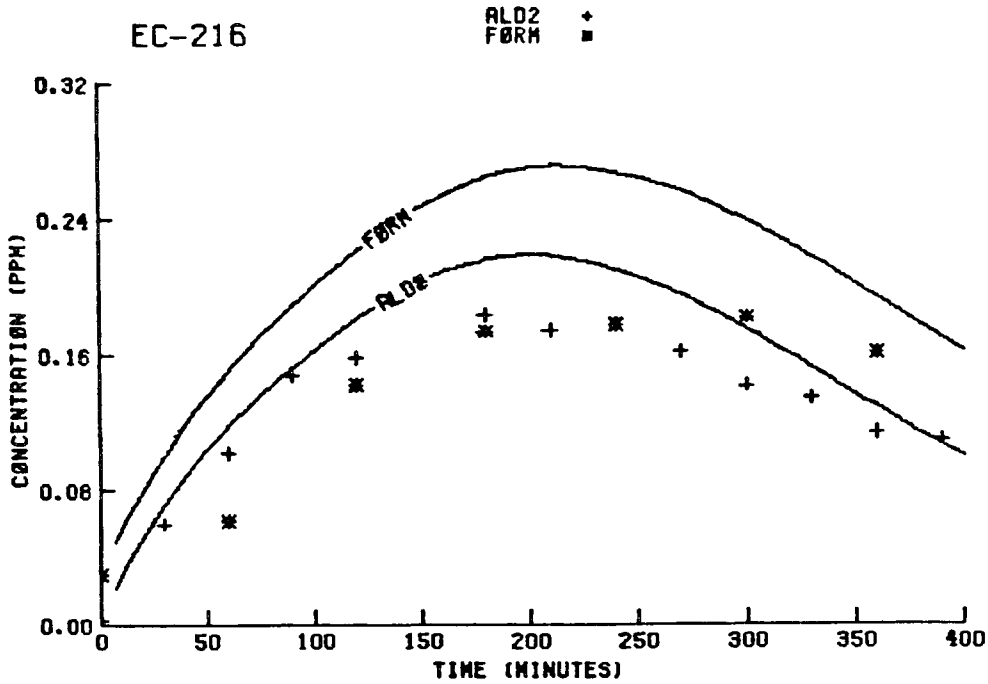

EC-177
PAN
0.20
0.15
0.10
0.05
0.00
CONCENTRATION (PPM)
PAN
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

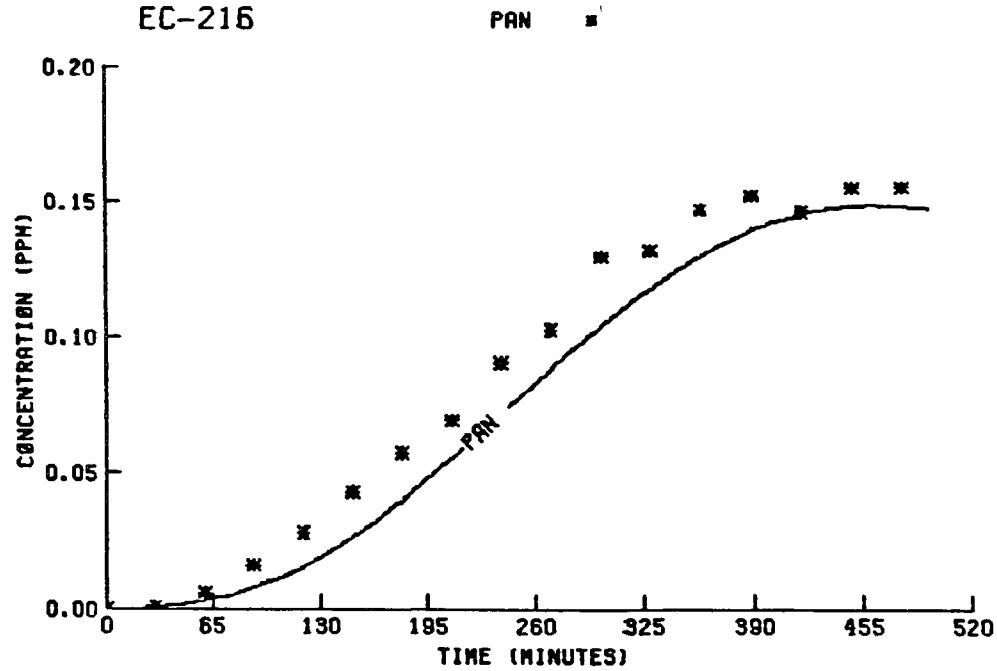

EC-177
ALD2
FORM
0.28
0.21
0.14
0.07
0.00
CONCENTRATION (PPM)
FORM
ALD2
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

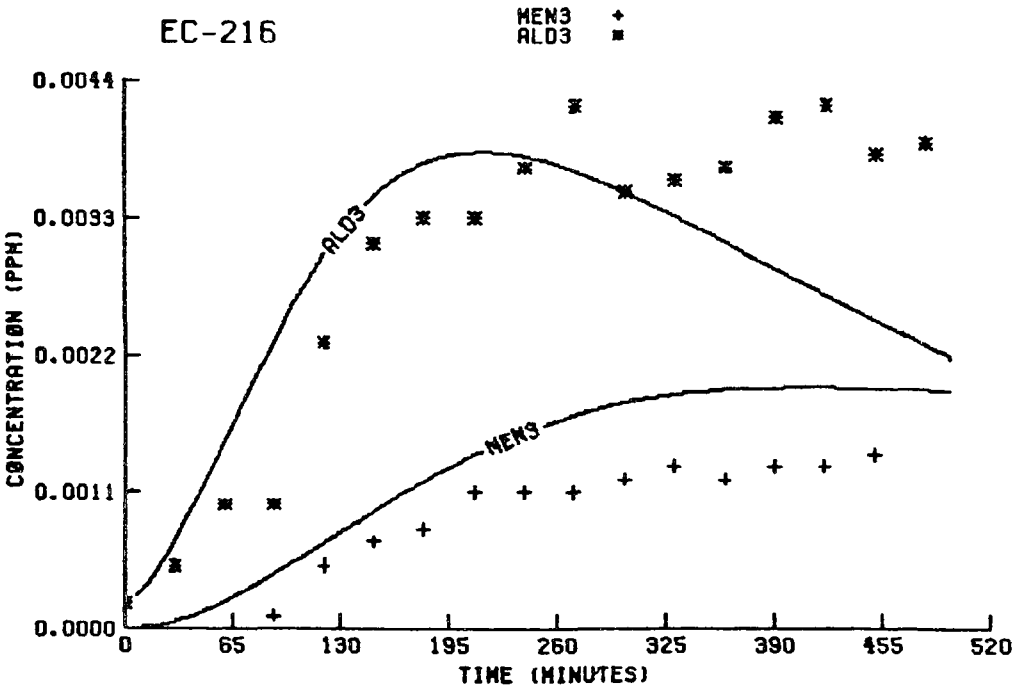

EC-177
MEN3 +
ALD3 ■
0.0052
0.0039
0.0026
0.0013
0.0000
CONCENTRATION (PPM)
ALD3
MEN3
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

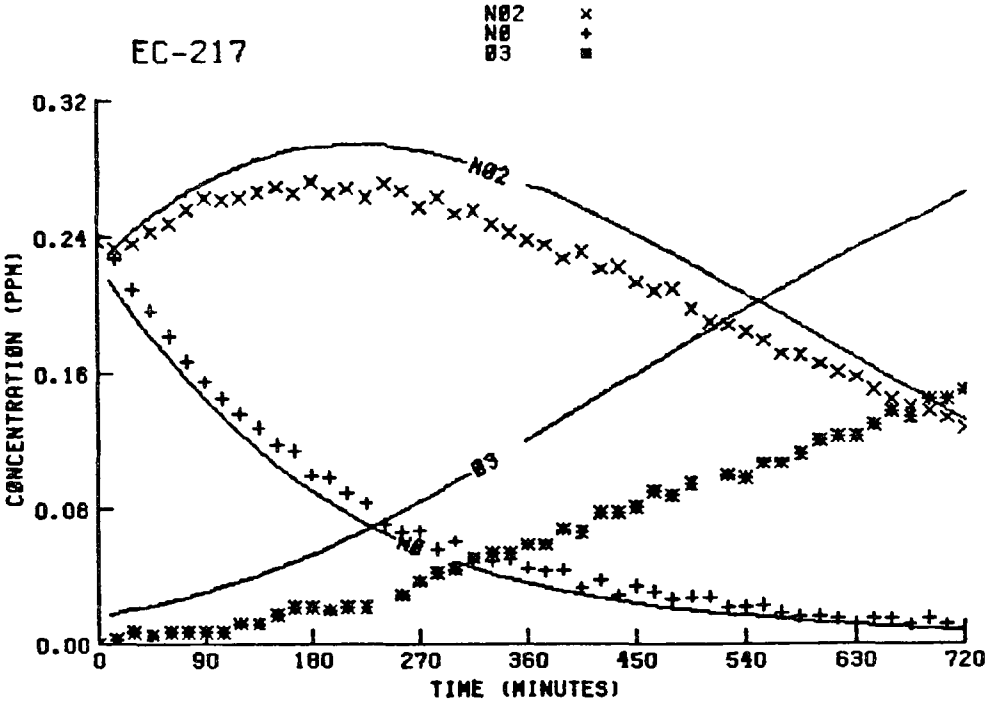

EC-216
NO2
NO
O3
0.64
0.48
0.32
0.16
0.00
CONCENTRATION (PPM)
NO2
NO
O3
0
65
130
195
260
325
390
455
520
TIME (MINUTES)

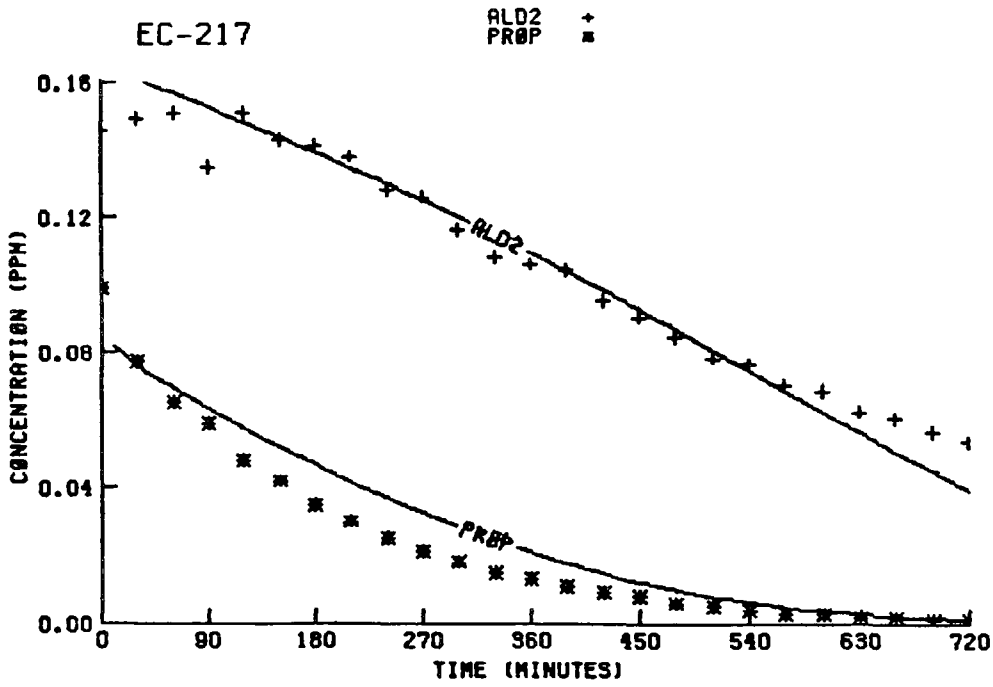

EC-216
PROP
0.540
0.405
0.270
0.135
0.000
CONCENTRATION (PPM)
PROP
0
65
130
195
260
325
390
455
520
TIME (MINUTES)

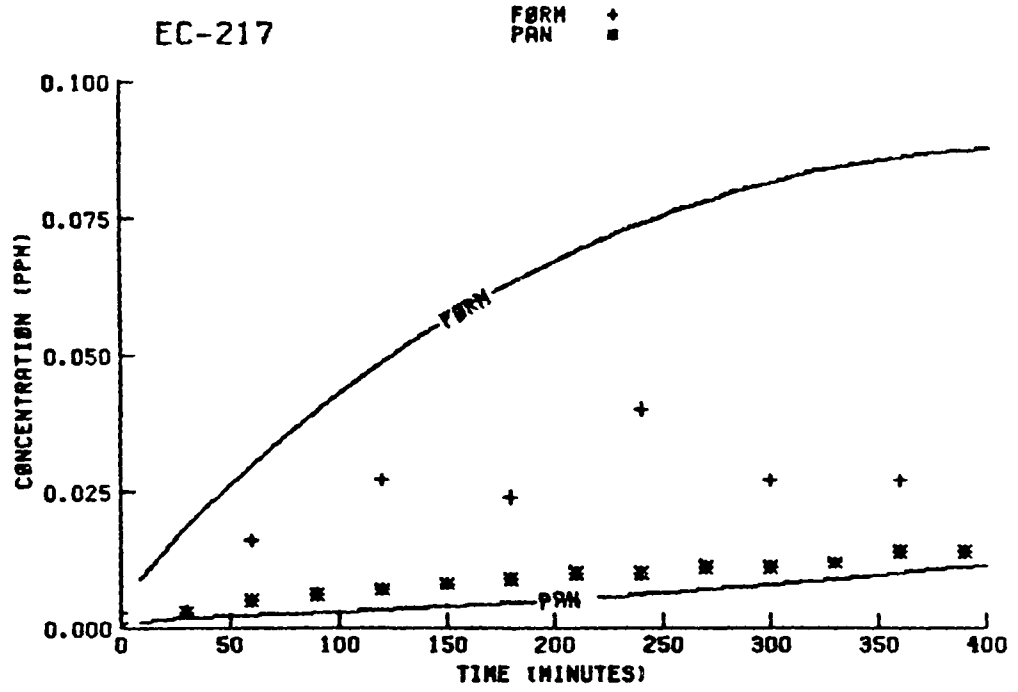

EC-216
ALD2 +
FORM ■
0.32
0.24
0.16
0.08
0.00
CONCENTRATION (PPM)
FORM
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

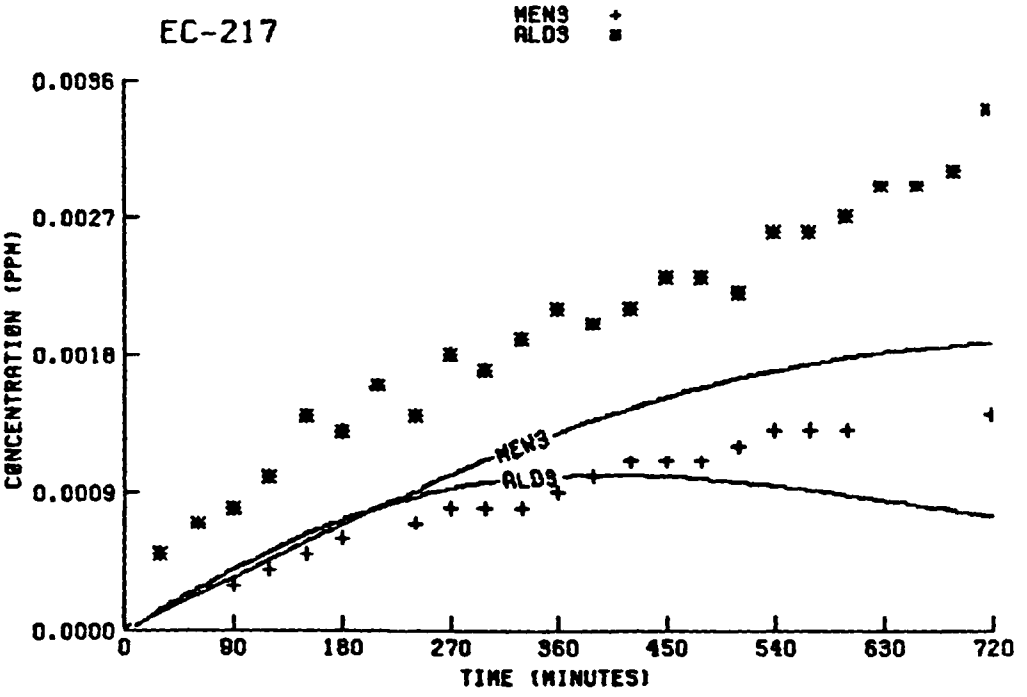

EC-216
PAN ■
0.20
0.15
0.10
0.05
0.00
CONCENTRATION (PPM)
PAN
0
65
130
195
260
325
390
455
520
TIME (MINUTES)

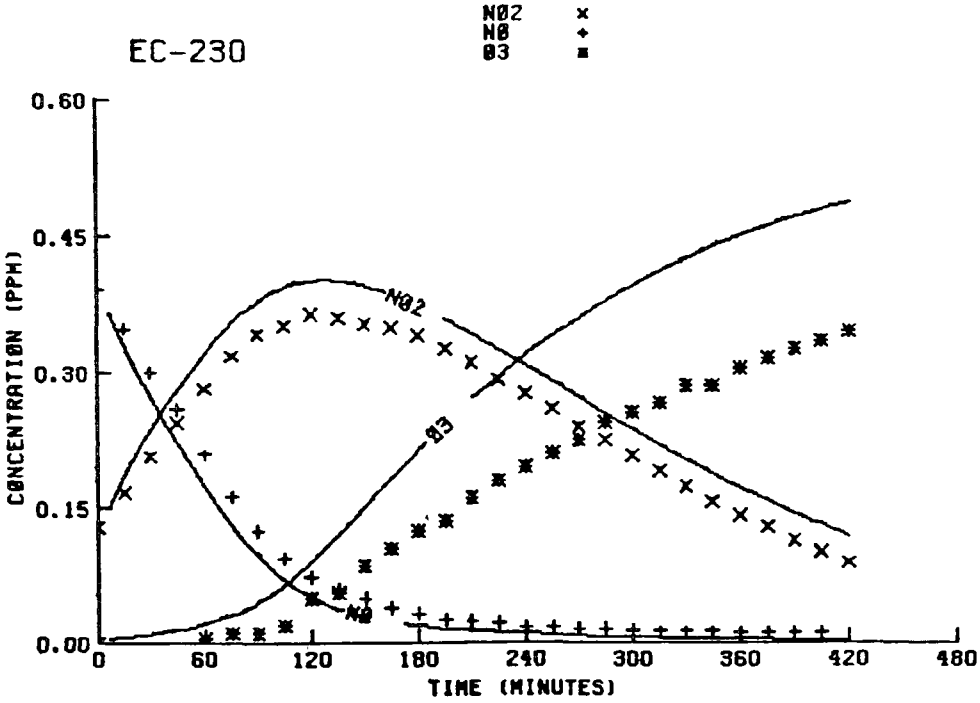

EC-216
MEN3
ALD3
0.0044
0.0033
0.0022
0.0011
0.0000
CONCENTRATION (PPM)
ALD3
MEN3
0
65
130
195
260
325
390
455
520
TIME (MINUTES)

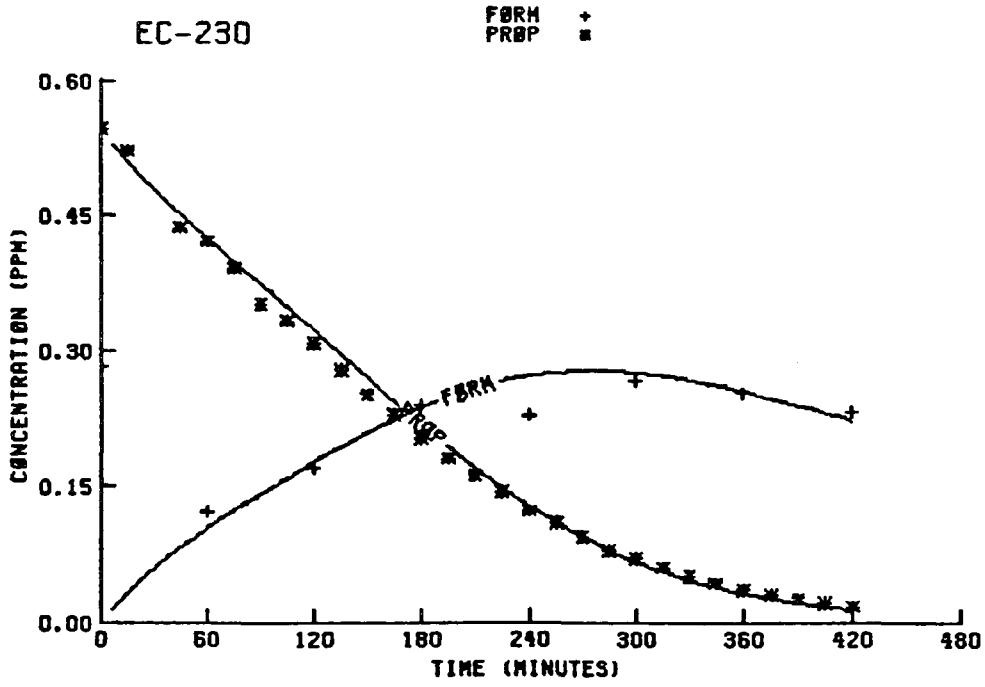

EC-217
NO2
NO
O3
0.32
0.24
0.16
0.08
0.00
CONCENTRATION (PPM)
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

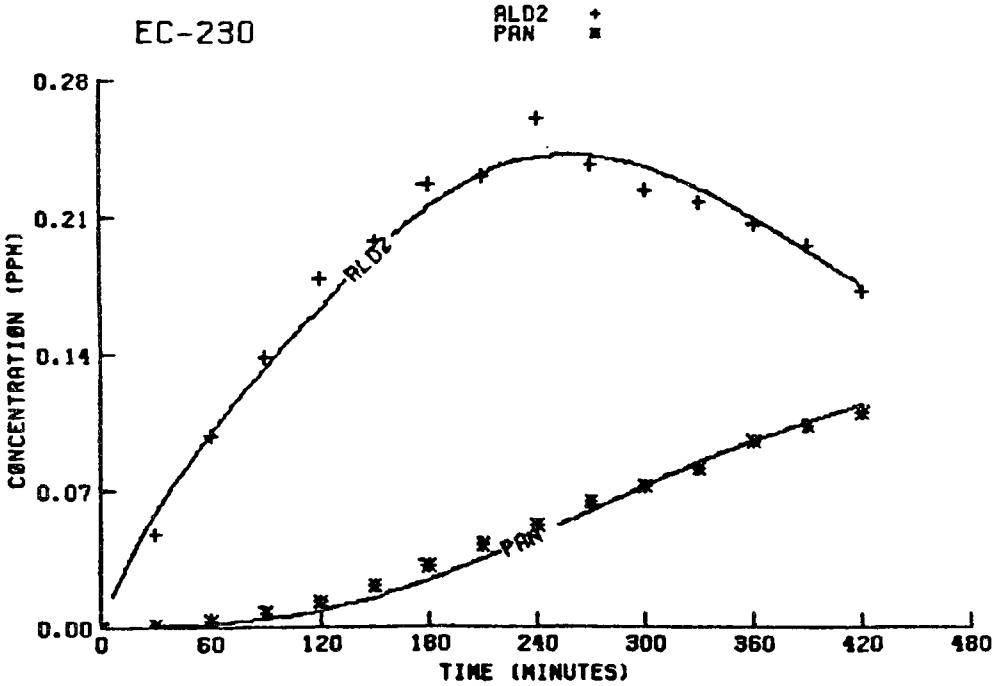

EC-217
ALD2
PROP
0.16
0.12
0.08
0.04
0.00
CONCENTRATION (PPM)
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

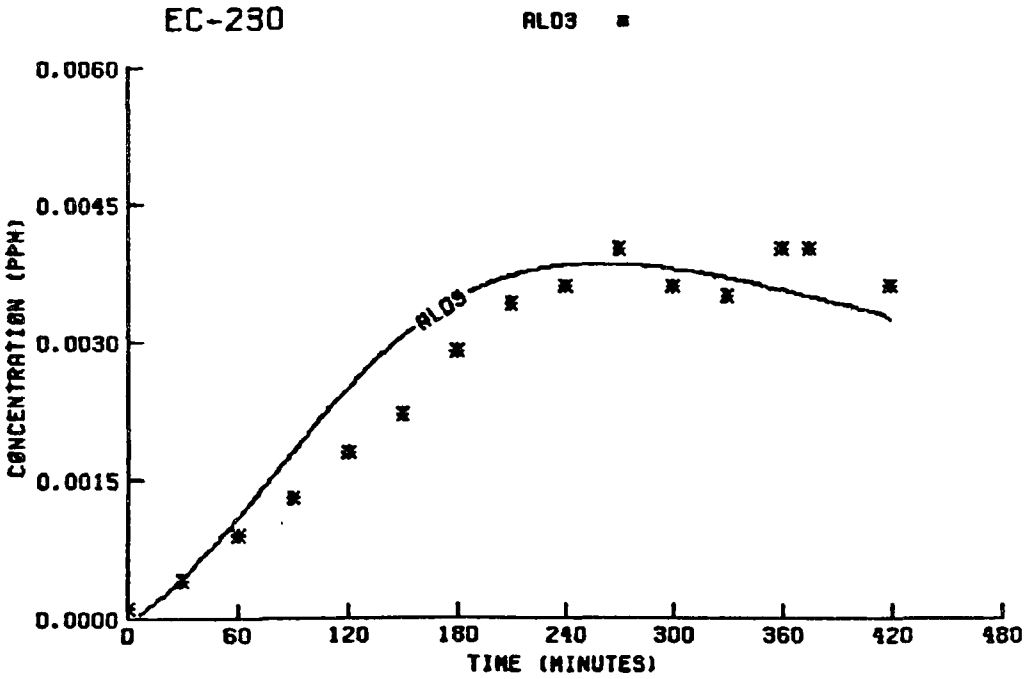

EC-217
FORM
PAN
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
FORM
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

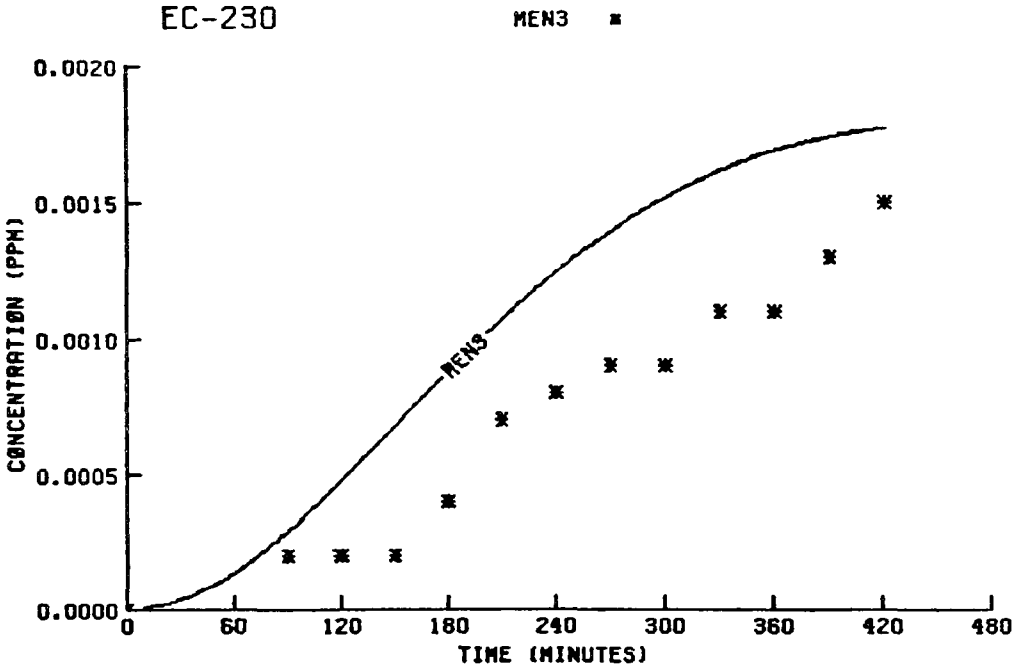

EC-217
MEN3
ALD3
0.0036
0.0027
0.0018
0.0009
0.0000
CONCENTRATION (PPM)
MEN3
ALD3
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

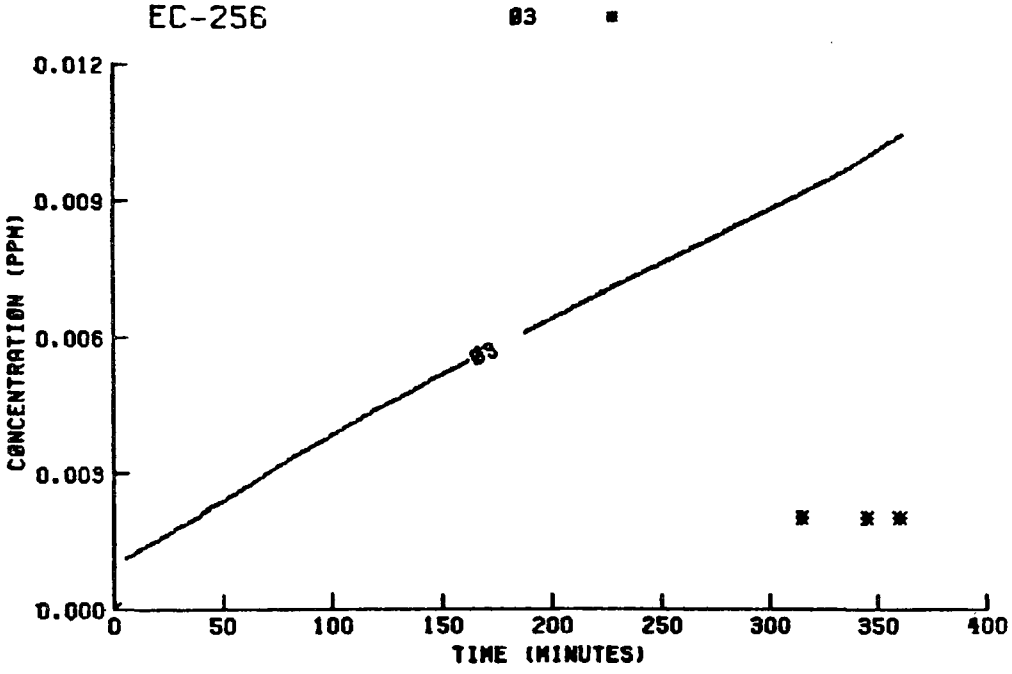

EC-230
NØ2
NØ
Ø3
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPH)
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

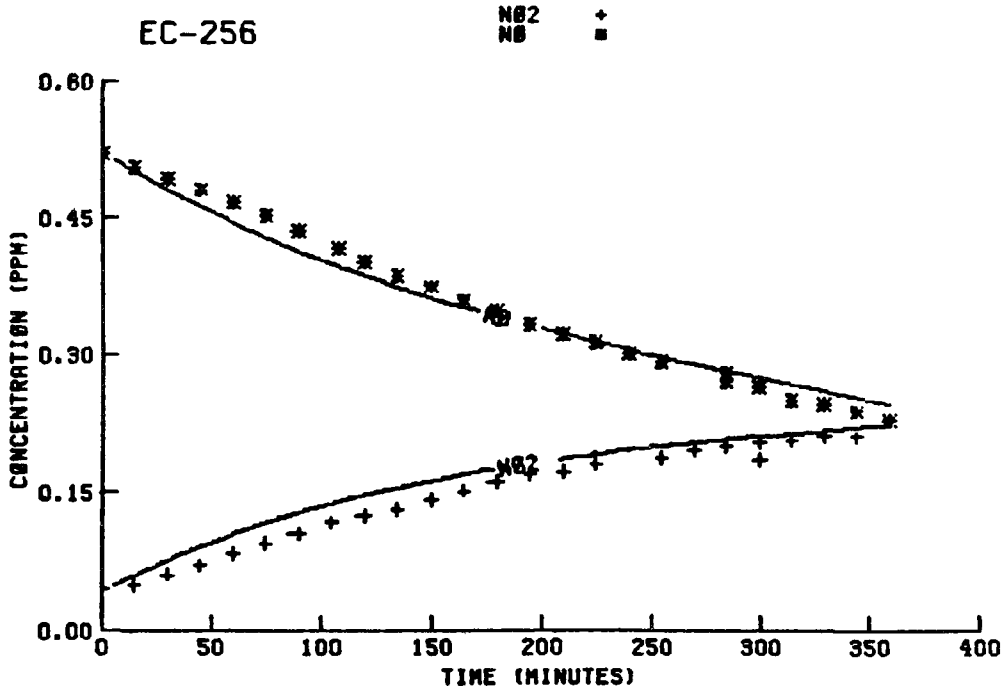

EC-230
FØRM
PRØP
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPH)
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

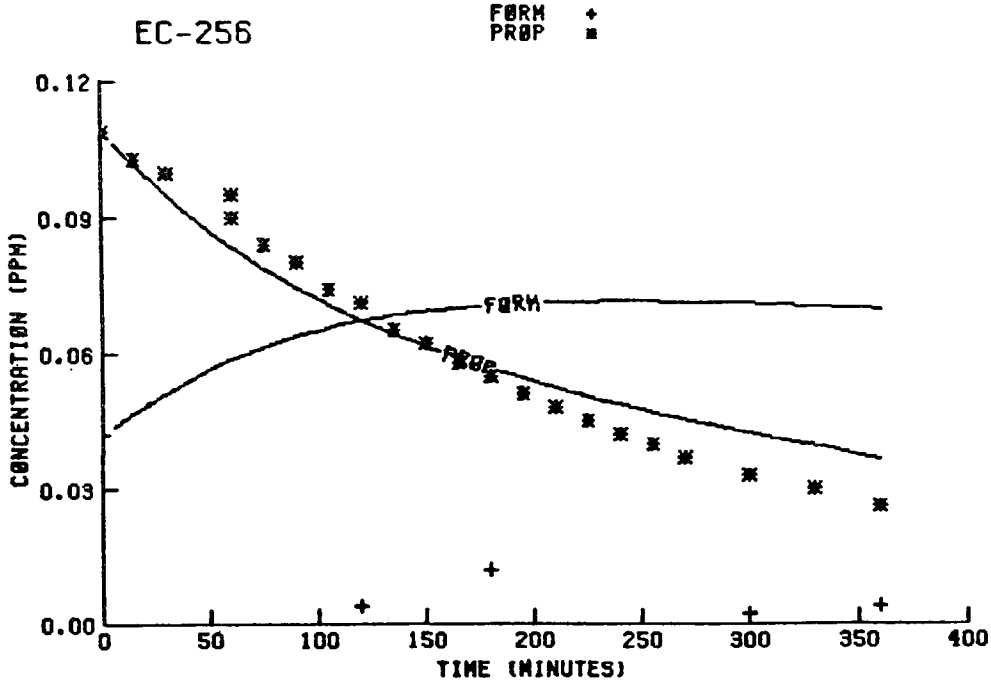

EC-230
ALD2 +
PAN *
0.28
0.21
0.14
0.07
0.00
CONCENTRATION (PPM)
ALD2
PAN
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

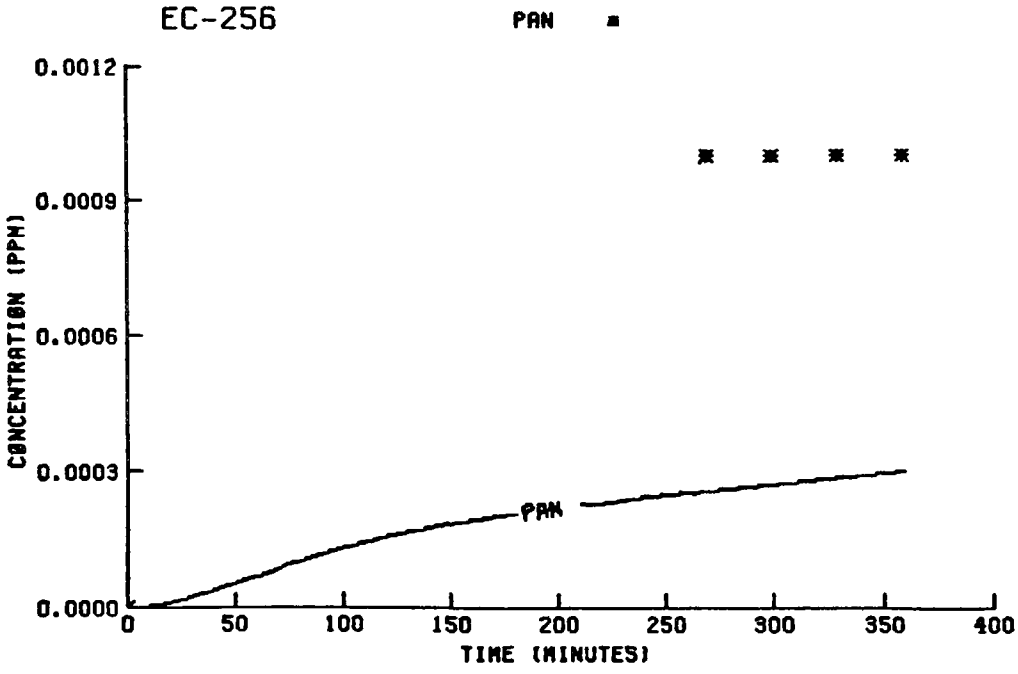

EC-230
ALD3 *
0.0060
0.0045
0.0030
0.0015
0.0000
CONCENTRATION (PPM)
ALD3
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

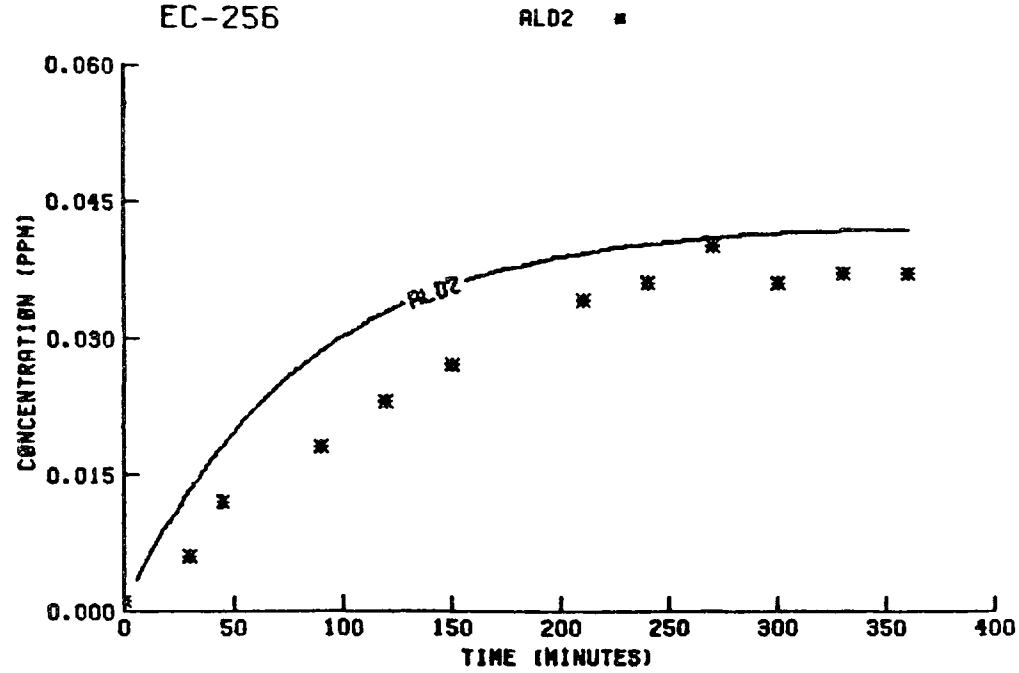

EC-230
MEN3
0.0020
0.0015
0.0010
0.0005
0.0000
CONCENTRATION (PPM)
MEN3
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

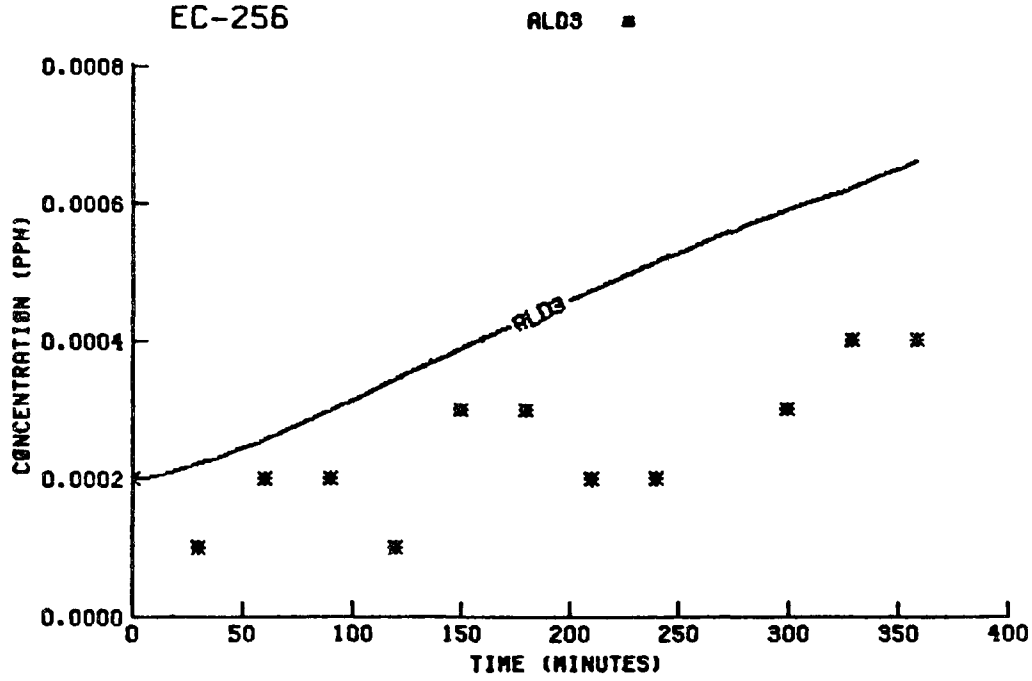

EC-256
03
0.012
0.009
0.006
0.003
0.000
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

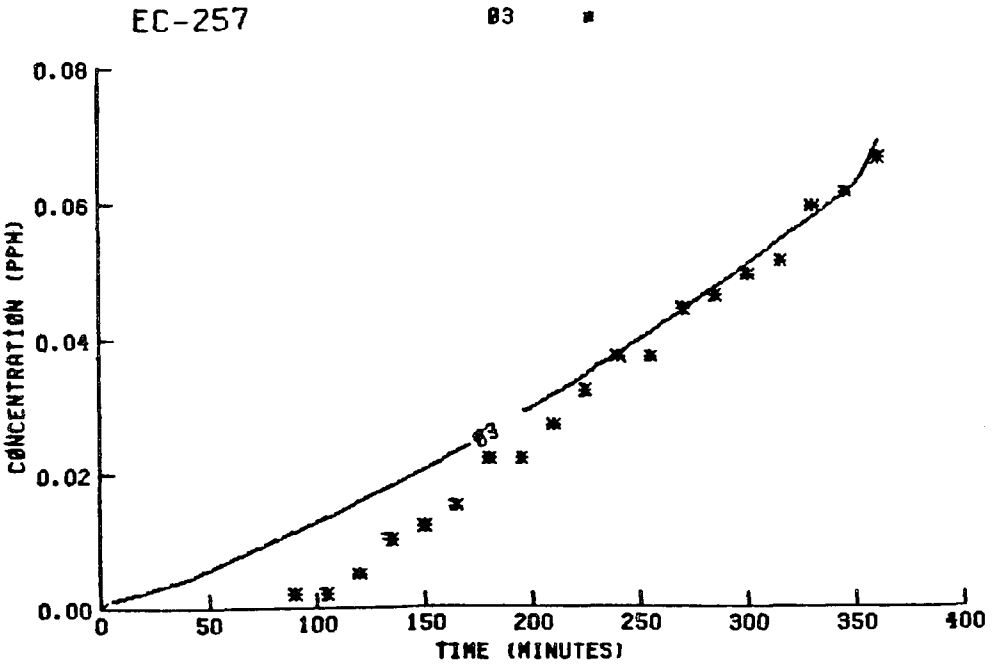

EC-256
NO2
NO
0.60
0.45
0.30
0.15
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

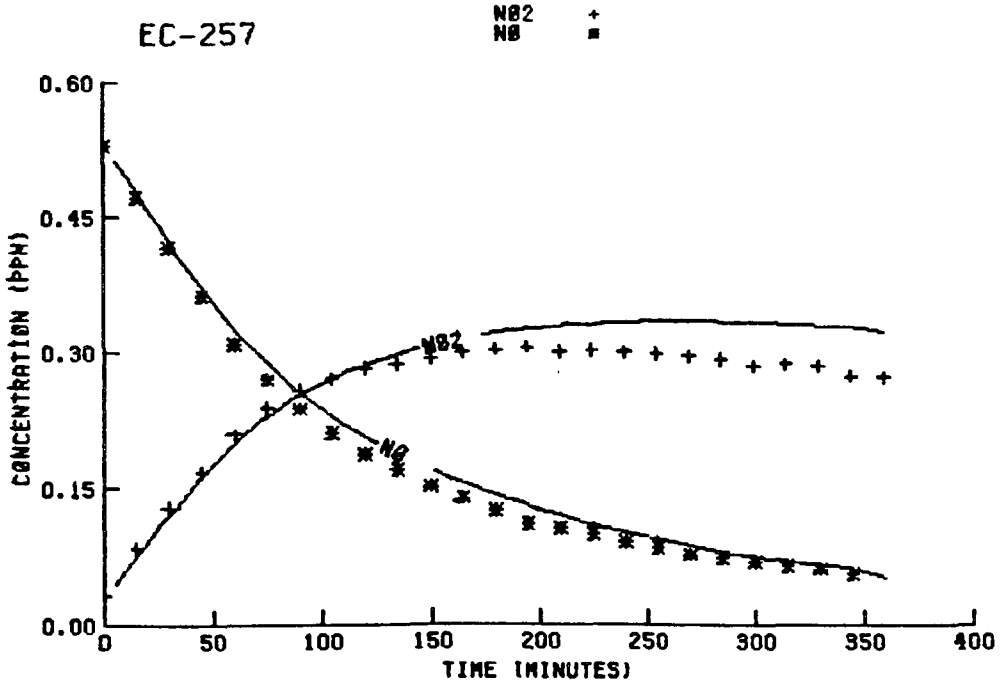

EC-256
FORM +
PROP ■
0.12
0.09
0.06
0.03
0.00
CONCENTRATION (PPM)
FORM
PROP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

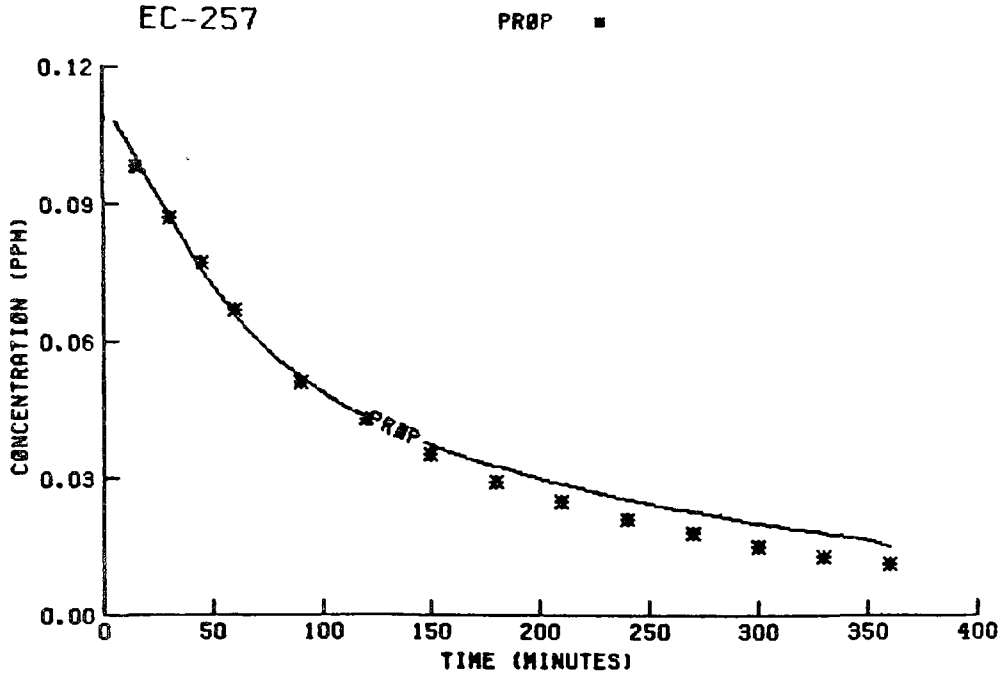

EC-256
PAN ■
0.0012
0.0009
0.0006
0.0003
0.0000
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

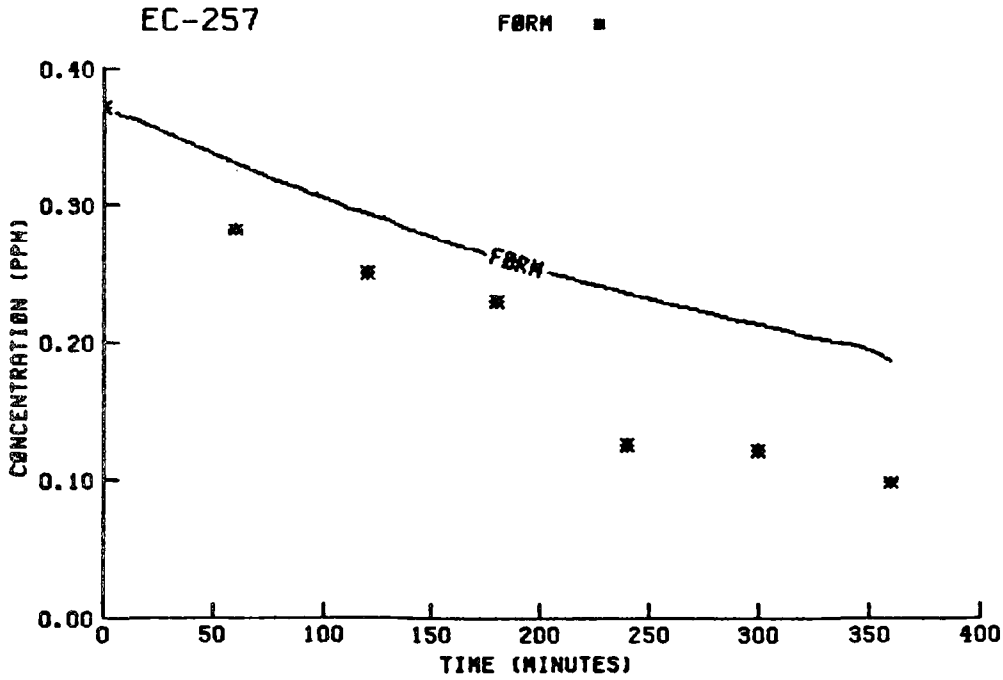

EC-256
ALD2
0.060
0.045
0.030
0.015
0.000
CONCENTRATION (PPM)
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

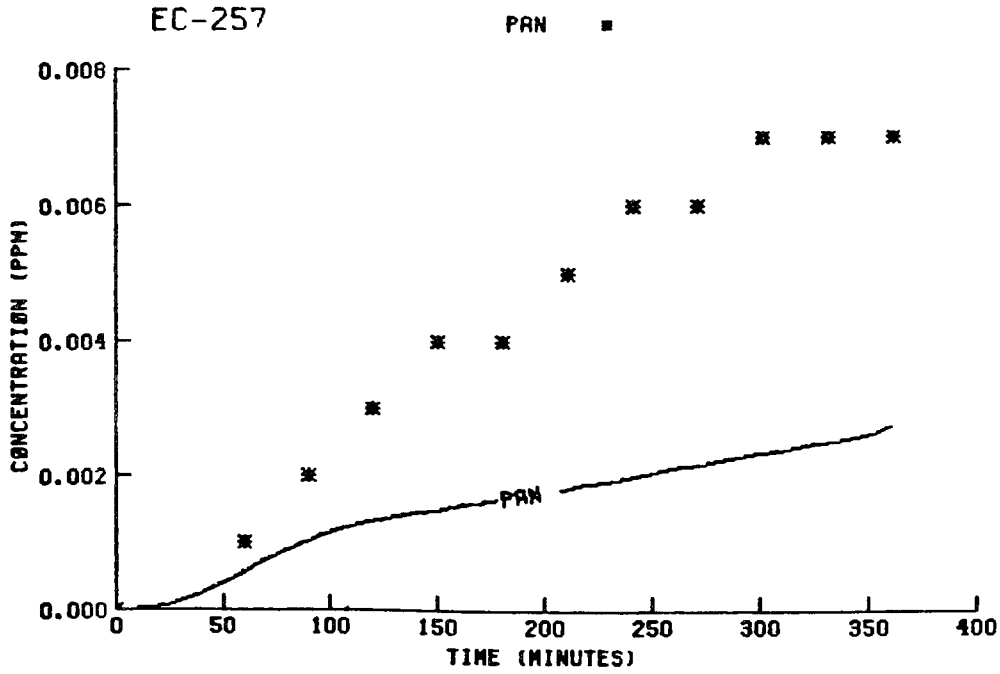

EC-256
ALD3
0.0008
0.0006
0.0004
0.0002
0.0000
CONCENTRATION (PPM)
ALD3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

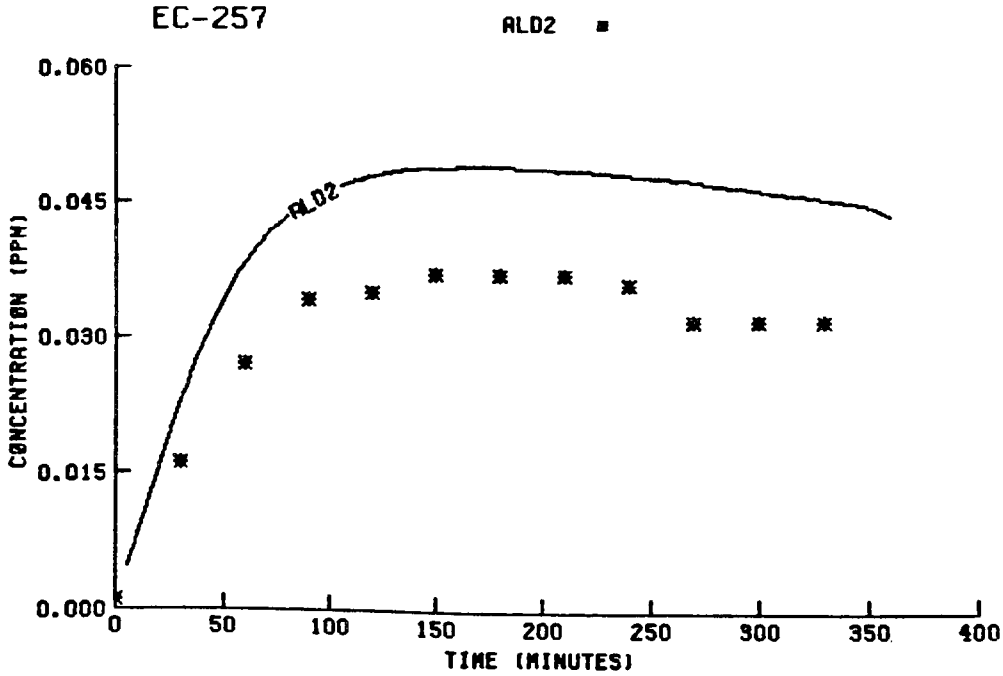

EC-257
03
CONCENTRATION (PPM)
0.08
0.06
0.04
0.02
0.00
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

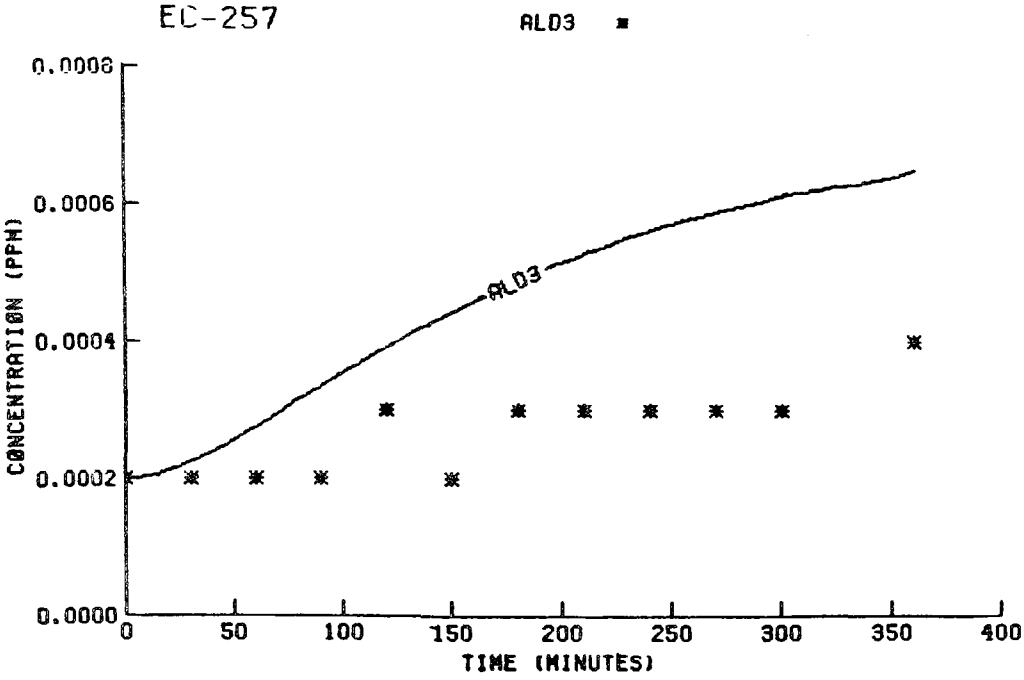

EC-257
NO2
NO
CONCENTRATION (PPM)
0.60
0.45
0.30
0.15
0.00
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

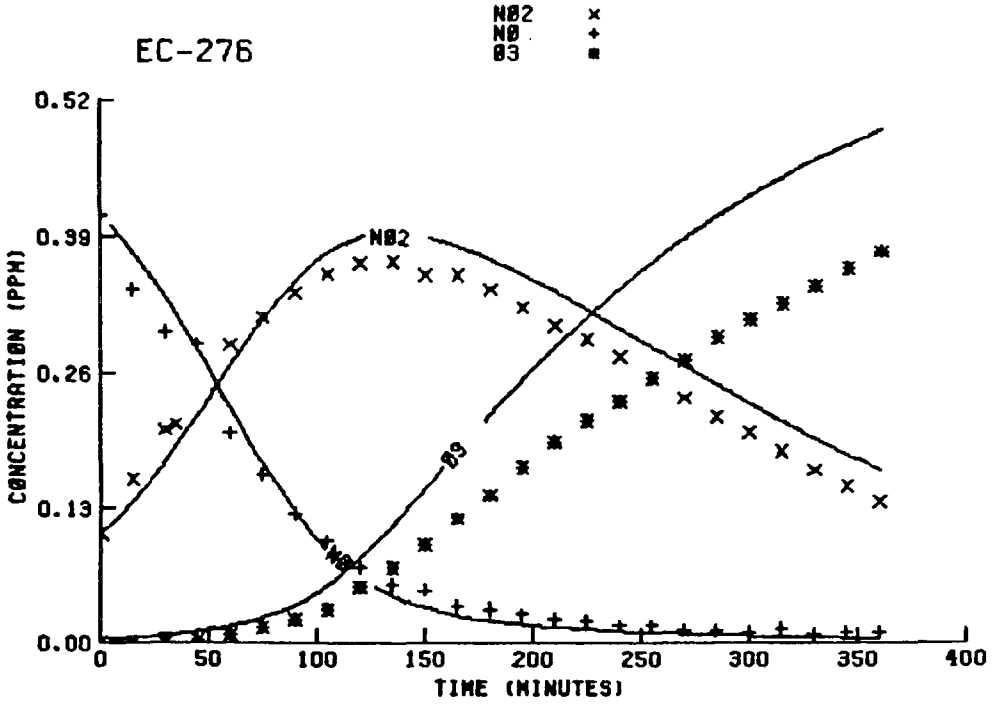

EC-257
PR0P
0.12
0.09
0.06
0.03
0.00
CONCENTRATION (PPM)
PR0P
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

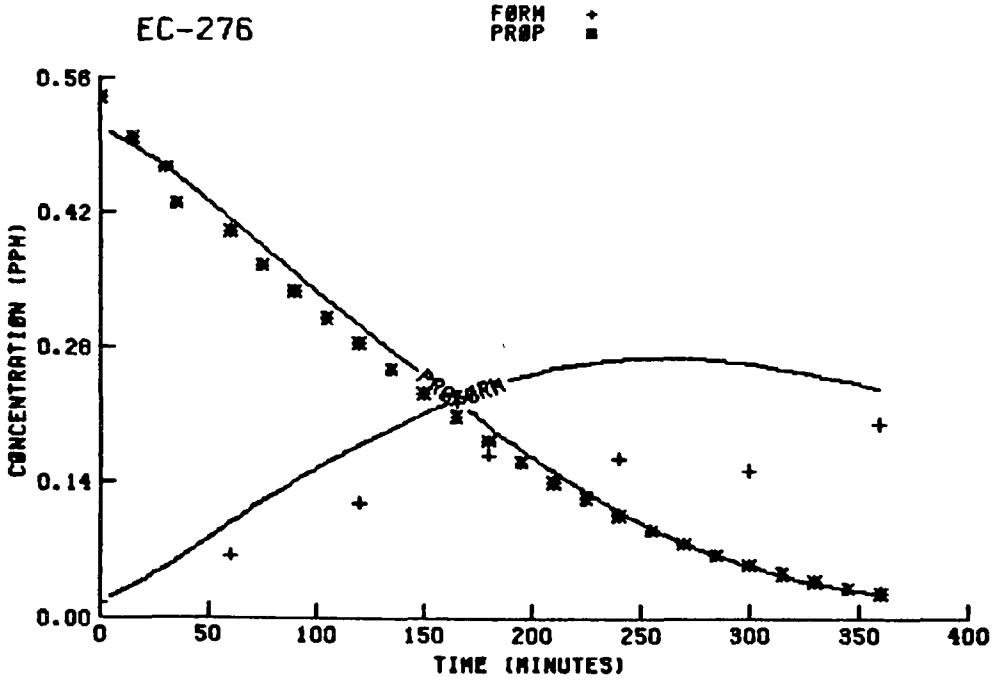

EC-257
F0RM
0.40
0.30
0.20
0.10
0.00
CONCENTRATION (PPM)
F0RM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

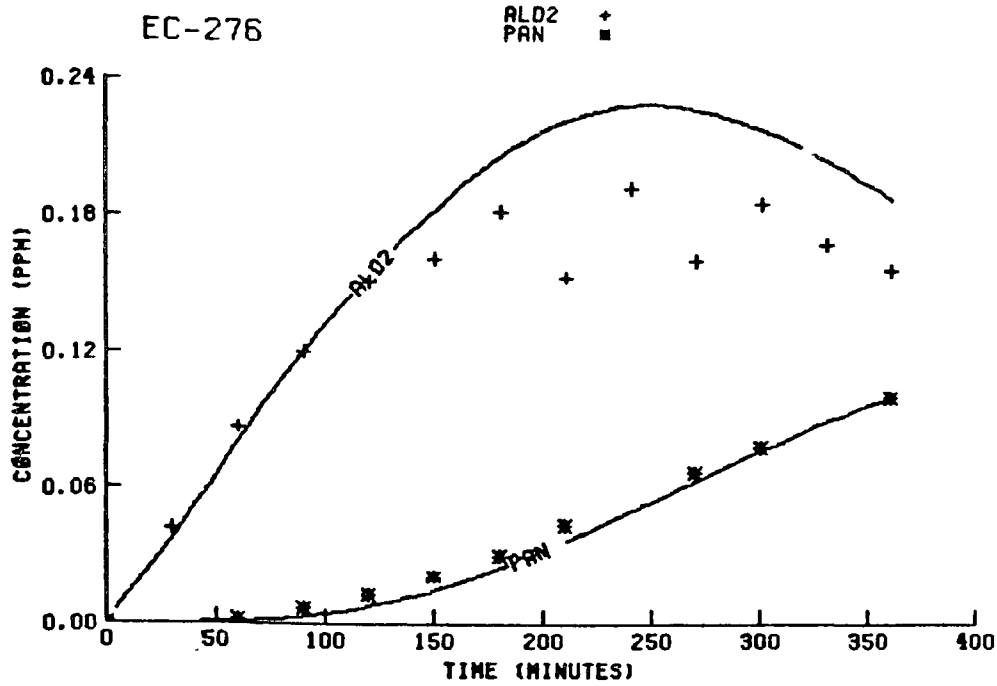

EC-257
PAN
0.008
0.006
0.004
0.002
0.000
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

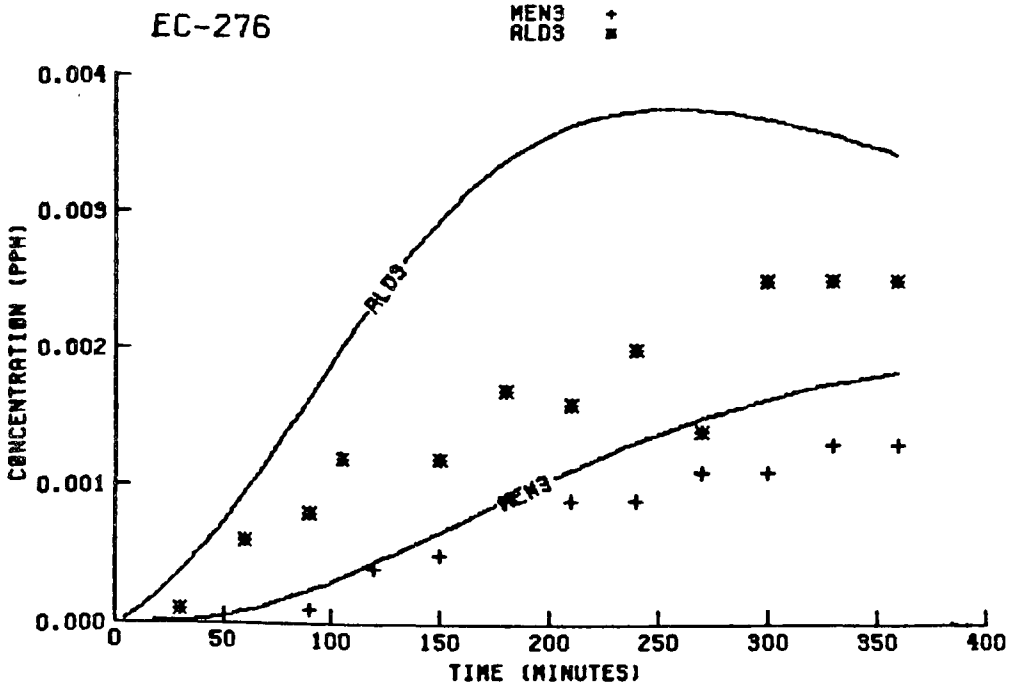

EC-257
ALD2
0.060
0.045
0.030
0.015
0.000
CONCENTRATION (PPM)
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

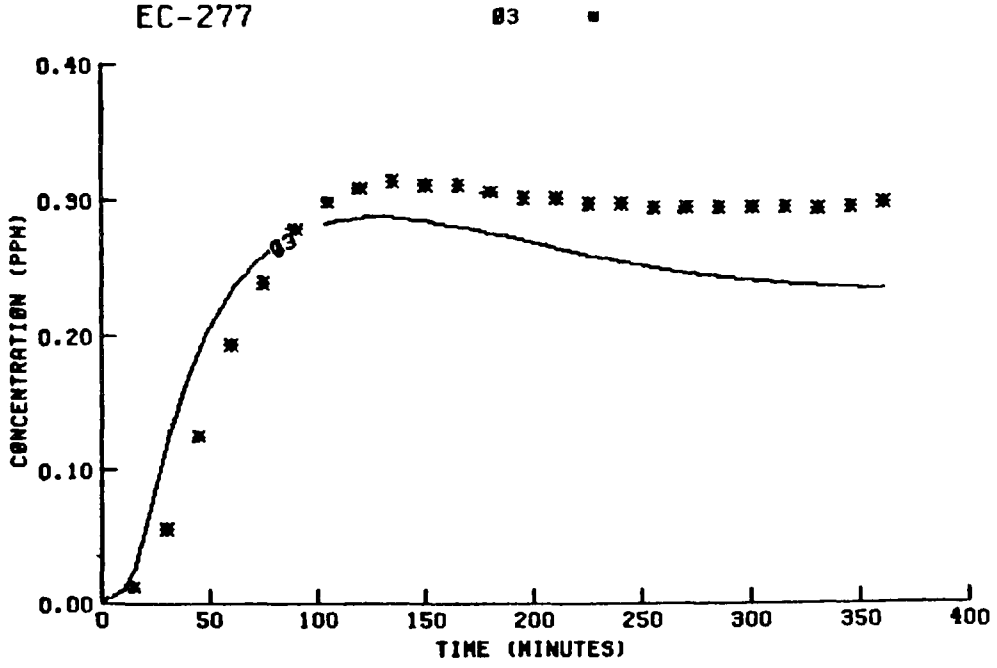

EC-257
ALD3
0.0008
0.0006
0.0004
0.0002
0.0000
CONCENTRATION (PPM)
ALD3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

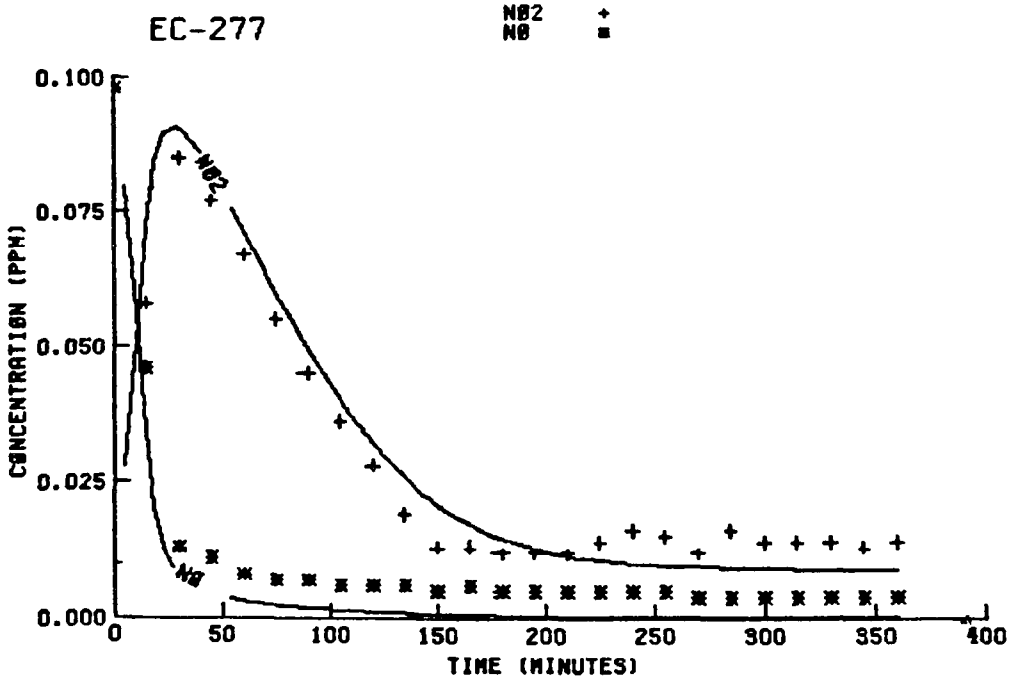

EC-276
NØ2
NØ
Ø3
0.52
0.39
0.26
0.13
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

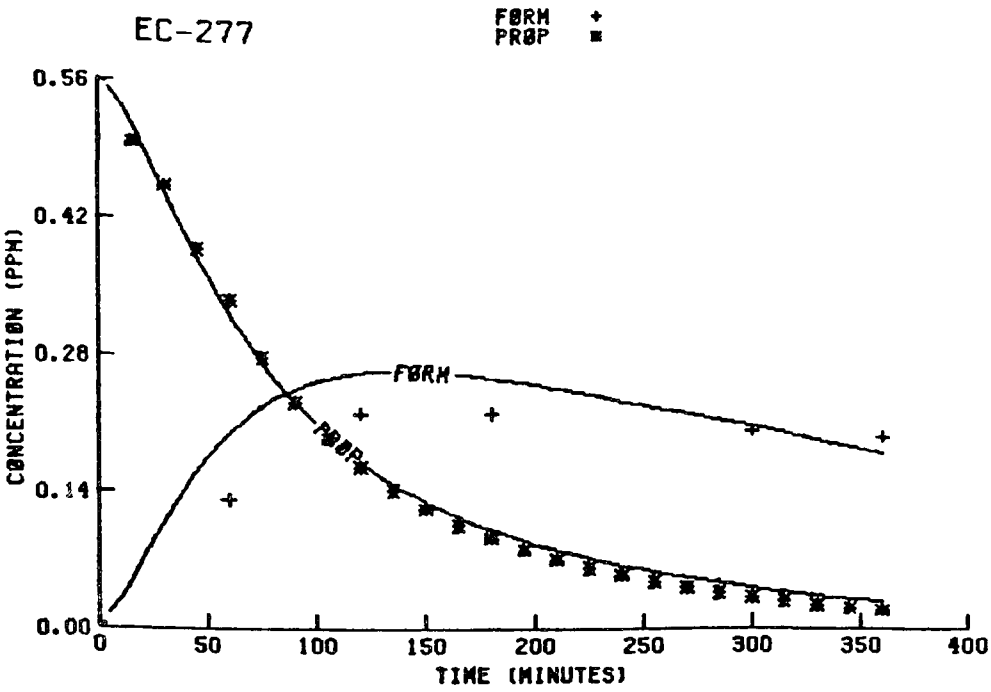

EC-276
FØRM
PRØP
0.56
0.42
0.28
0.14
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

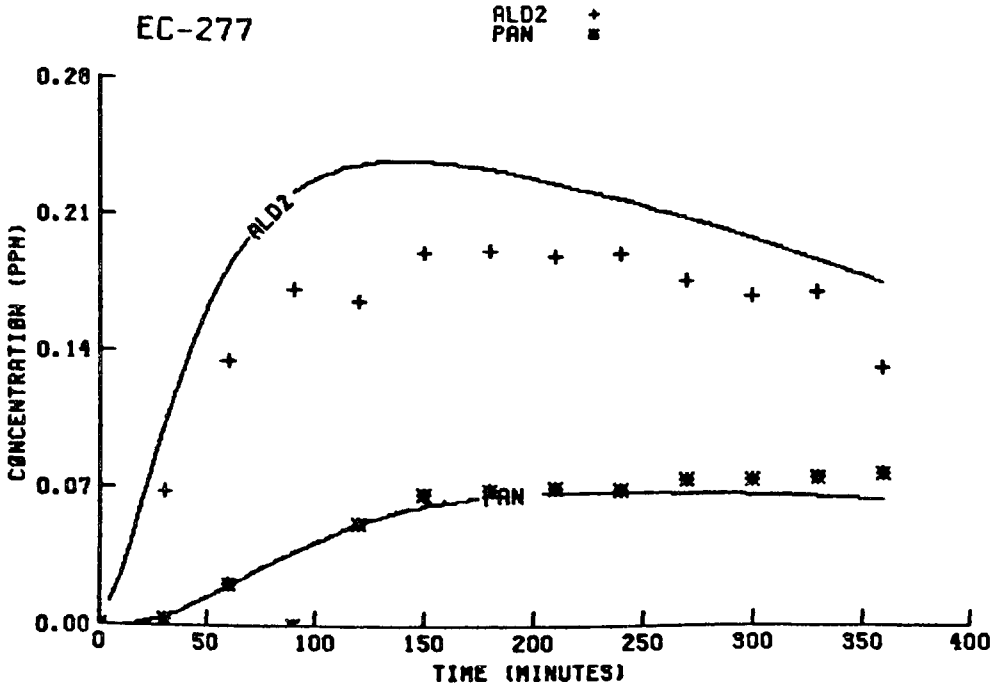

EC-276
ALD2
PAN
0.24
0.18
0.12
0.06
0.00
CONCENTRATION (PPM)
ALD2
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

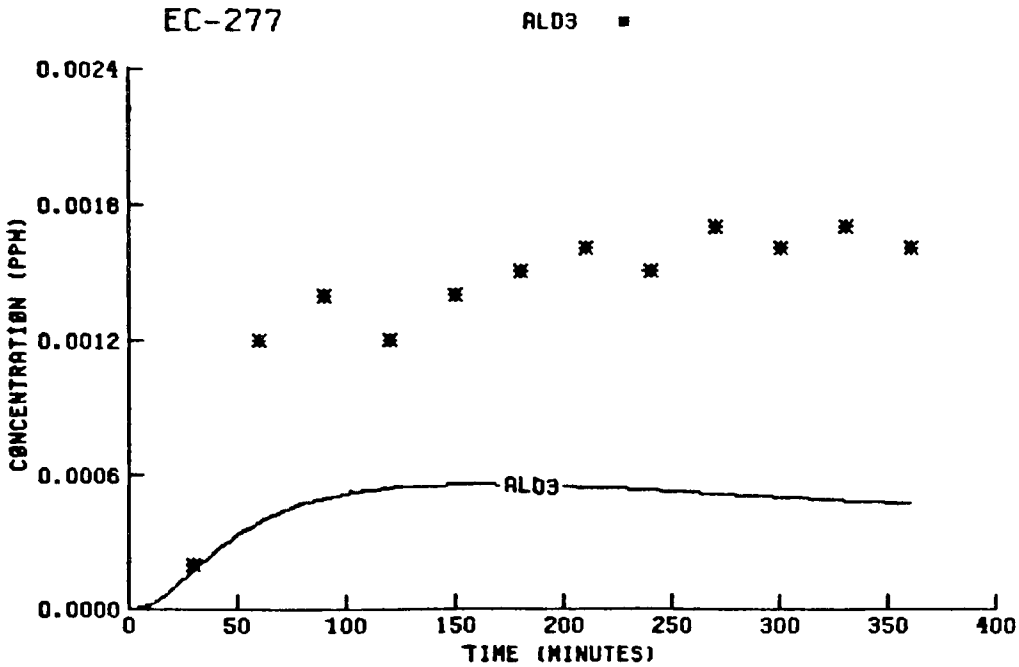

EC-276
MEN3
ALD3
0.004
0.003
0.002
0.001
0.000
CONCENTRATION (PPM)
ALD3
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

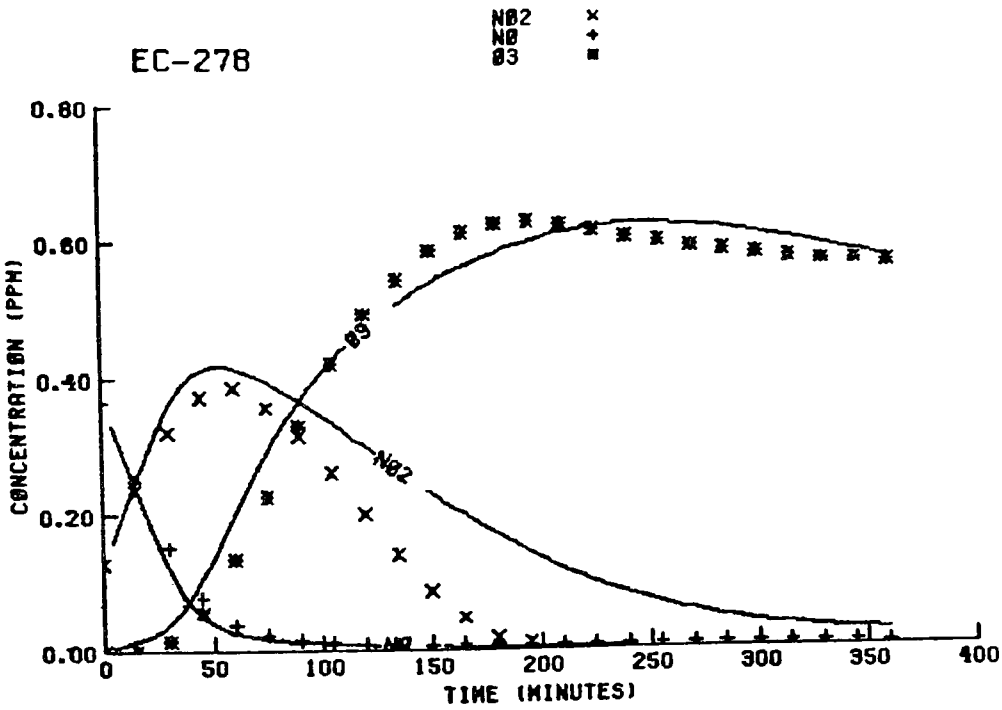

EC-277
03
0.40
0.90
0.20
0.10
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

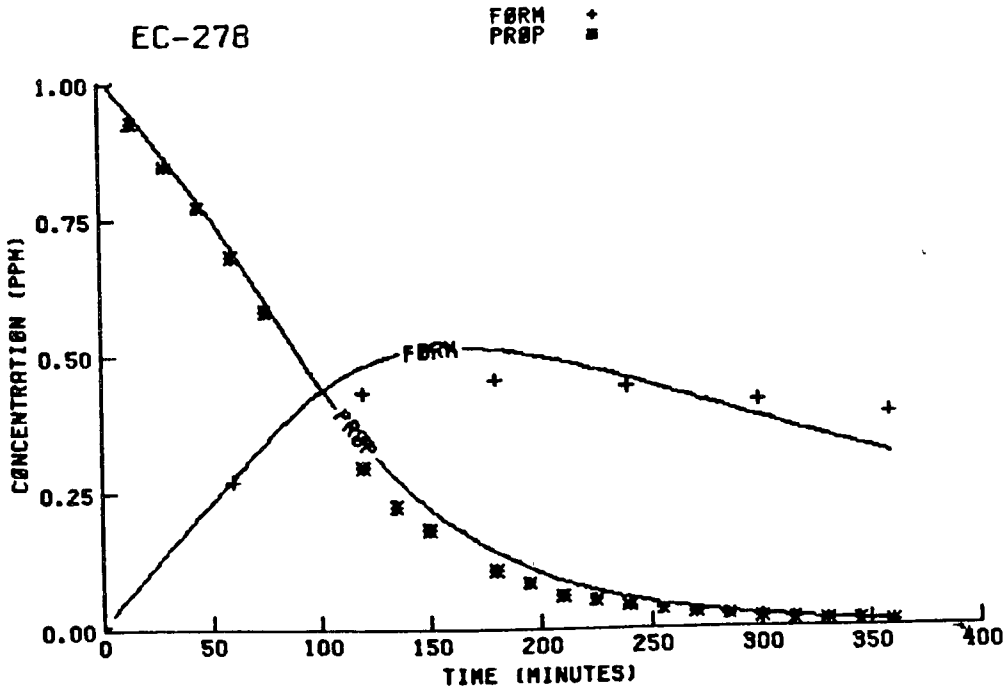

EC-277
NO2
NO
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

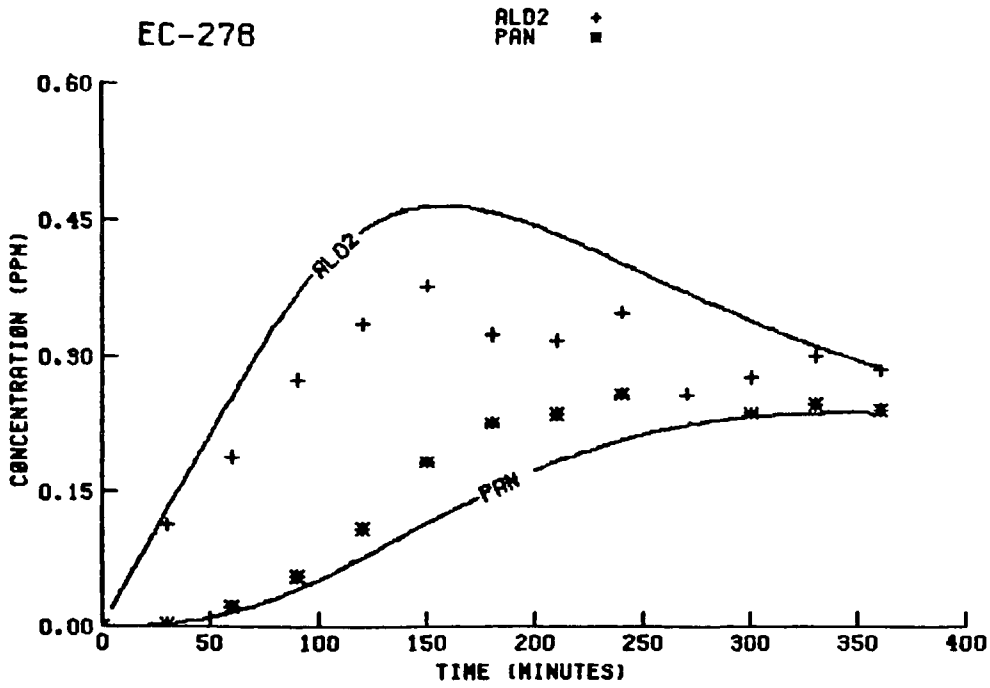

EC-277
FORM +
PROP ■
0.56
0.42
0.28
0.14
0.00
CONCENTRATION (PPM)
FORM
PROP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

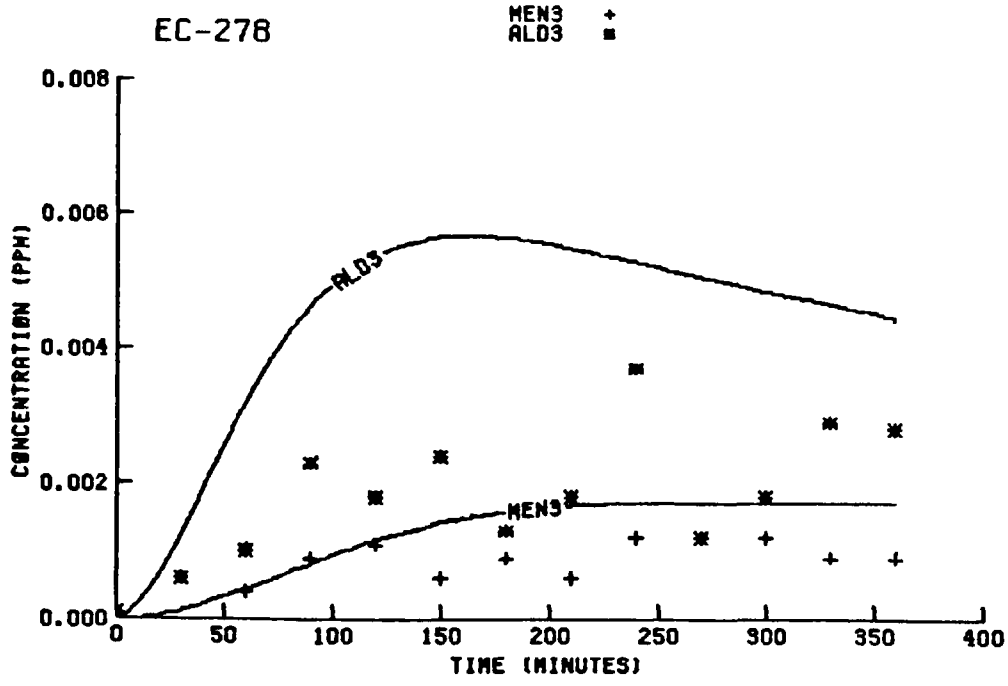

EC-277
ALD2 +
PAN ■
0.28
0.21
0.14
0.07
0.00
CONCENTRATION (PPM)
ALD2
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

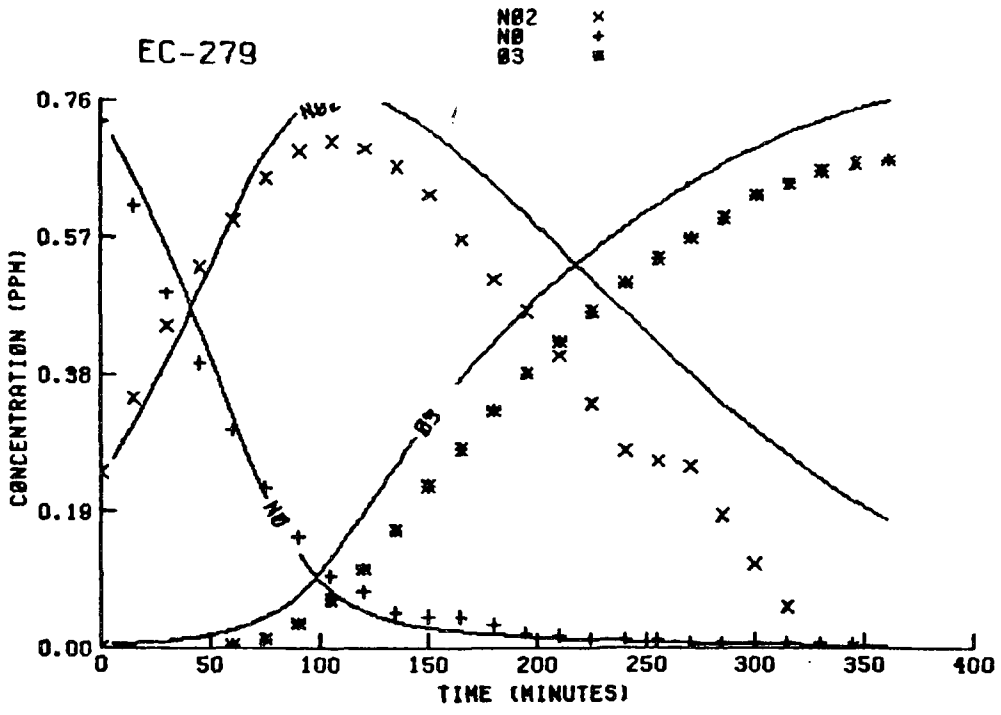

EC-277
ALD3
0.0024
0.0018
0.0012
0.0006
0.0000
CONCENTRATION (PPM)
ALD3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

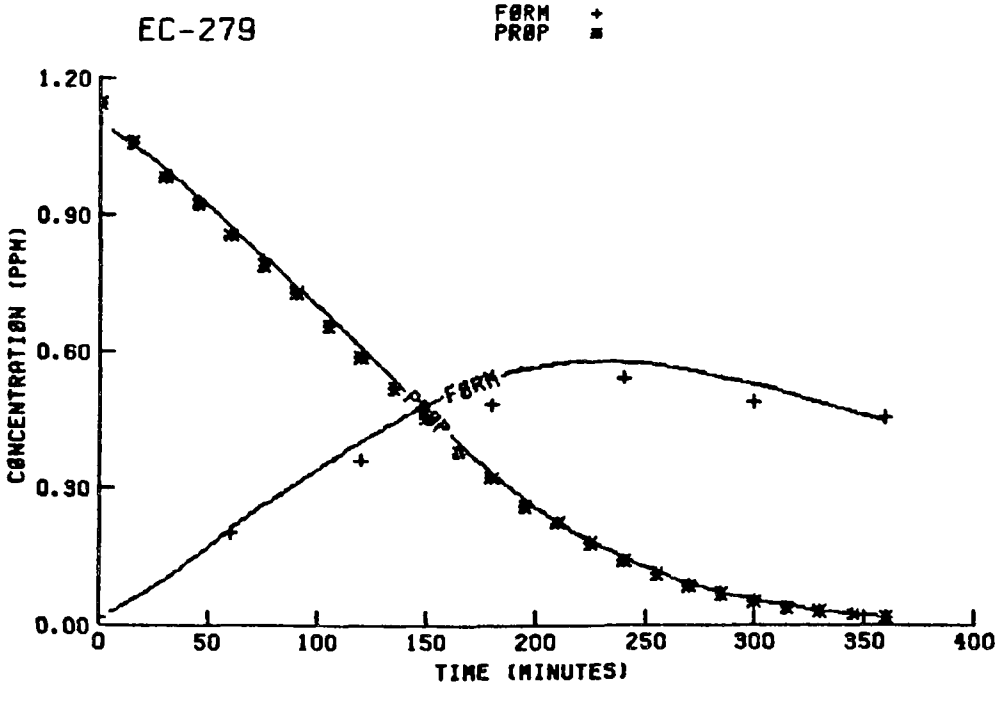

EC-278
NØ2
NØ
Ø3
CØNCENTRATIØN (PPM)
0.80
0.60
0.40
0.20
0.00
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
Ø3
NØ2

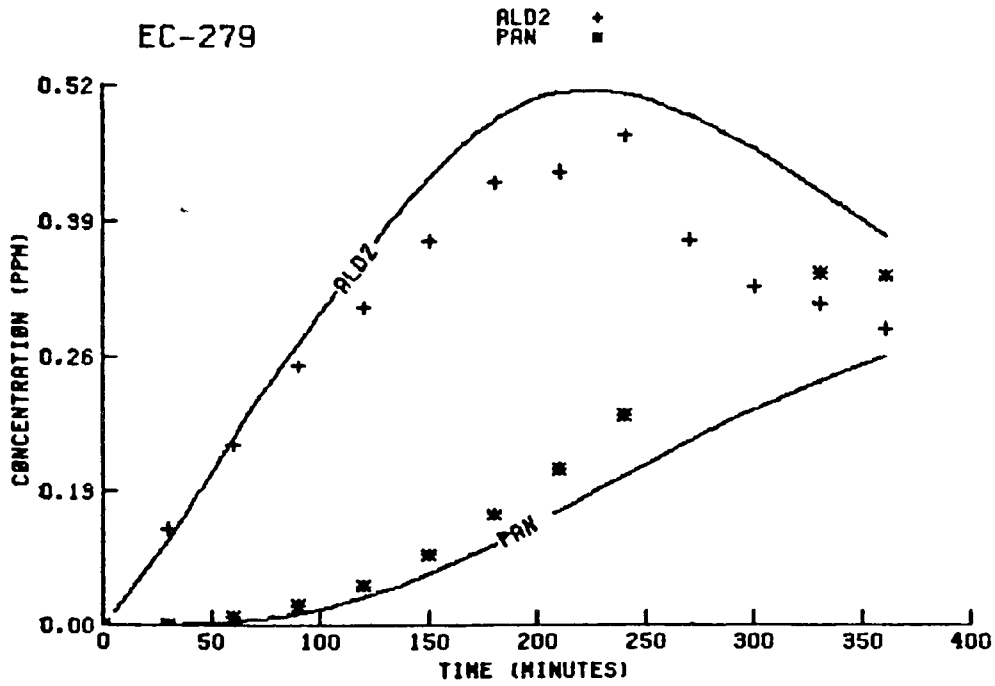

EC-278
FØRM
PRØP
CØNCENTRATIØN (PPM)
1.00
0.75
0.50
0.25
0.00
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
FØRM
PRØP

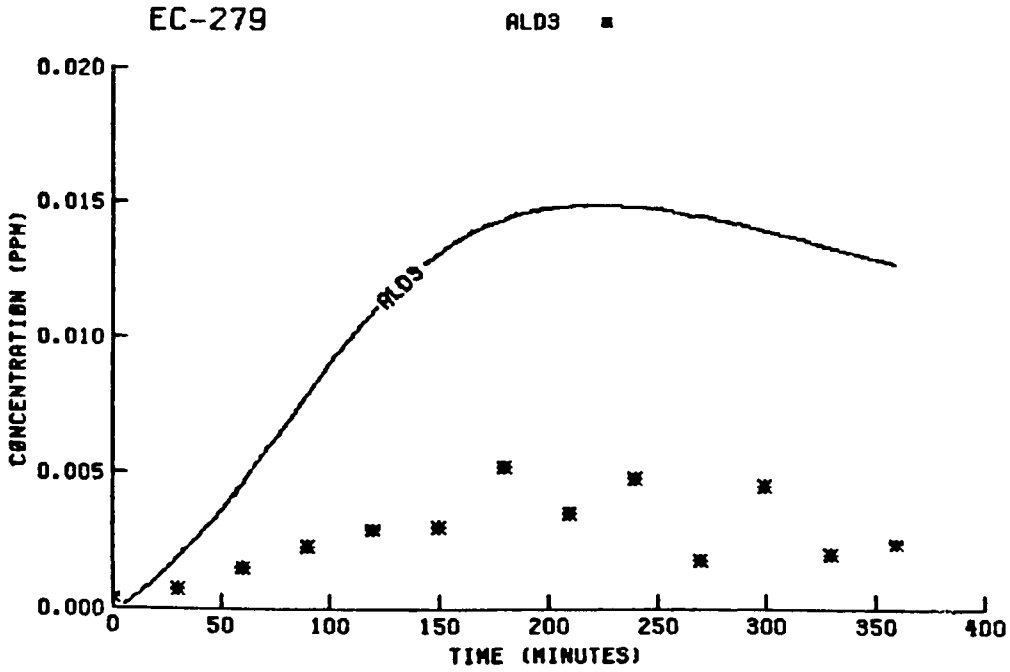

EC-278
ALD2
PAN
0.60
0.45
0.90
0.15
0.00
CONCENTRATION (PPM)
ALD2
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

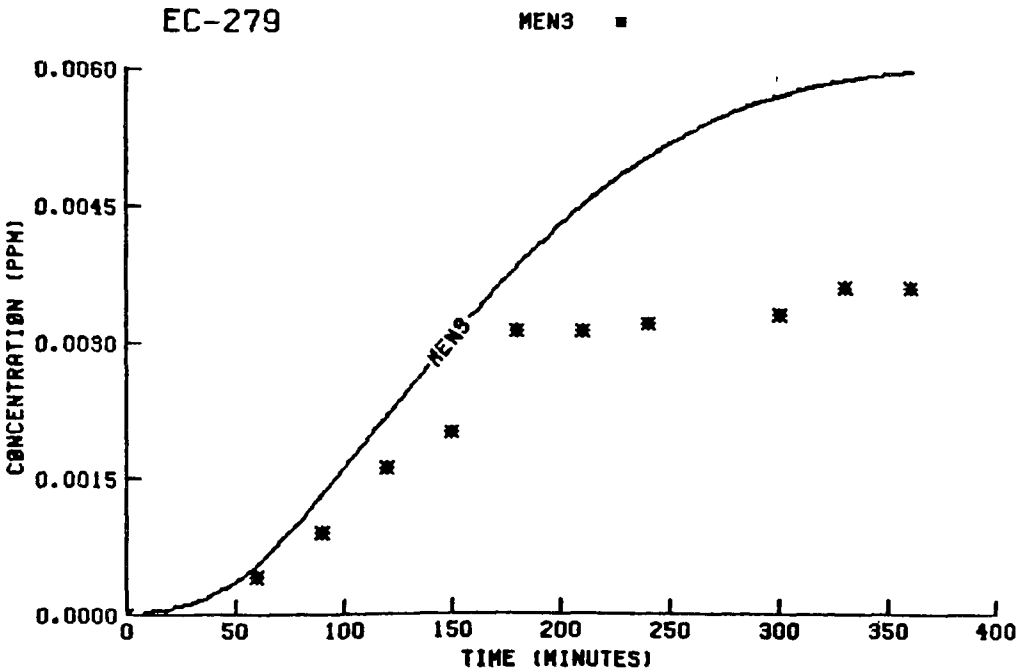

EC-278
MEN3
ALD3
0.008
0.006
0.004
0.002
0.000
CONCENTRATION (PPM)
ALD3
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-279
NØ2 ×
NØ +
Ø3 ≡
0.76
0.57
0.38
0.19
0.00
CØNCENTRATIØN (PPH)
NØ2
NØ
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

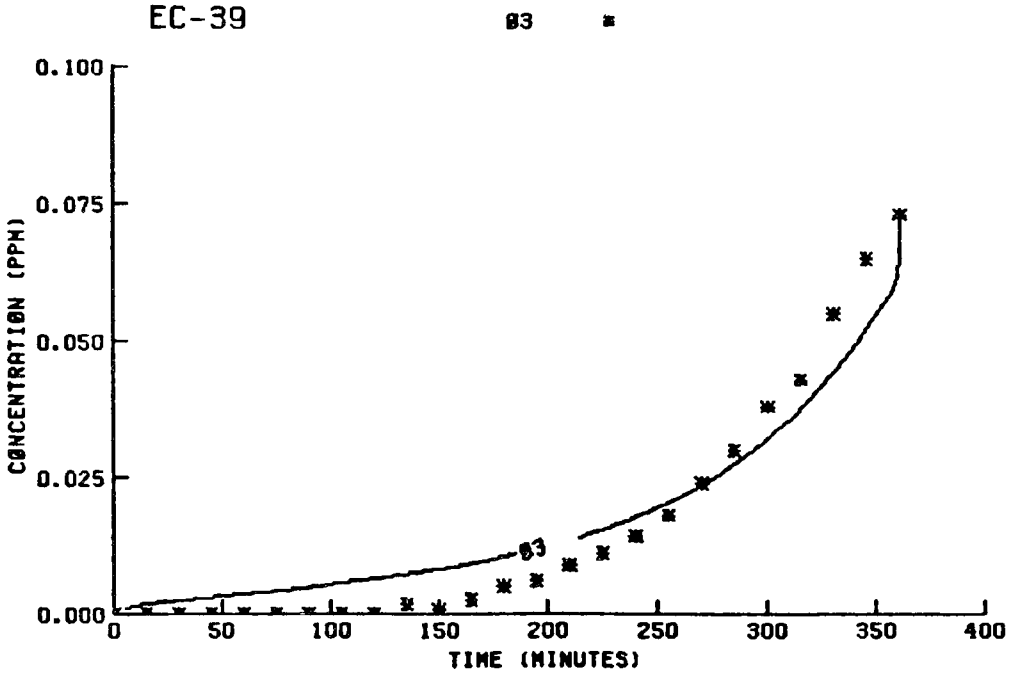

EC-279
FØRM +
PRØP ≡
1.20
0.90
0.60
0.30
0.00
CØNCENTRATIØN (PPH)
FØRM
PRØP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

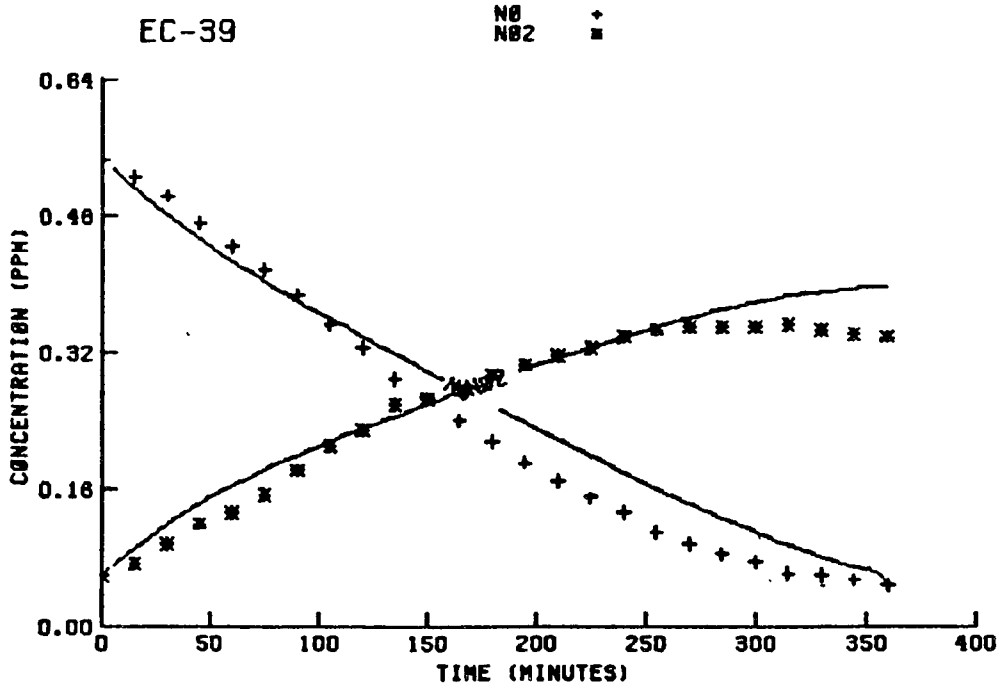

EC-279
ALD2
PAN
0.52
0.39
0.26
0.19
0.00
CONCENTRATION (PPM)
ALD2
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

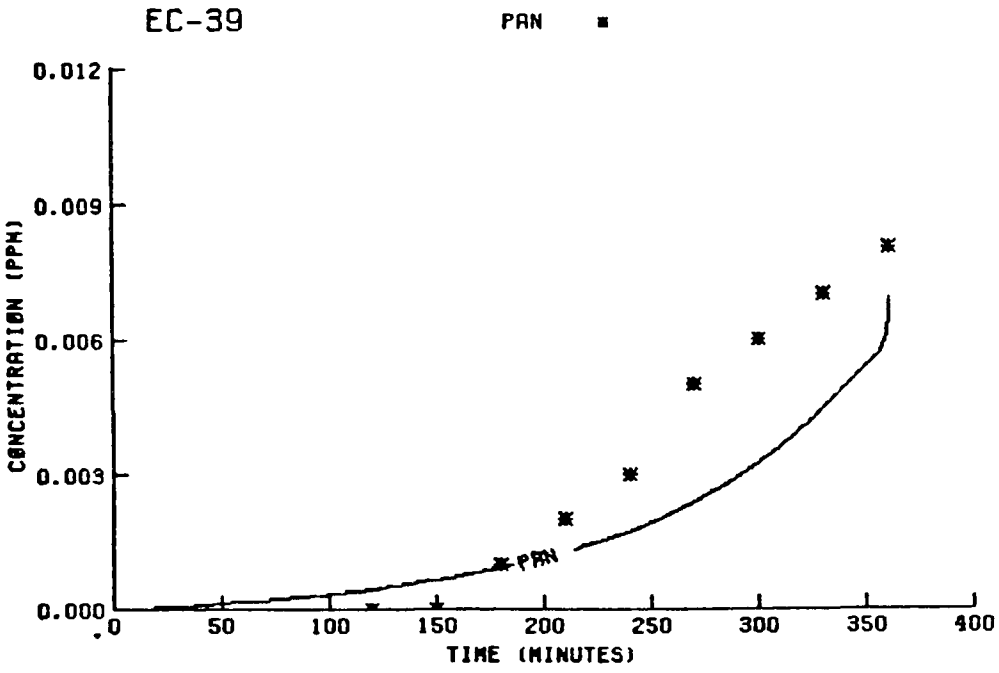

EC-279
ALD3
0.020
0.015
0.010
0.005
0.000
CONCENTRATION (PPM)
ALD3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

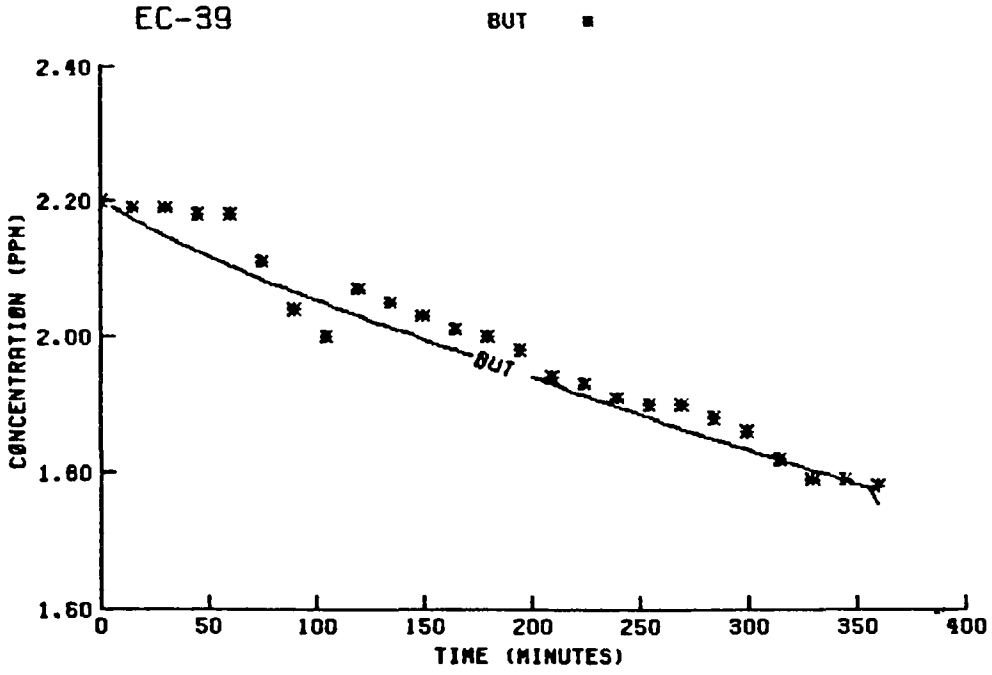

EC-279
MEN3
0.0060
0.0045
0.0030
0.0015
0.0000
CONCENTRATION (PPM)
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

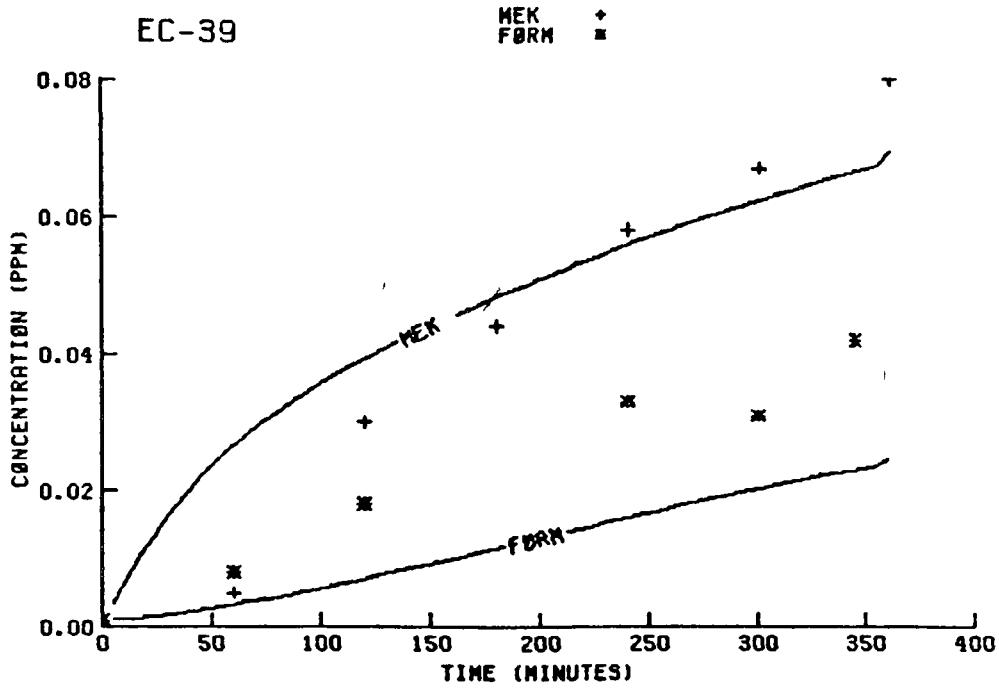
UCR BUTANE EXPERIMENTS

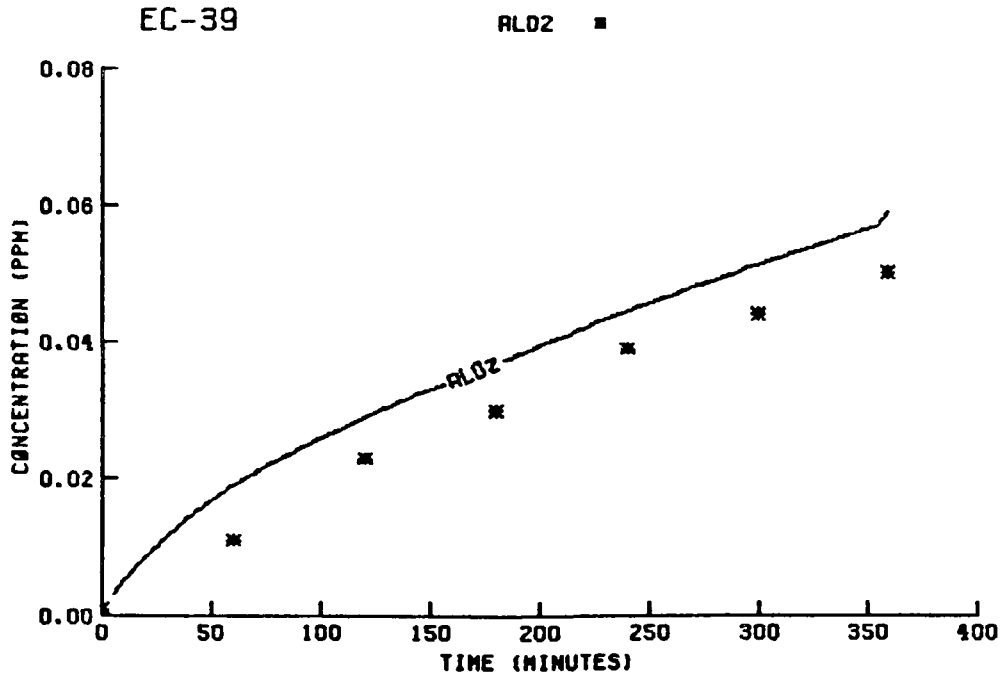

EC-39
03
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

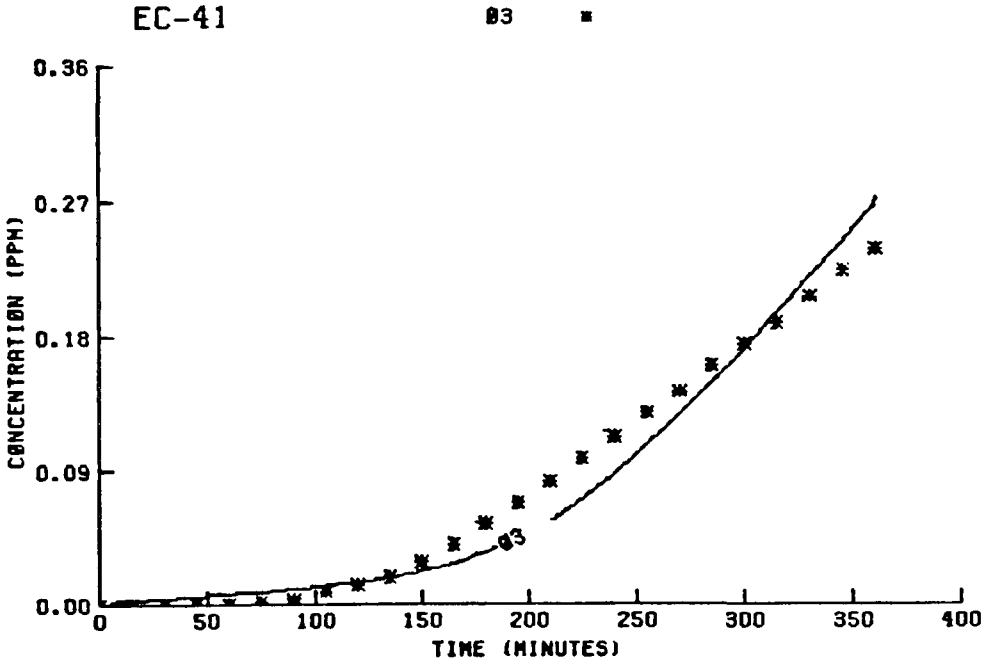

EC-39
NO
NO2
0.64
0.48
0.32
0.16
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

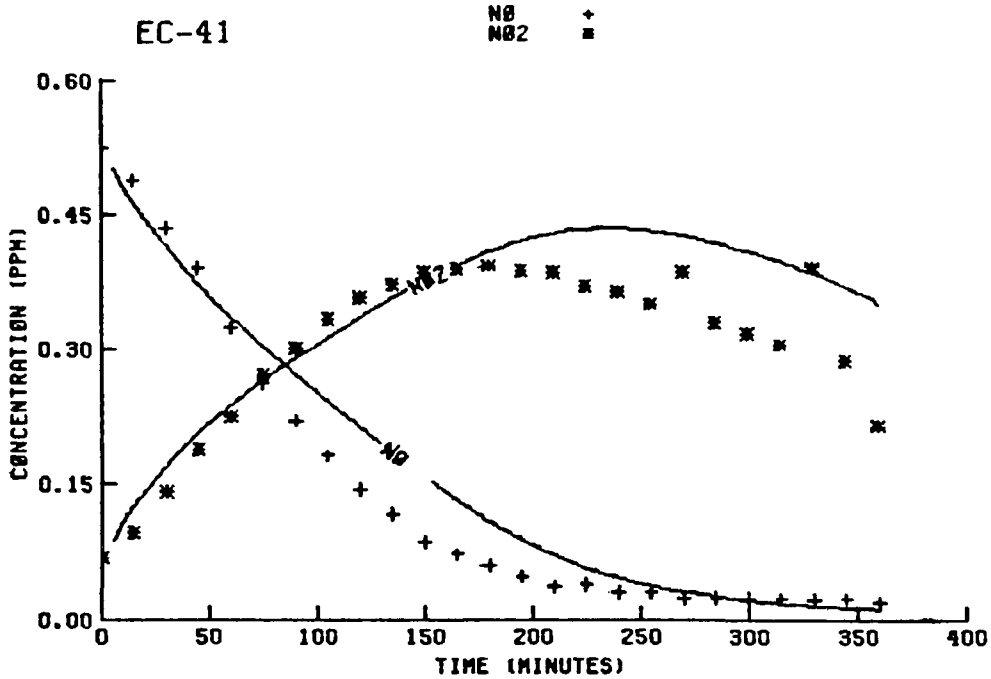

EC-39
PAN
0.012
0.009
0.006
0.003
0.000
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

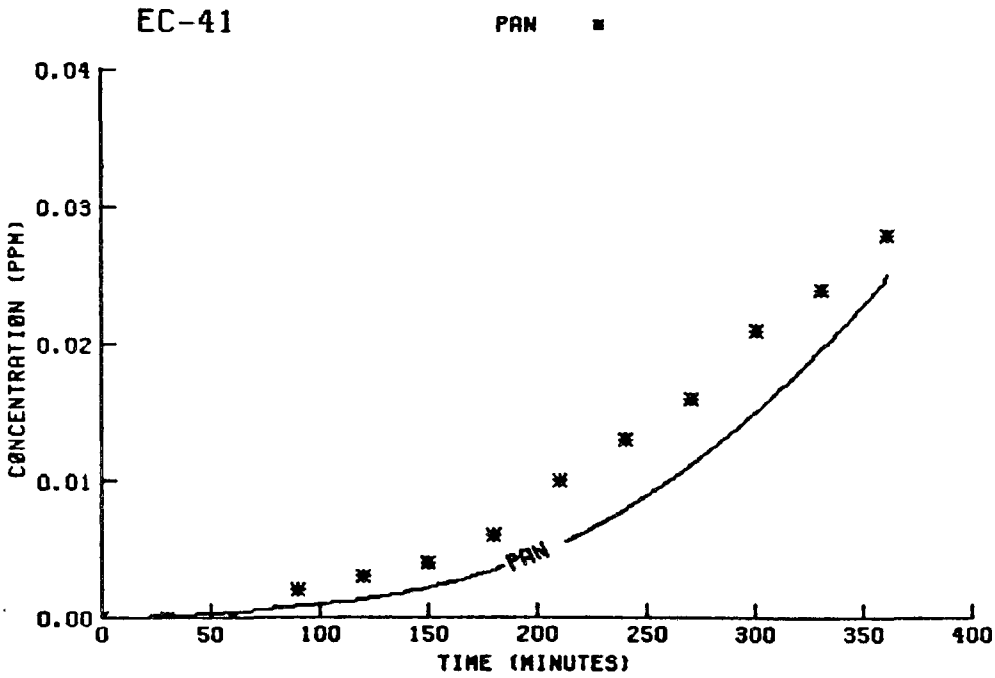

EC-39
BUT
2.40
2.20
2.00
1.60
1.60
CONCENTRATION (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

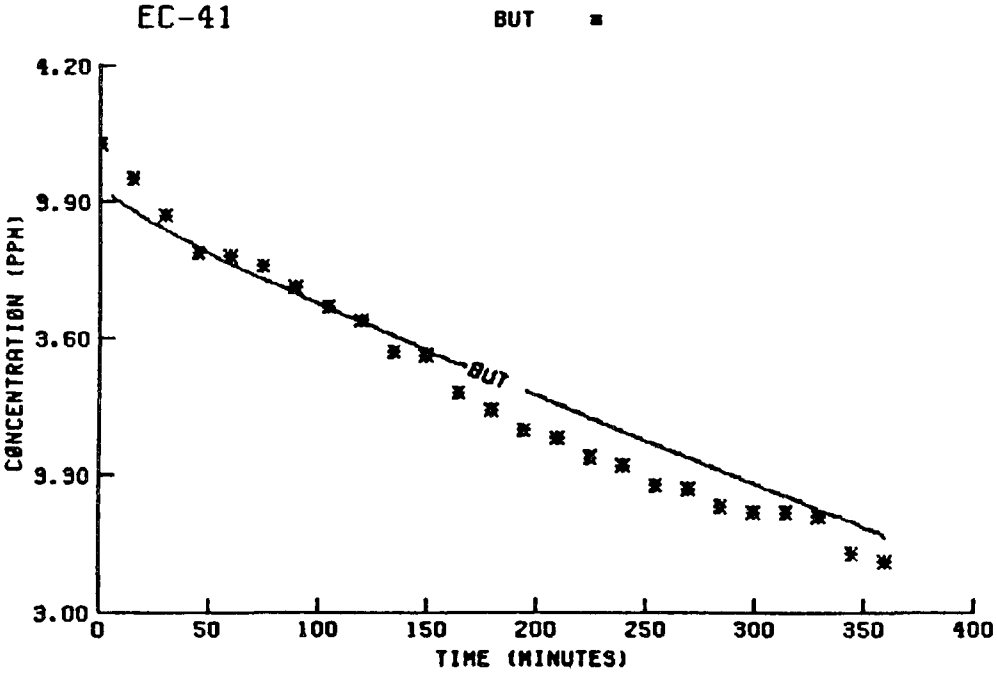

EC-39
MEK
FORM
0.08
0.06
0.04
0.02
0.00
CONCENTRATION (PPM)
MEK
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

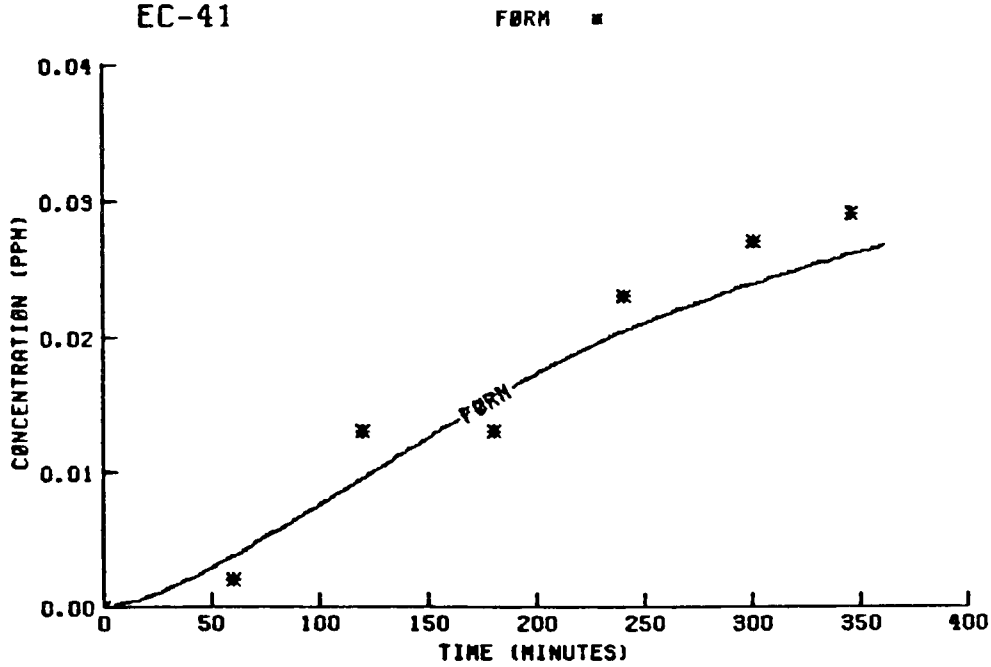

EC-39
ALD2
0.08
0.06
0.04
0.02
0.00
CONCENTRATION (PPM)
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

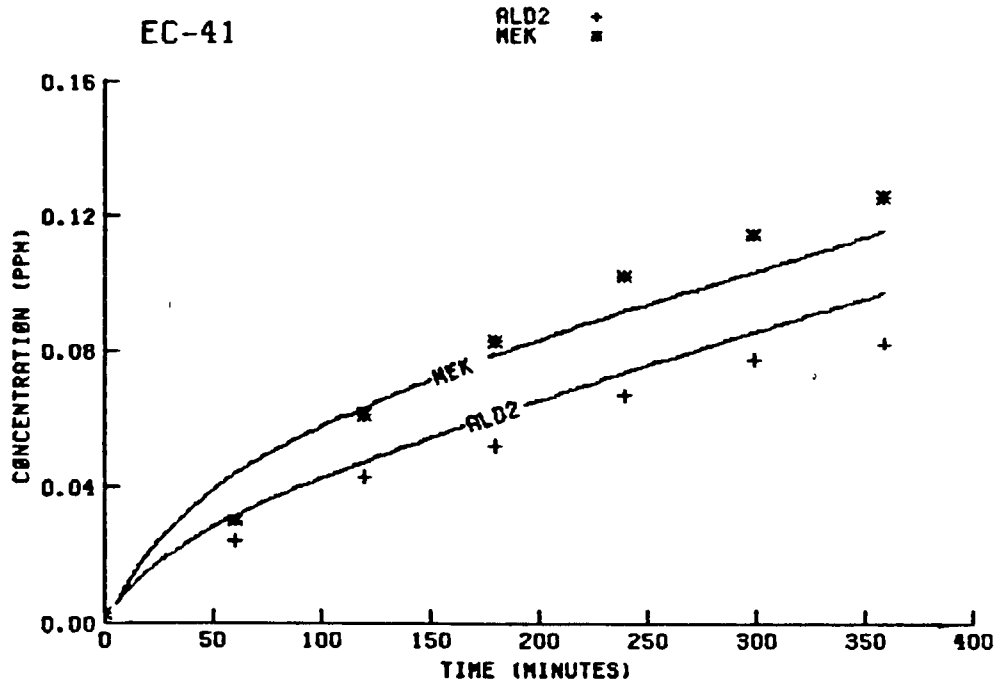

EC-41
03
0.36
0.27
0.18
0.09
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
03

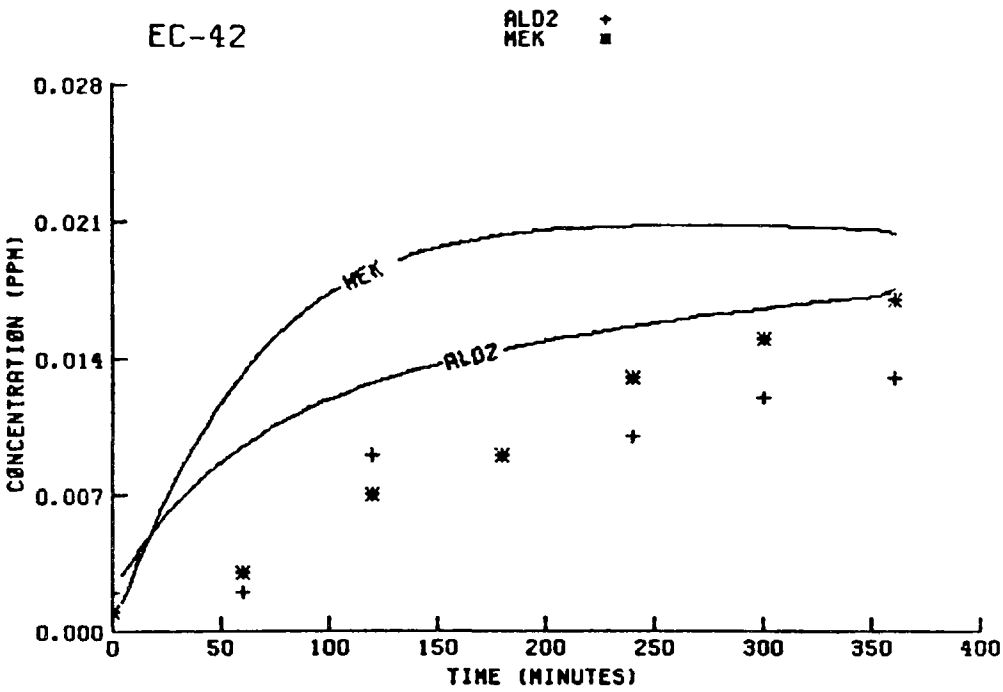

EC-41
NO
NO2
0.60
0.45
0.30
0.15
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
NO2
NO

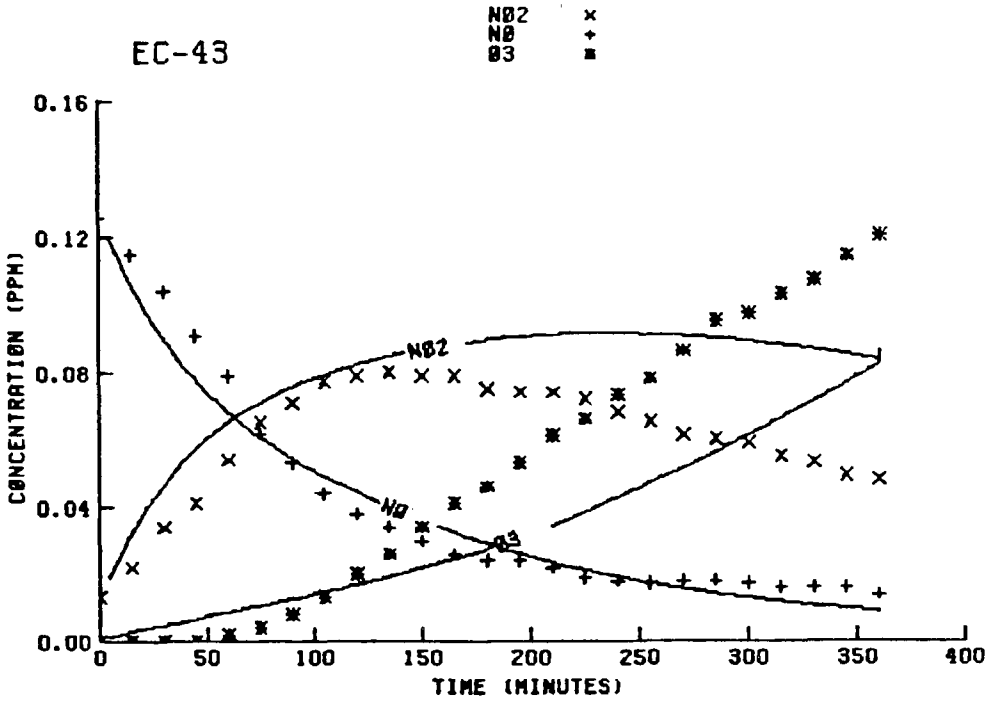

EC-41
PAN
0.04
0.03
0.02
0.01
0.00
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

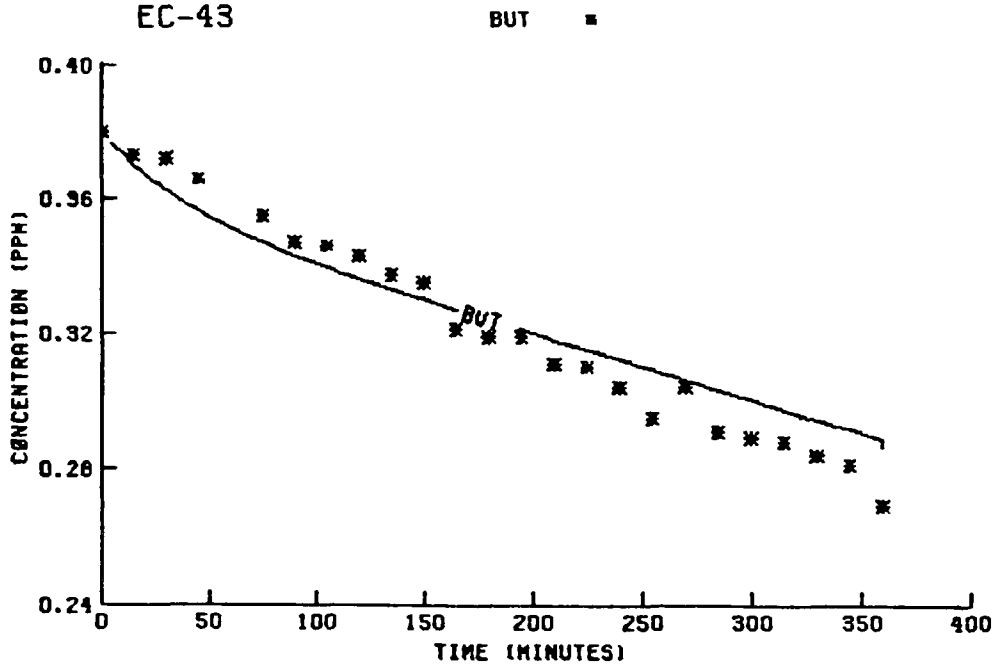

EC-41
BUT
4.20
9.90
3.60
9.90
3.00
CONCENTRATION (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

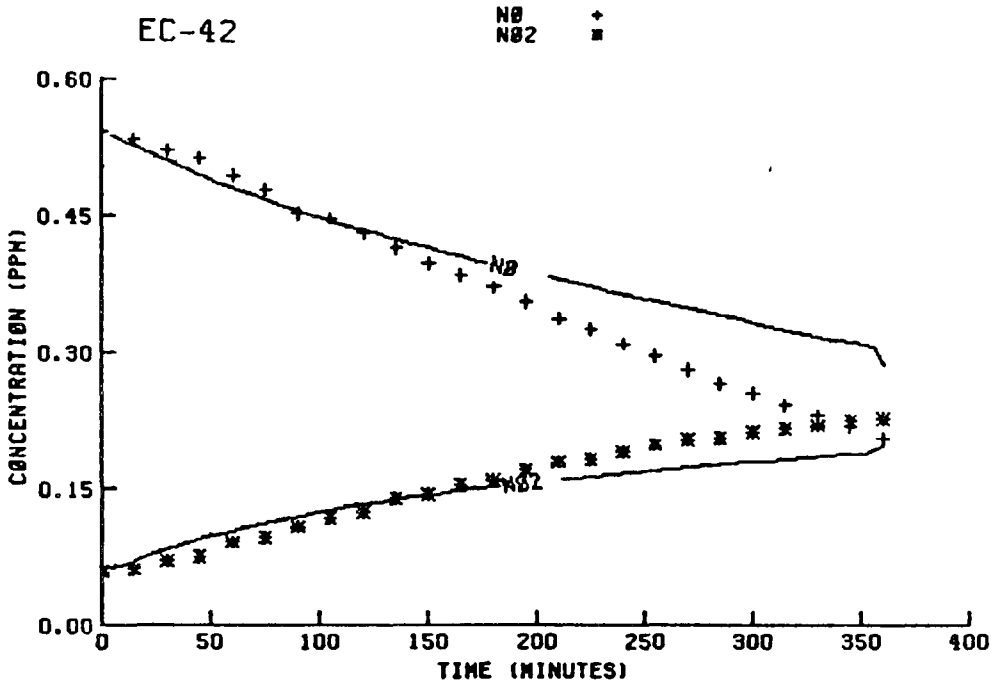

EC-41
FORM
0.04
0.03
0.02
0.01
0.00
CONCENTRATION (PPM)
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

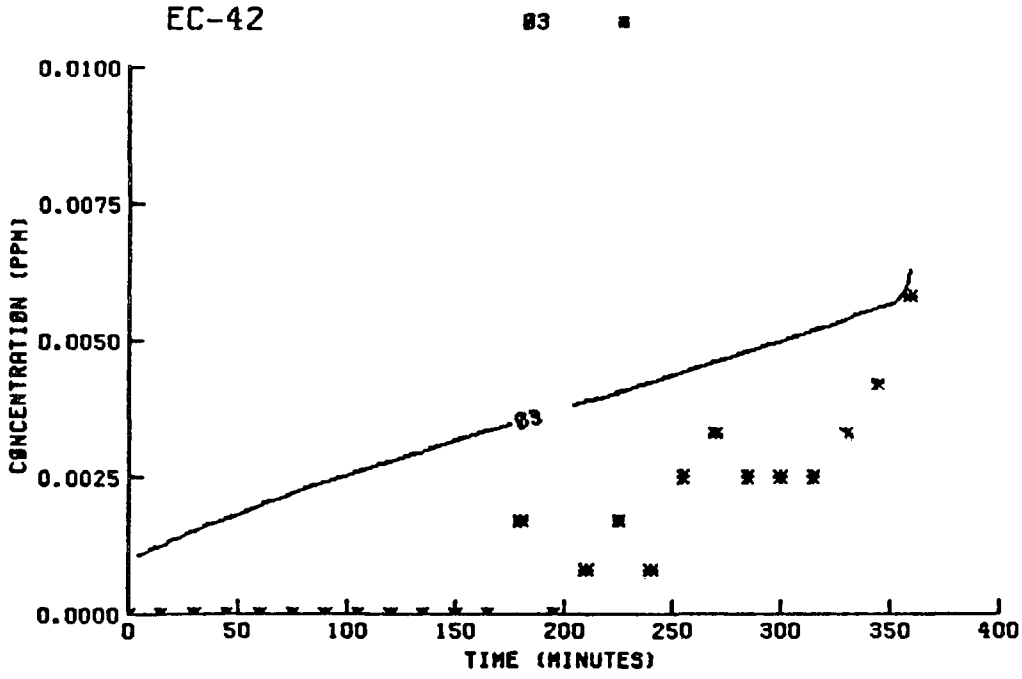

EC-41
ALD2
MEK
0.16
0.12
0.08
0.04
0.00
CONCENTRATION (PPM)
MEK
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

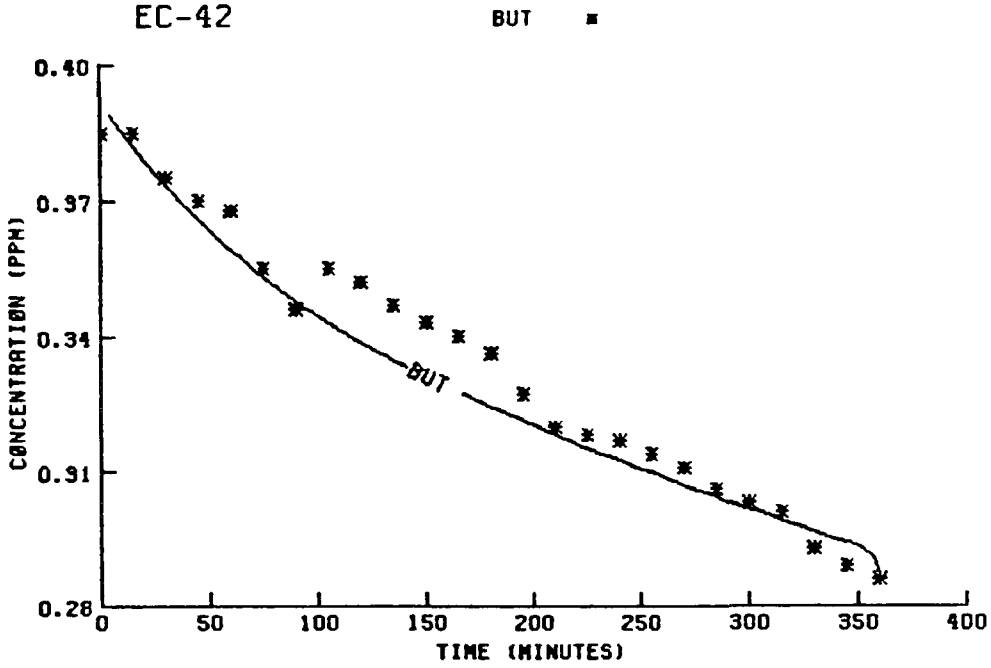

EC-42
ALD2 +
MEK ■
0.028
0.021
0.014
0.007
0.000
CONCENTRATION (PPM)
MEK
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

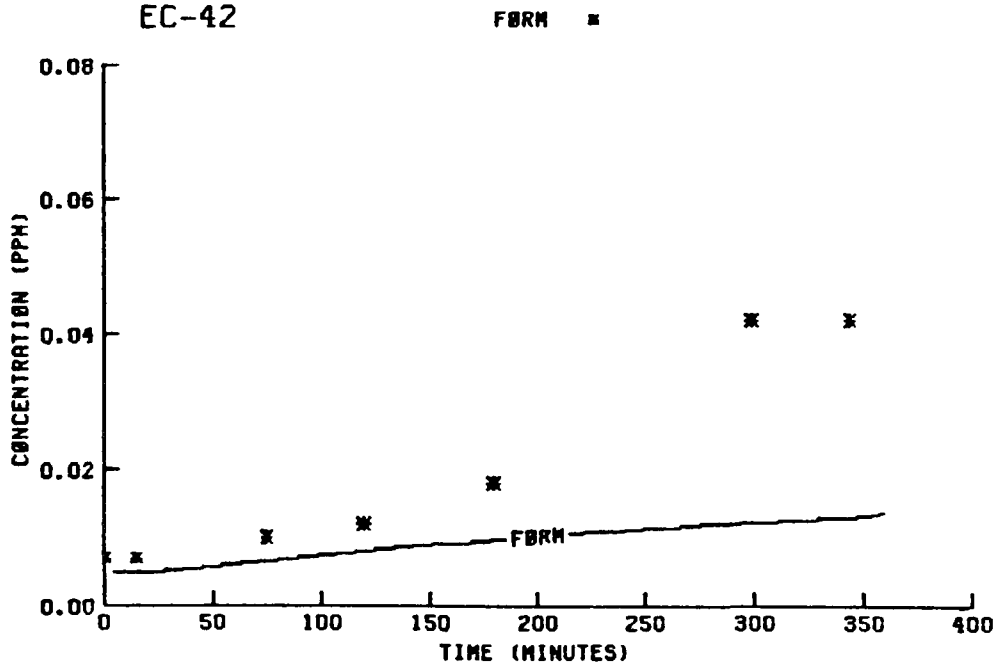

EC-43
NØ2 ×
NØ +
Ø3 ■
0.16
0.12
0.08
0.04
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

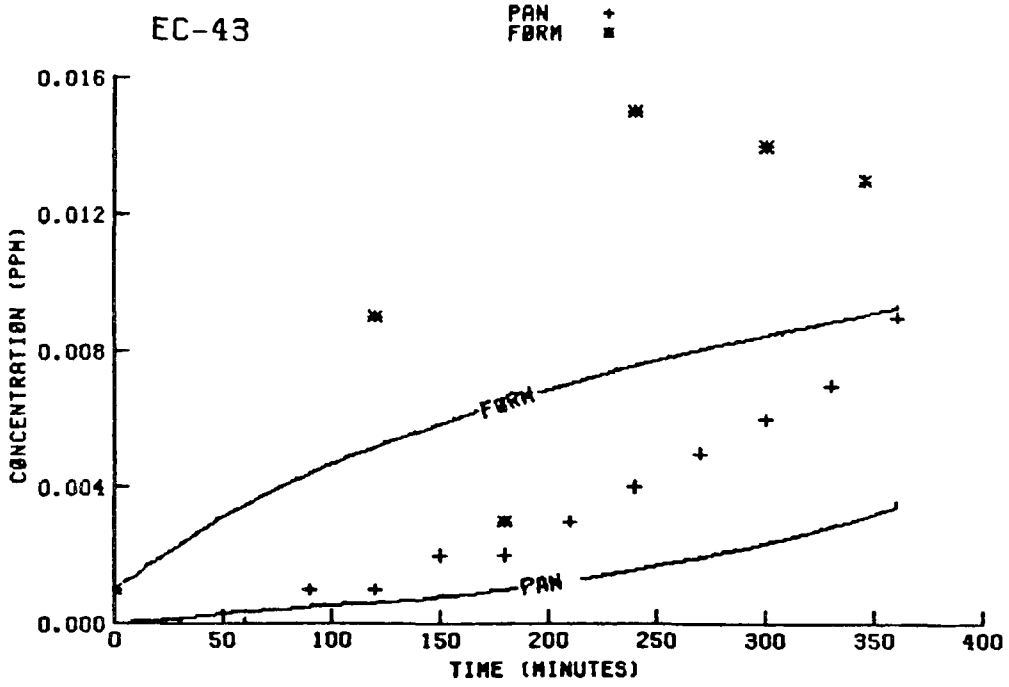

EC-43
BUT ■
0.40
0.96
0.32
0.20
0.24
CØNCENTRATIØN (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

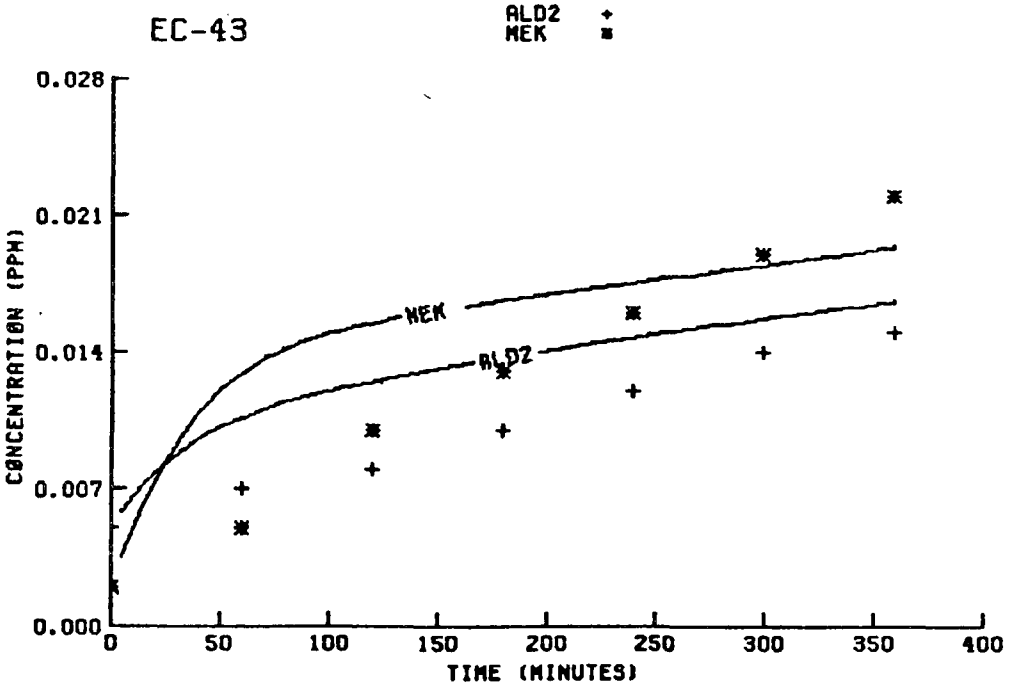

EC-42
NØ +
NØ2 ■
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
NØ
NØ2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

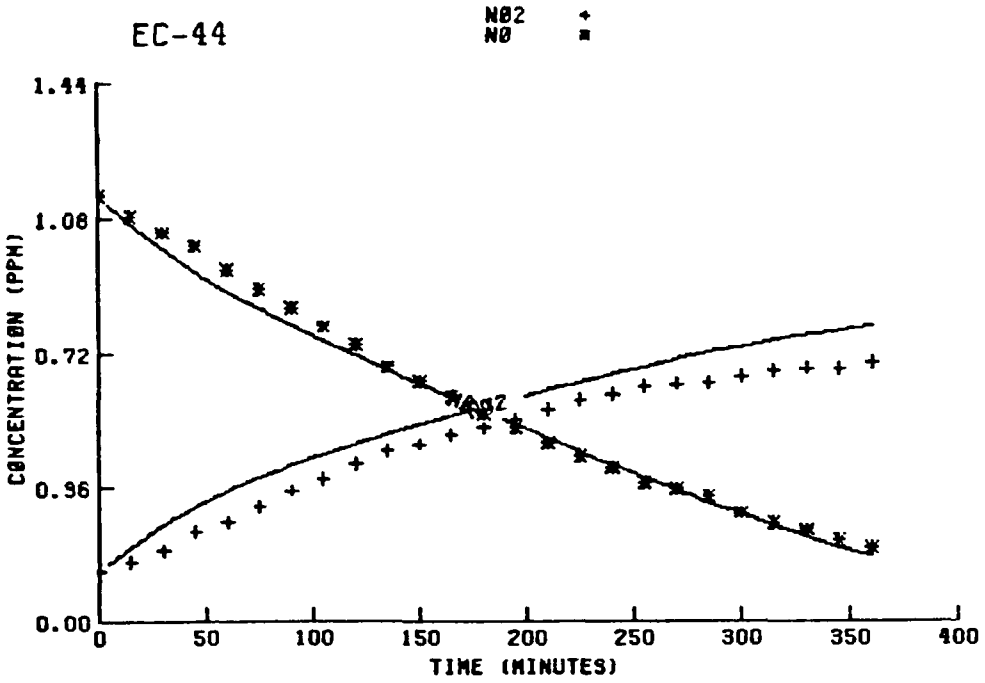

EC-42
Ø3 ■
0.0100
0.0075
0.0050
0.0025
0.0000
CØNCENTRATIØN (PPM)
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

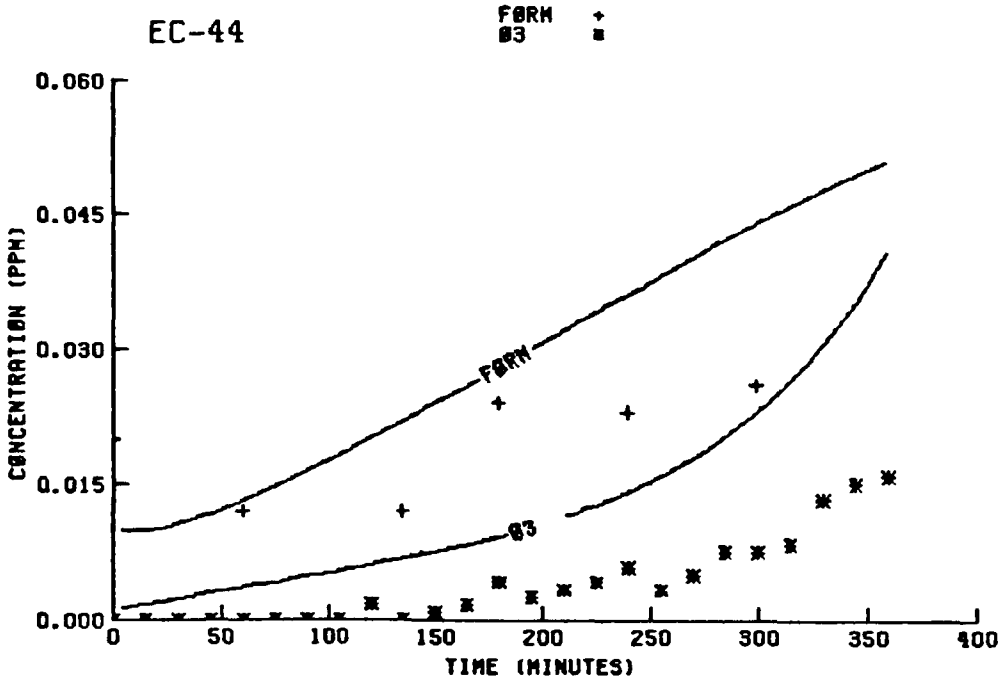

EC-42
BUT
0.40
0.37
0.34
0.31
0.28
CONCENTRATION (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

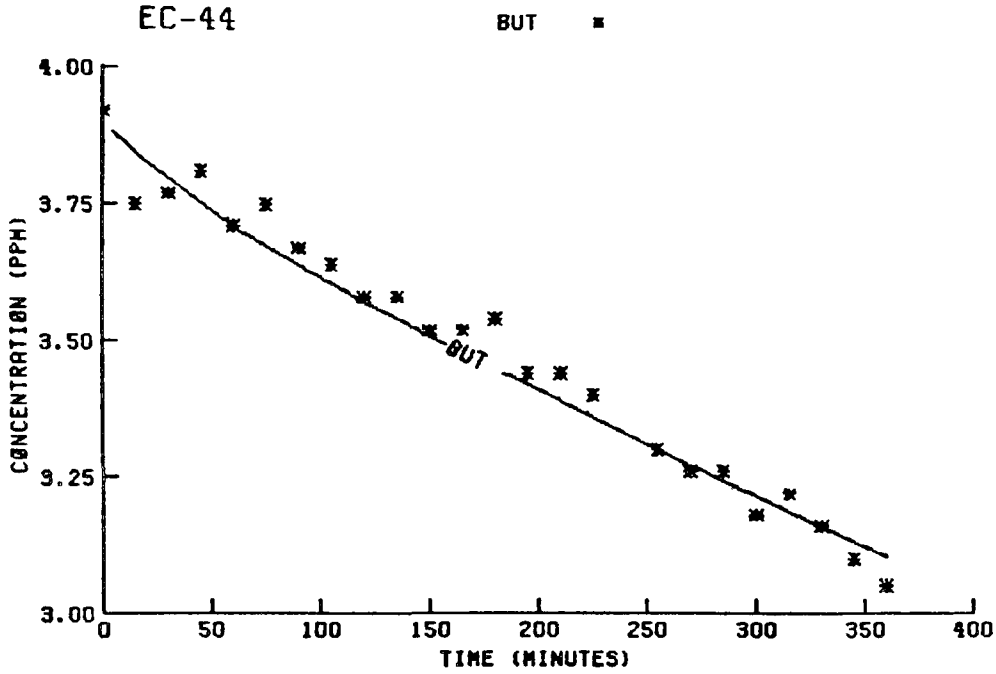

EC-42
FORM
0.08
0.06
0.04
0.02
0.00
CONCENTRATION (PPM)
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

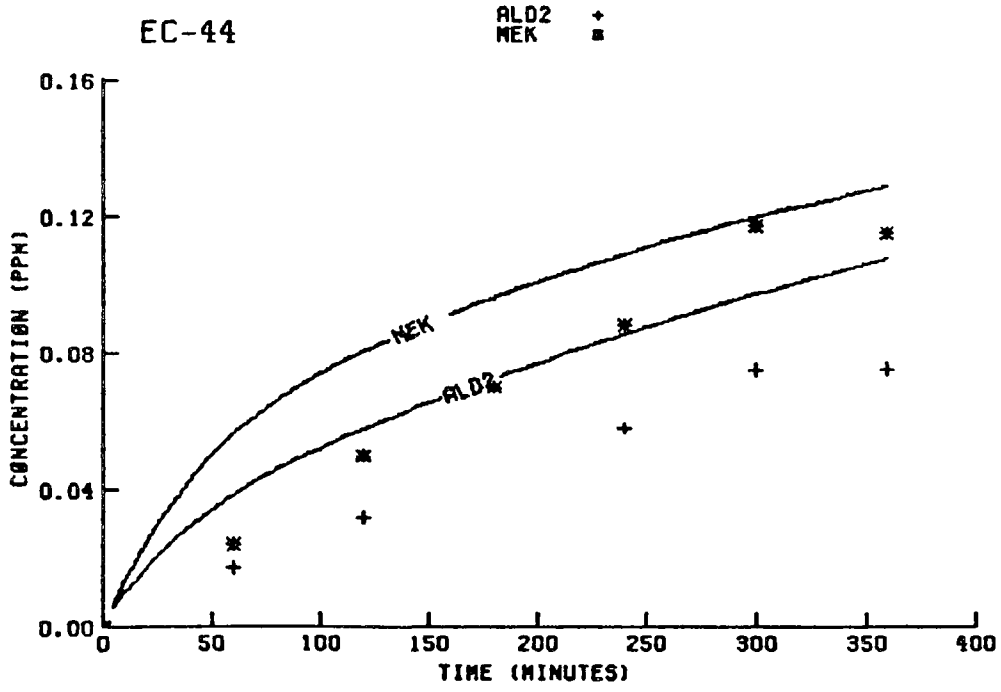

EC-43
PAN +
FORM ■
0.016
0.012
0.008
0.004
0.000
CONCENTRATION (PPM)
FORM
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

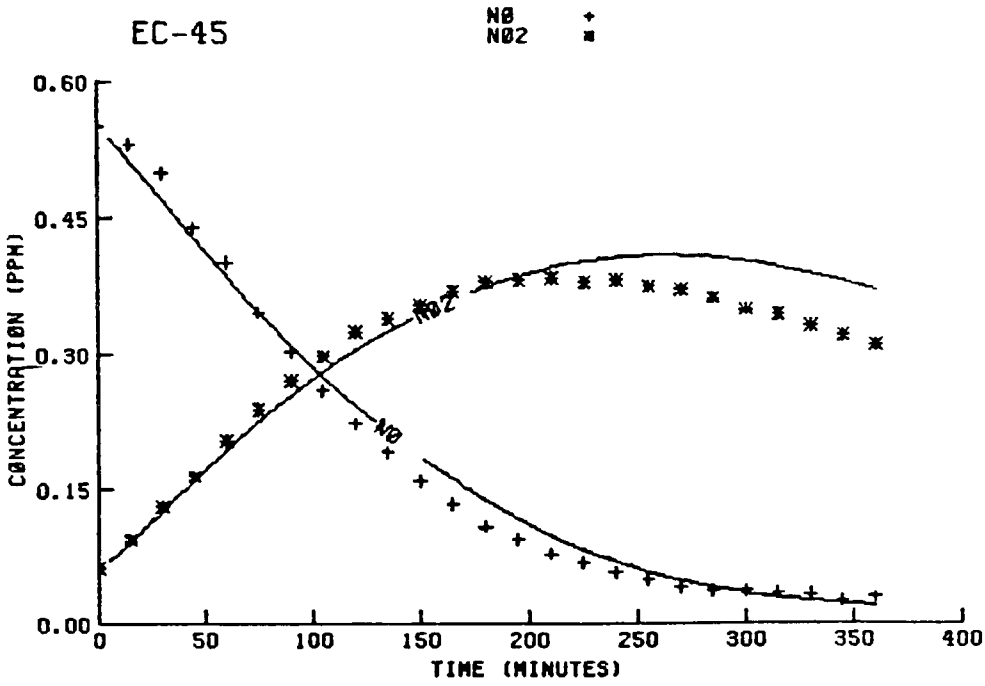

EC-43
ALD2 +
MEK ■
0.028
0.021
0.014
0.007
0.000
CONCENTRATION (PPM)
MEK
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

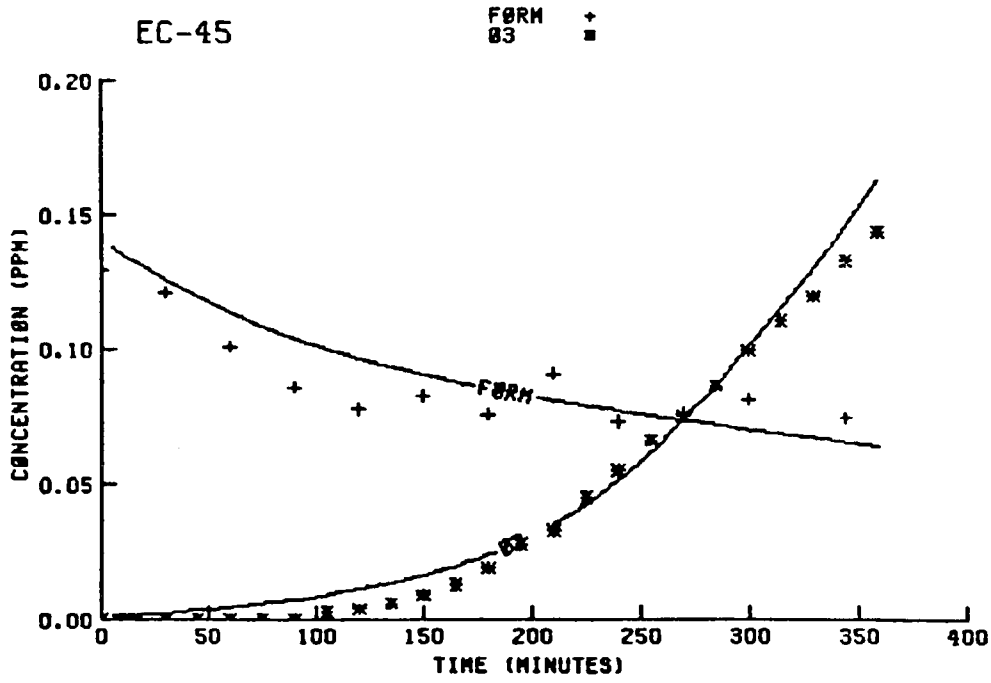

EC-44
NØ2 +
NØ ■
1.44
1.08
0.72
0.36
0.00
CØNCENTRATIØN (PPM)
NØ2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

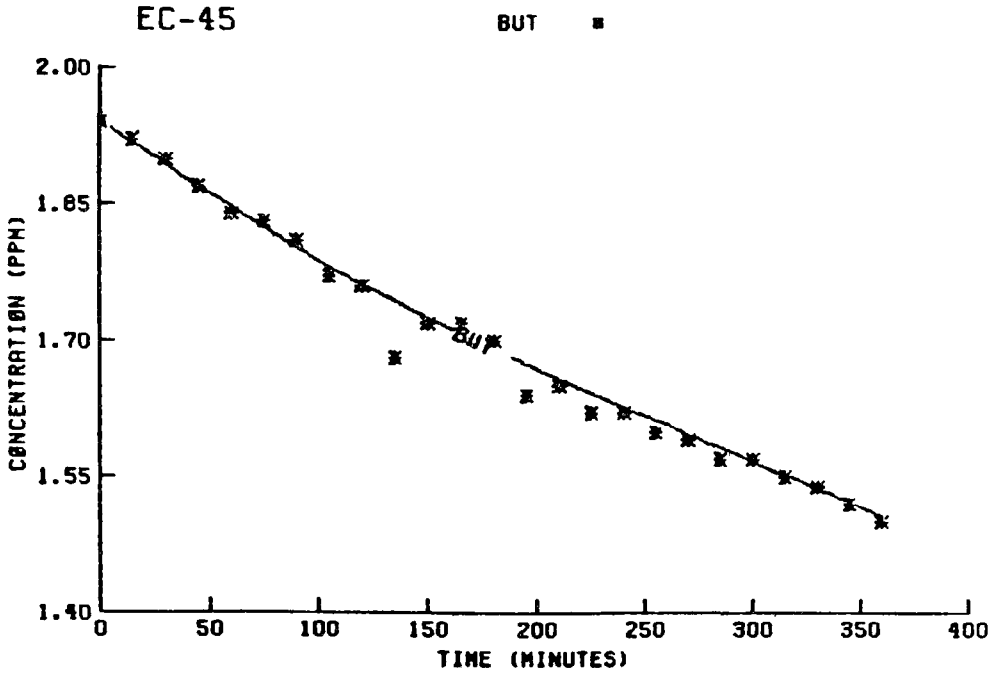

EC-44
FØRM +
Ø3 ■
0.060
0.045
0.030
0.015
0.000
CØNCENTRATIØN (PPM)
FØRM
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

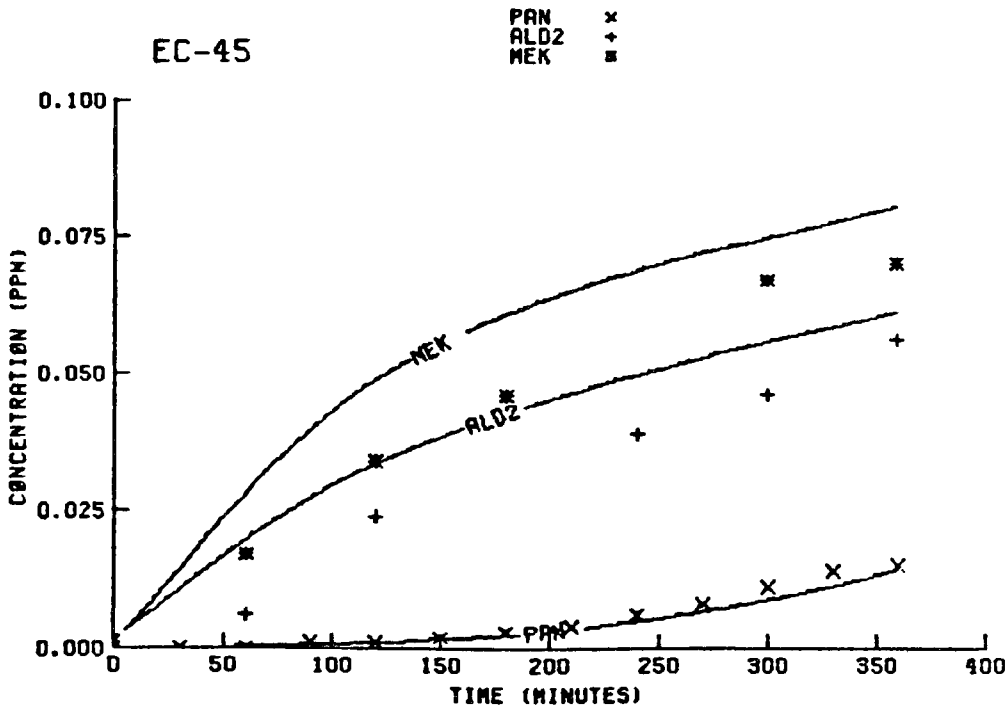

EC-44
BUT
4.00
3.75
3.50
3.25
3.00
CONCENTRATION (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

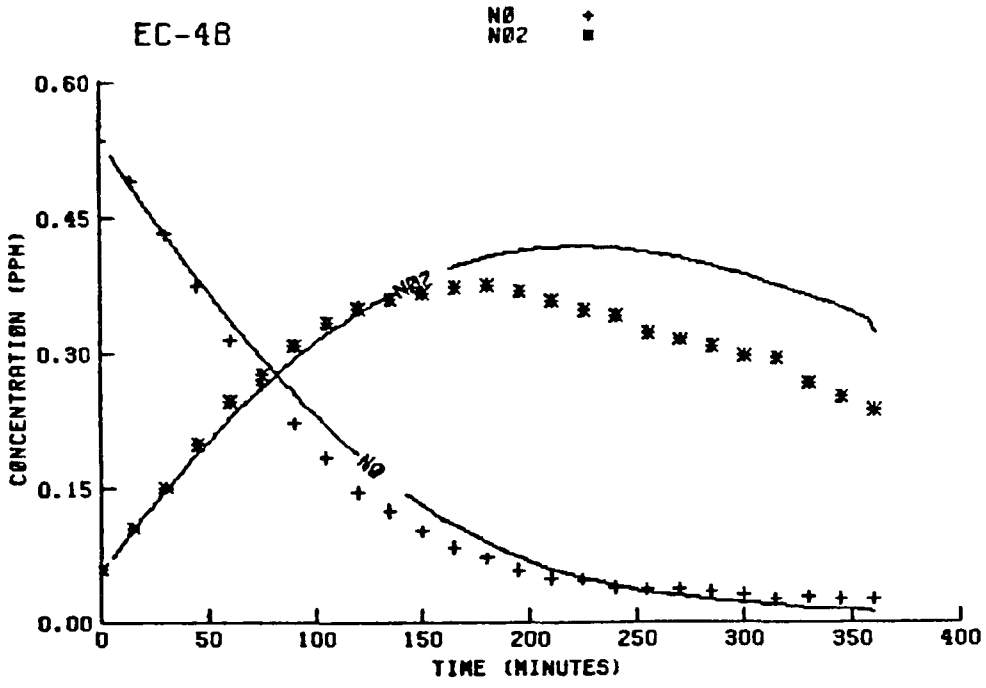

EC-44
ALD2
MEK
0.16
0.12
0.08
0.04
0.00
CONCENTRATION (PPM)
MEK
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

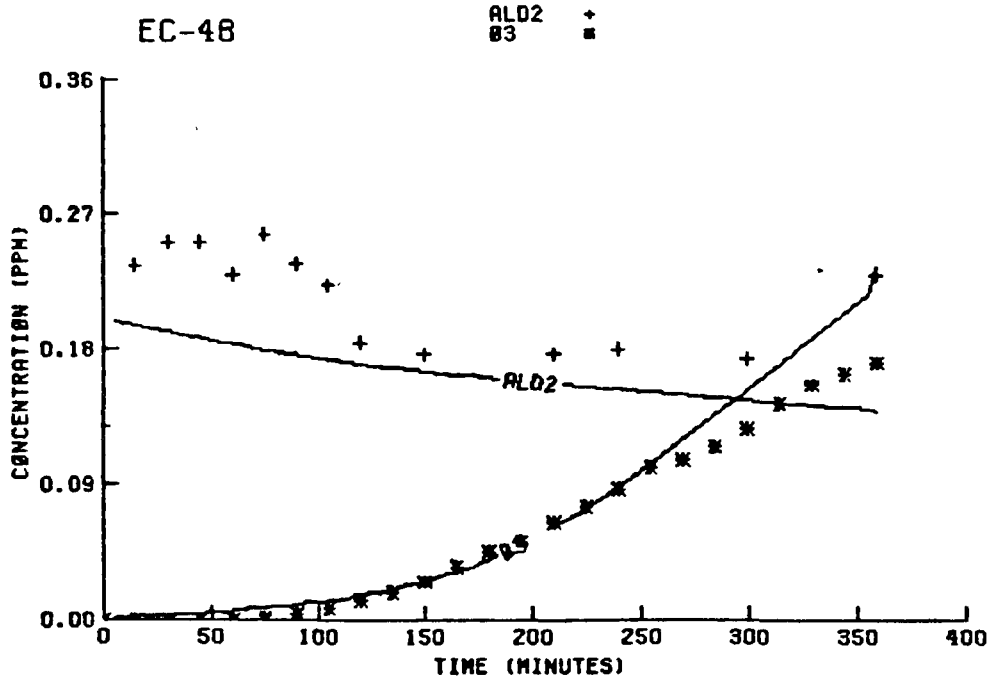

EC-45
NØ +
NØ2 ■
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

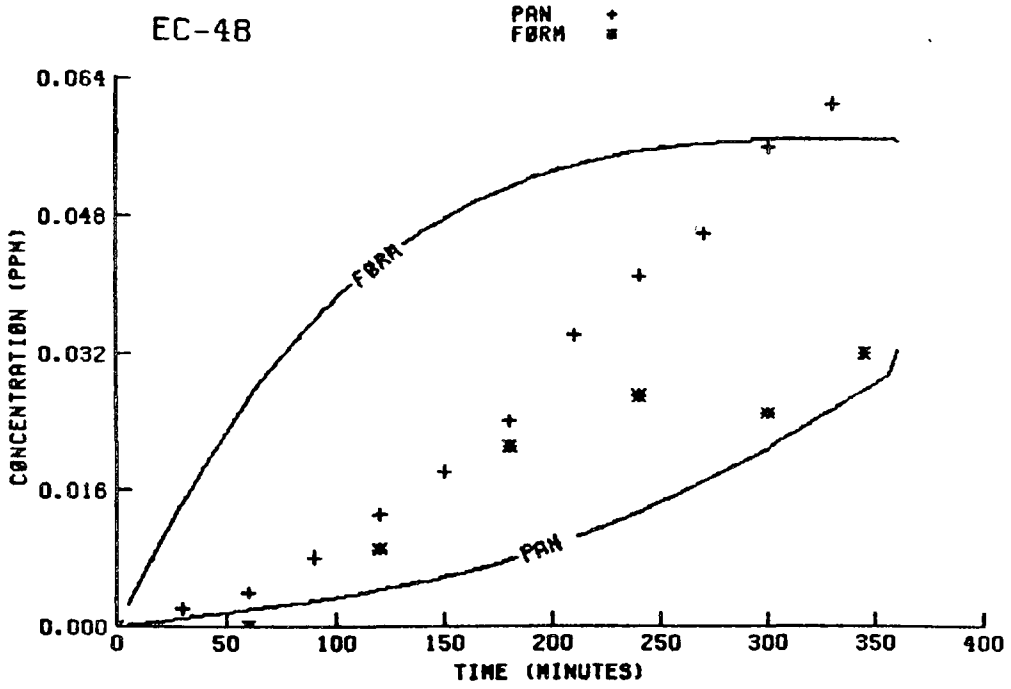

EC-45
FØRM +
Ø3 ■
0.20
0.15
0.10
0.05
0.00
CØNCENTRATIØN (PPM)
FØRM
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

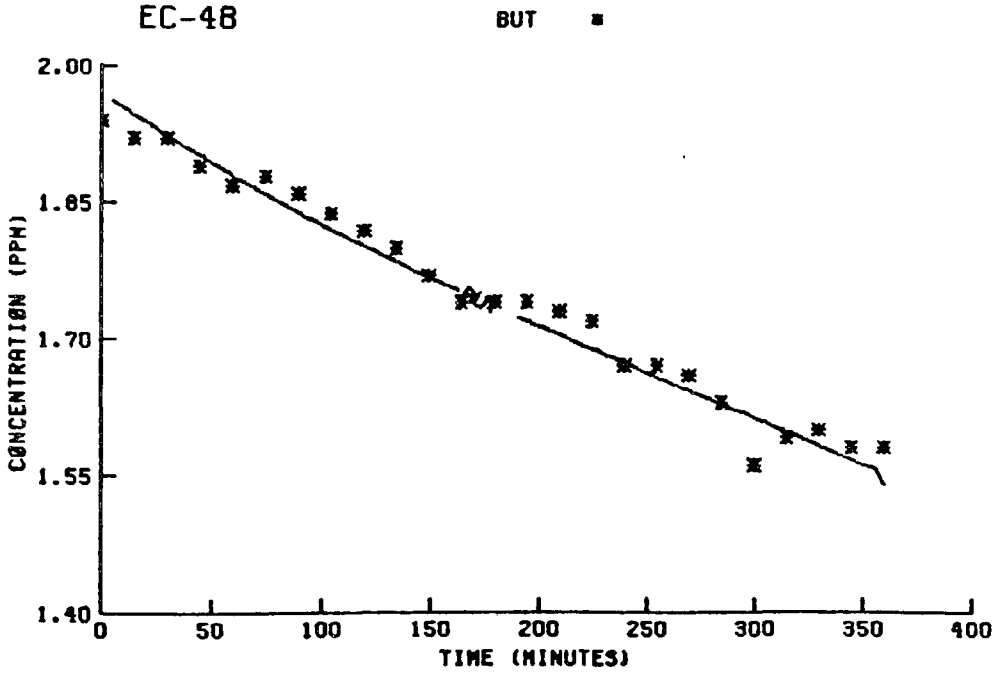

EC-45
BUT
2.00
1.85
1.70
1.55
1.40
CONCENTRATION (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

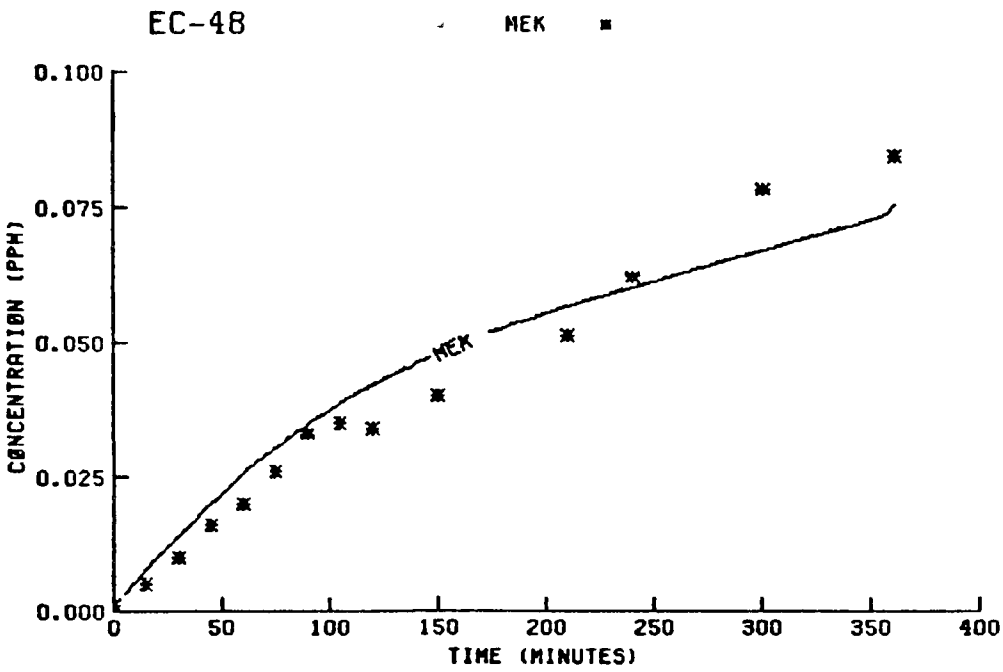

PAN
ALD2
MEK
EC-45
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
MEK
ALD2
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

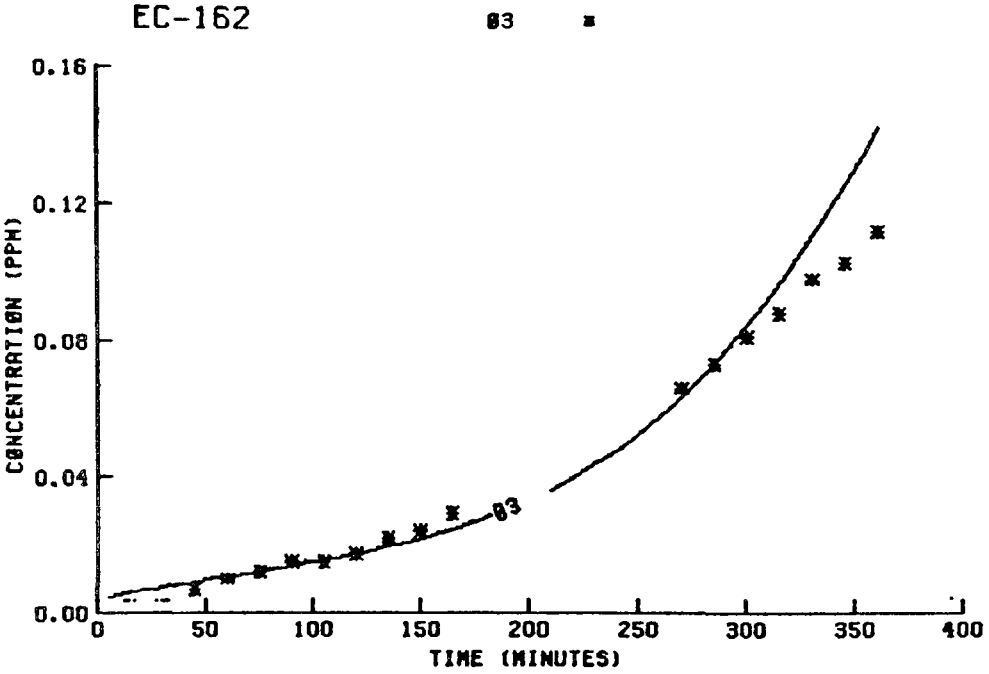

EC-48
NØ
NØ2
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

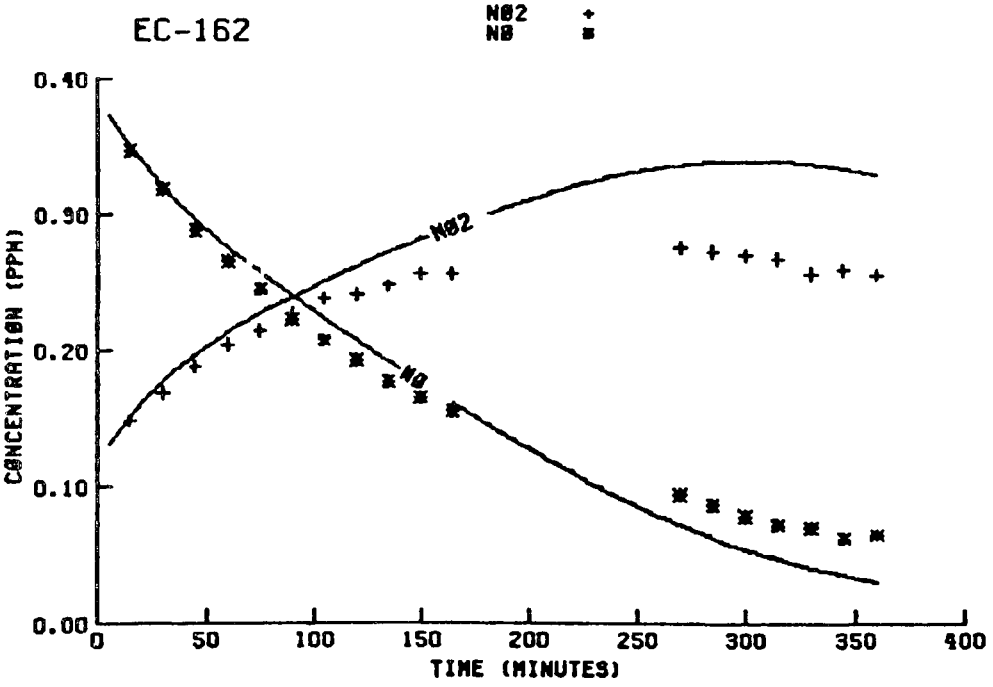

EC-48
ALD2
Ø3
0.36
0.27
0.18
0.09
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

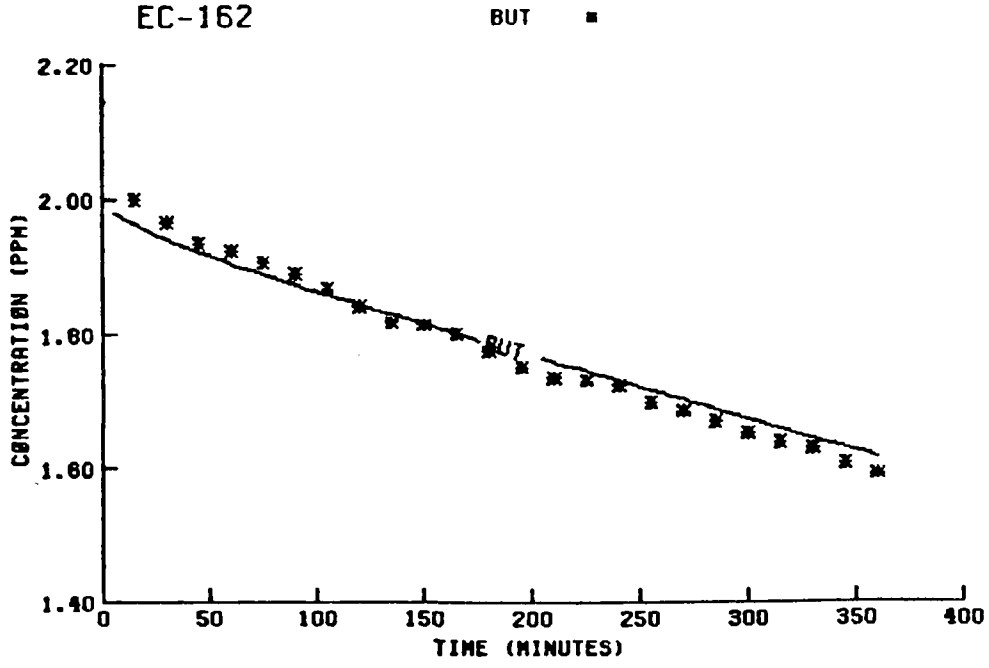

EC-48
PAN +
FORM ■
0.064
0.048
0.032
0.016
0.000
CONCENTRATION (PPM)
FORM
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

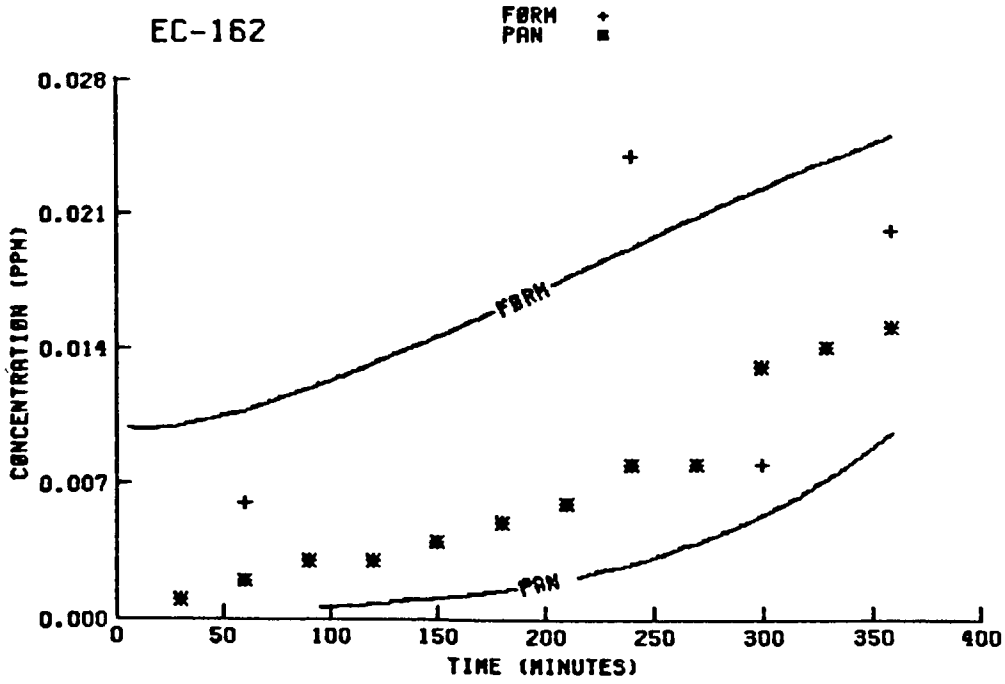

EC-48
BUT ■
2.00
1.85
1.70
1.55
1.40
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

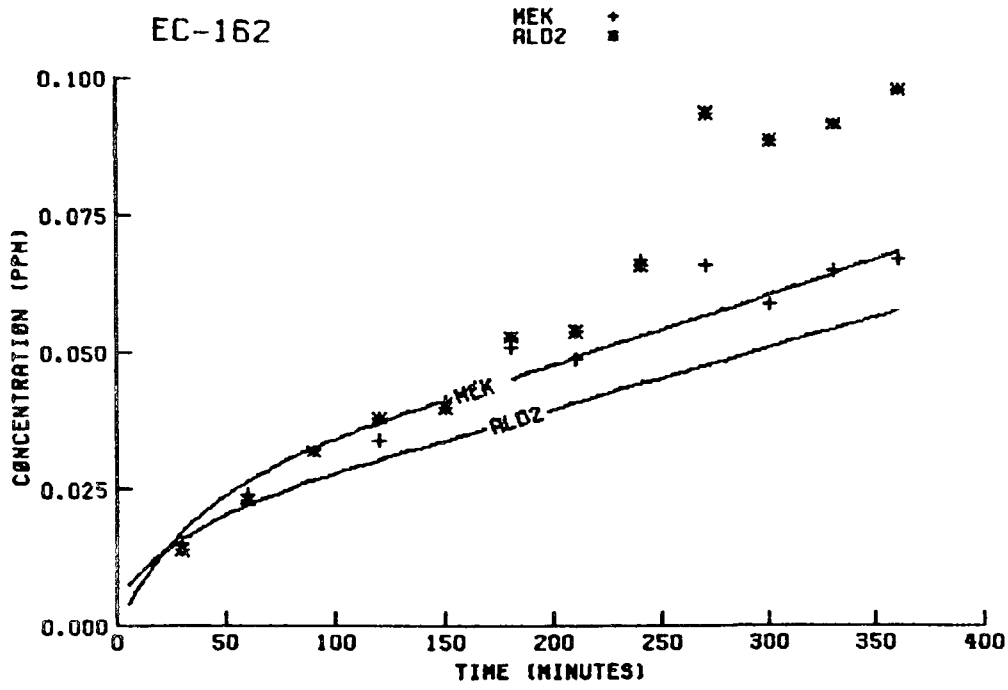

EC-48
MEK
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
MEK
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

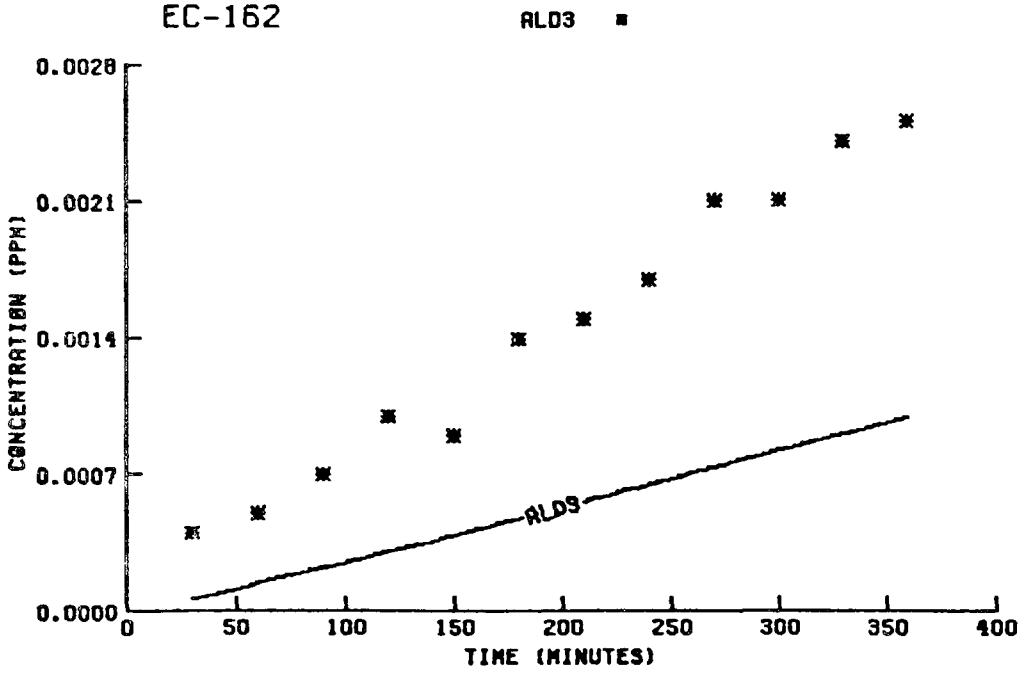

EC-162
O3 *
0.16
0.12
0.08
0.04
0.00
CONCENTRATION (PPM)
O3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

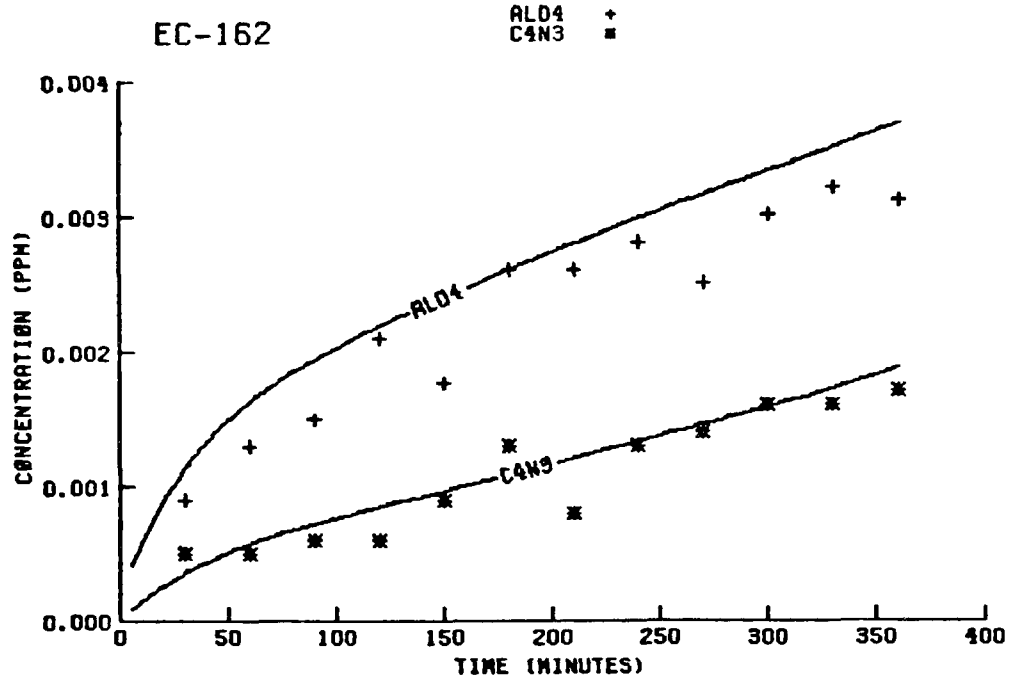

EC-162
NO2 +
NO *
0.40
0.30
0.20
0.10
0.00
CONCENTRATION (PPM)
NO2
NO
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

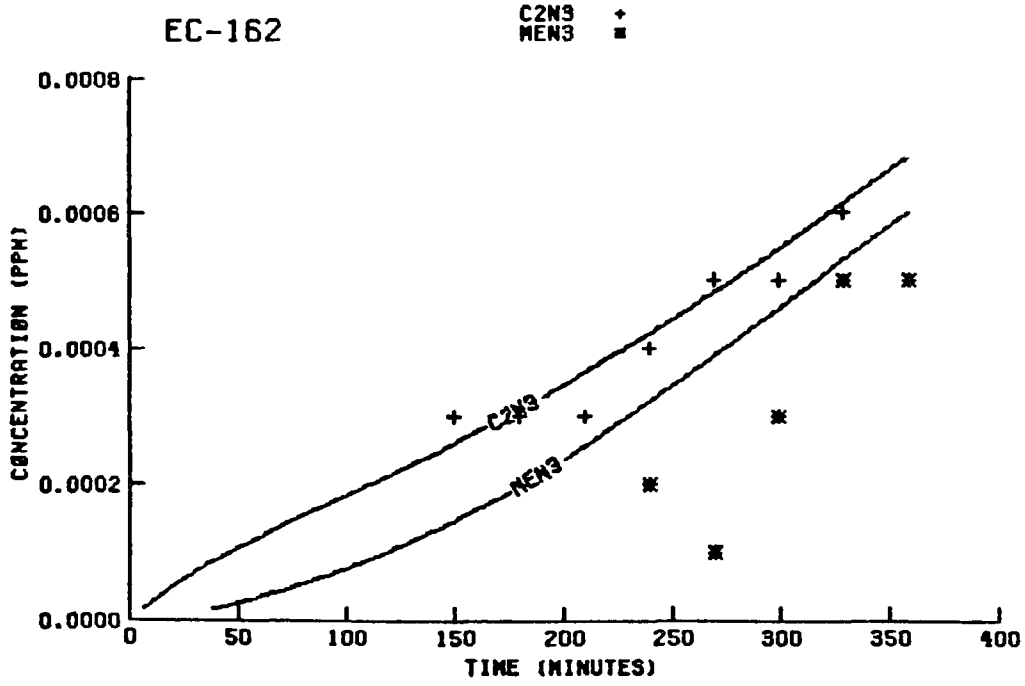

EC-162
BUT
2.20
2.00
1.80
1.60
1.40
CONCENTRATION (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

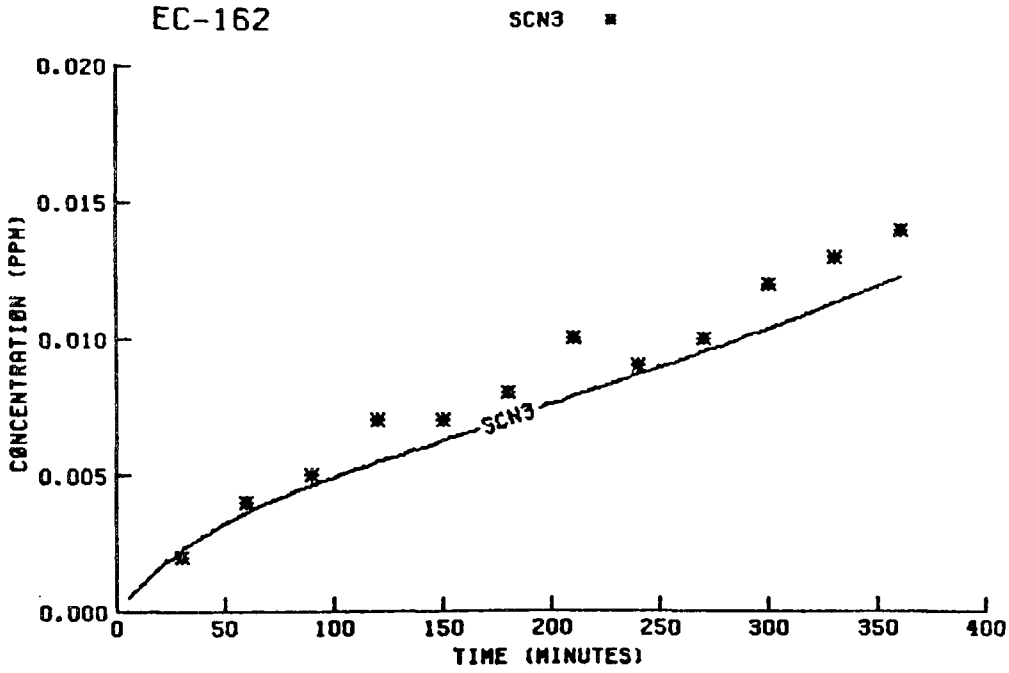

EC-162
FORM
PAN
0.028
0.021
0.014
0.007
0.000
CONCENTRATION (PPM)
FORM
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

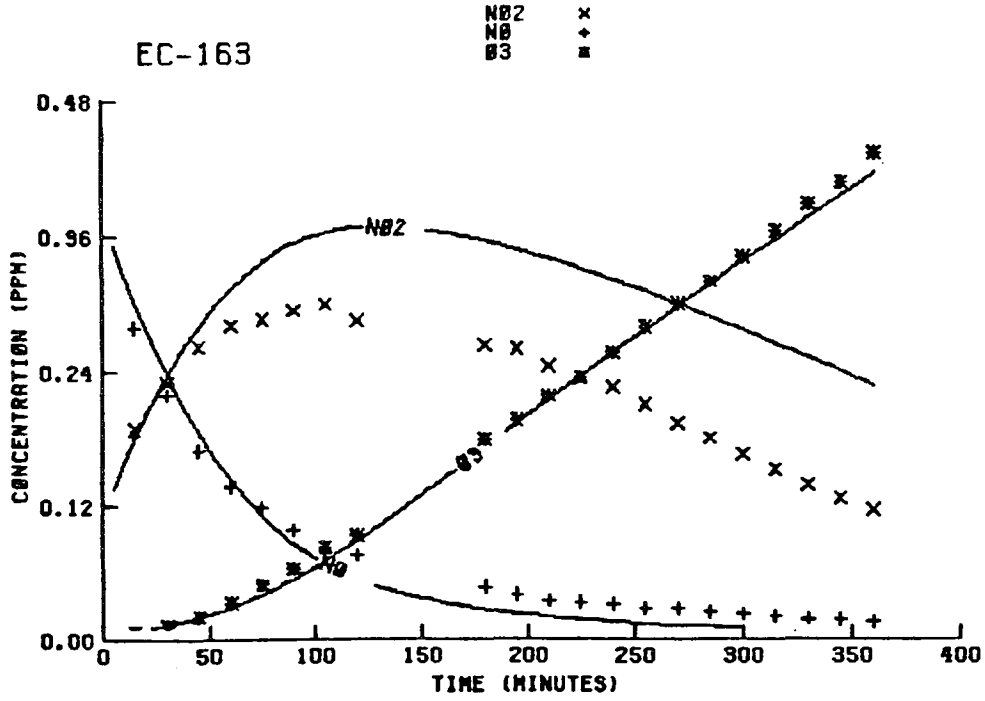

EC-162
MEK +
ALD2 ■
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
MEK
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

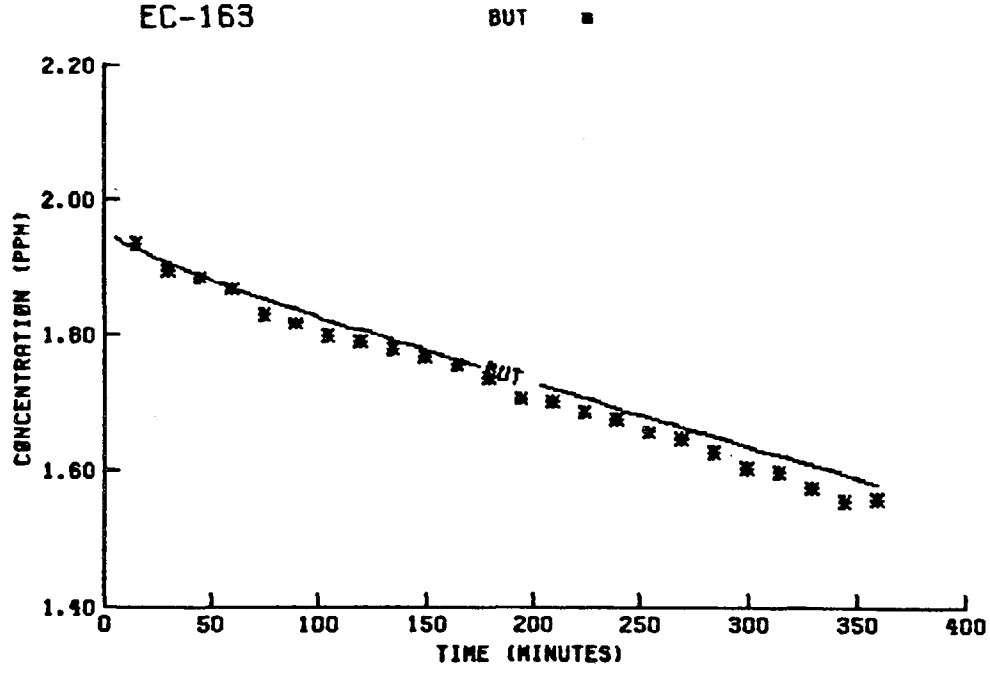

EC-162
ALD3 ■
0.0028
0.0021
0.0014
0.0007
0.0000
CONCENTRATION (PPM)
ALD3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

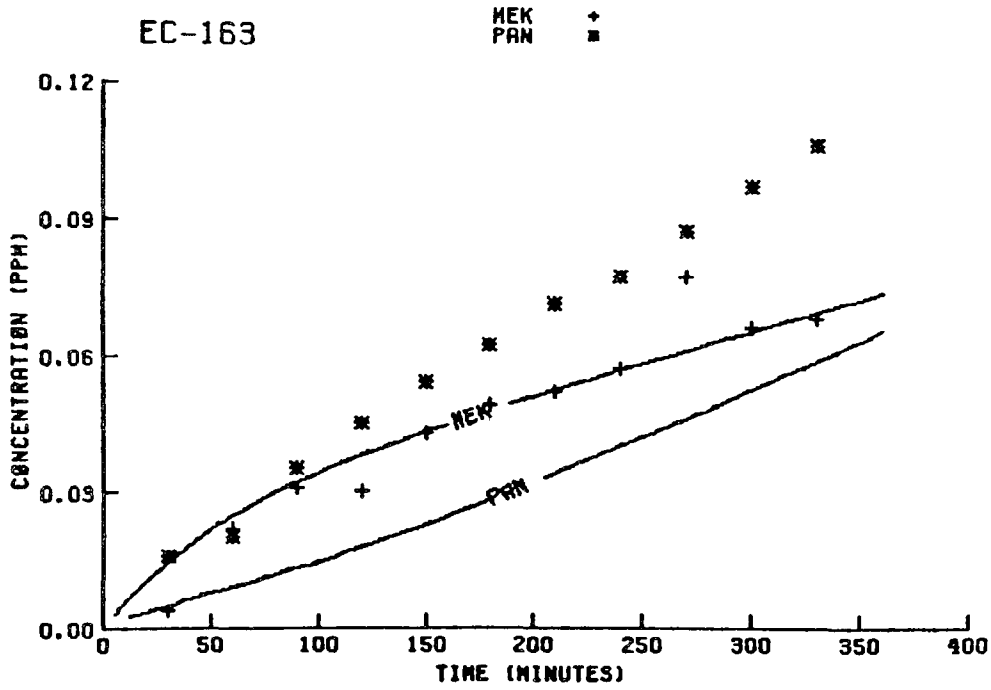

EC-162
ALD4 +
C4N3 ■
0.004
0.003
0.002
0.001
0.000
CONCENTRATION (PPM)
ALD4
C4N3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

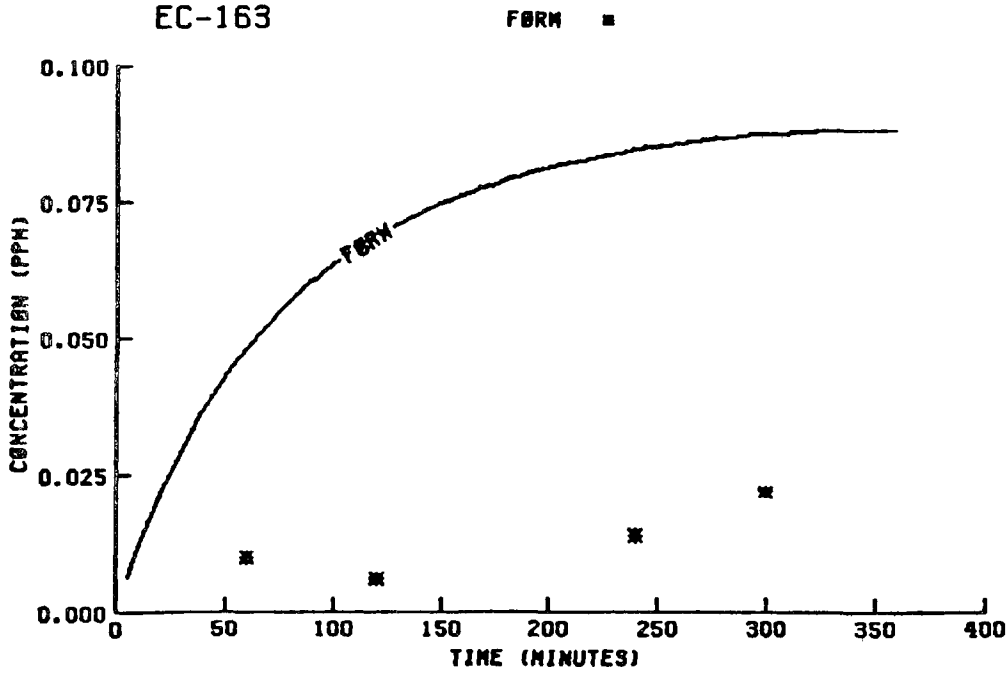

EC-162
C2N3 +
MEN3 ■
0.0008
0.0006
0.0004
0.0002
0.0000
CONCENTRATION (PPM)
C2N3
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

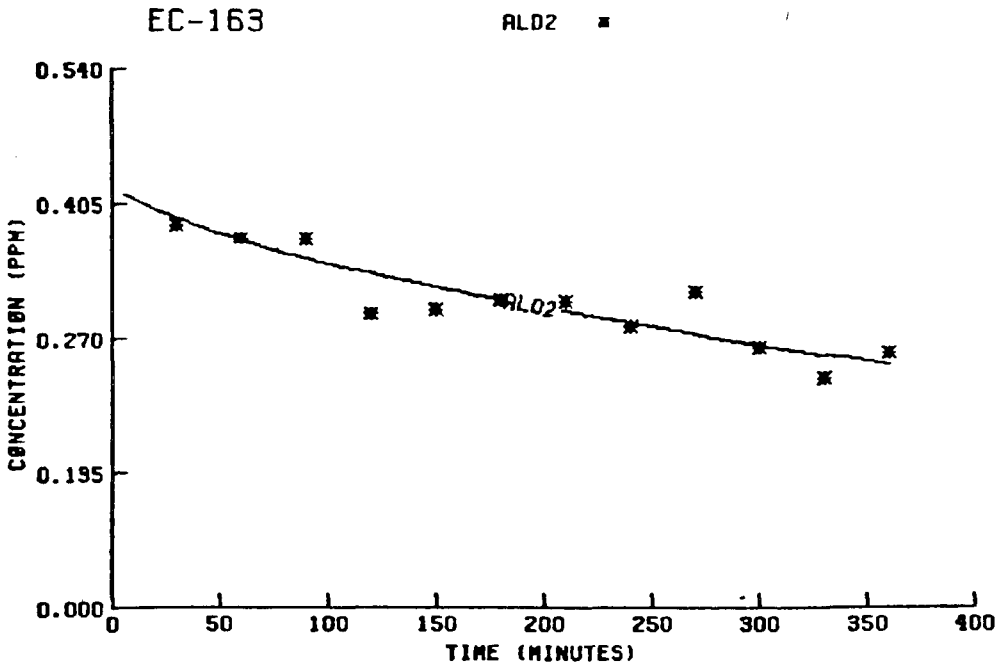

EC-162
SCN3
0.020
0.015
0.010
0.005
0.000
CONCENTRATION (PPM)
SCN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

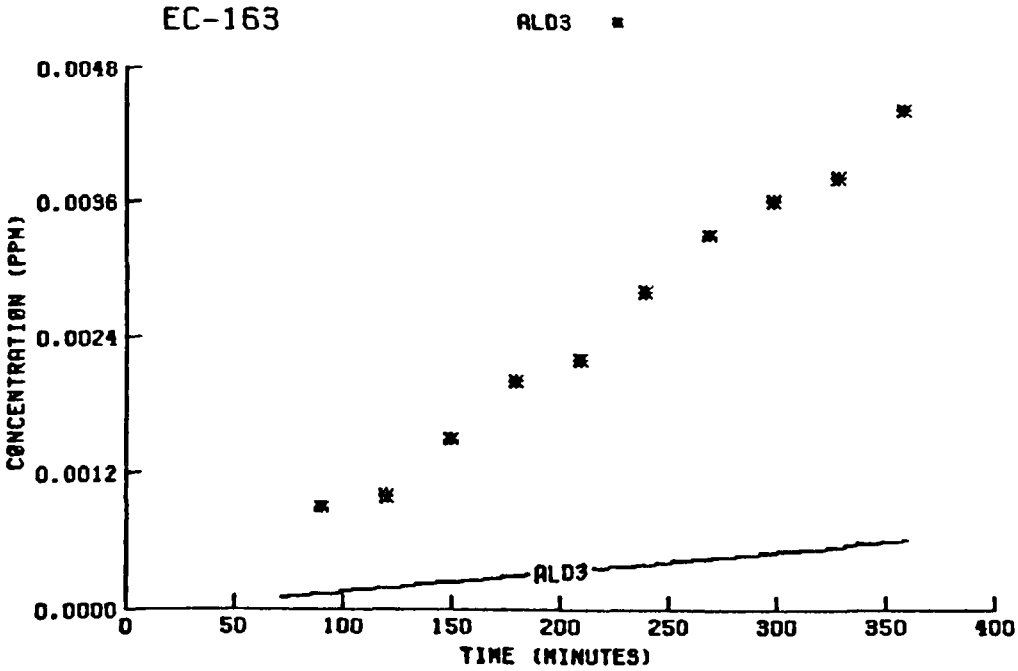

EC-163
NØ2
NØ
Ø3
0.48
0.96
0.24
0.12
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

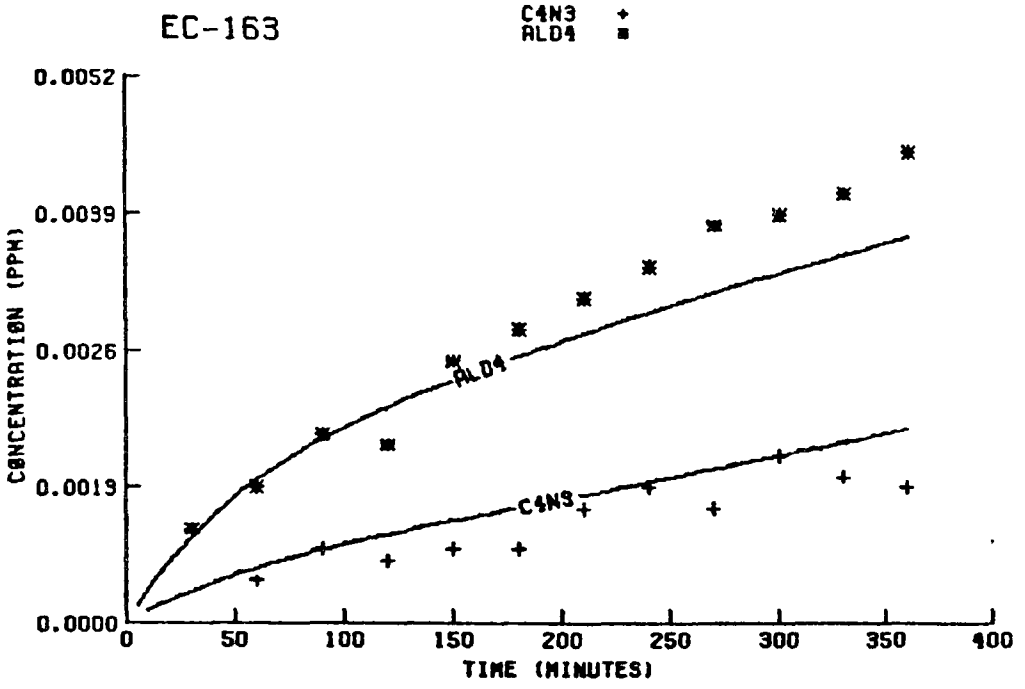

EC-163
BUT
2.20
2.00
1.80
1.60
1.40
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

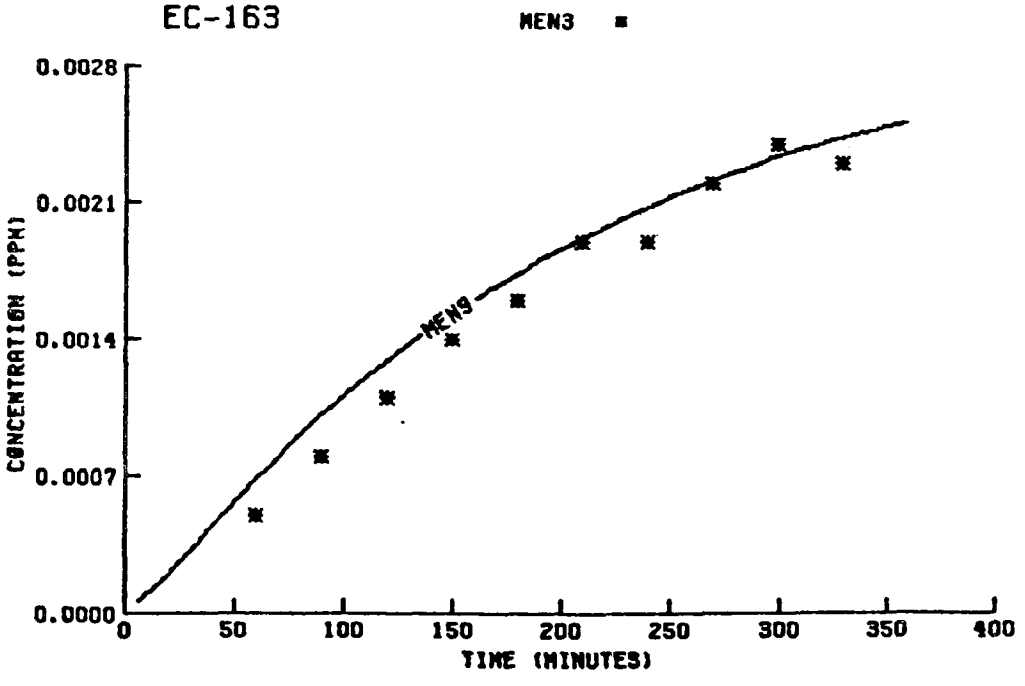

EC-163
MEK +
PAN ■
0.12
0.09
0.06
0.03
0.00
CONCENTRATION (PPM)
MEK
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

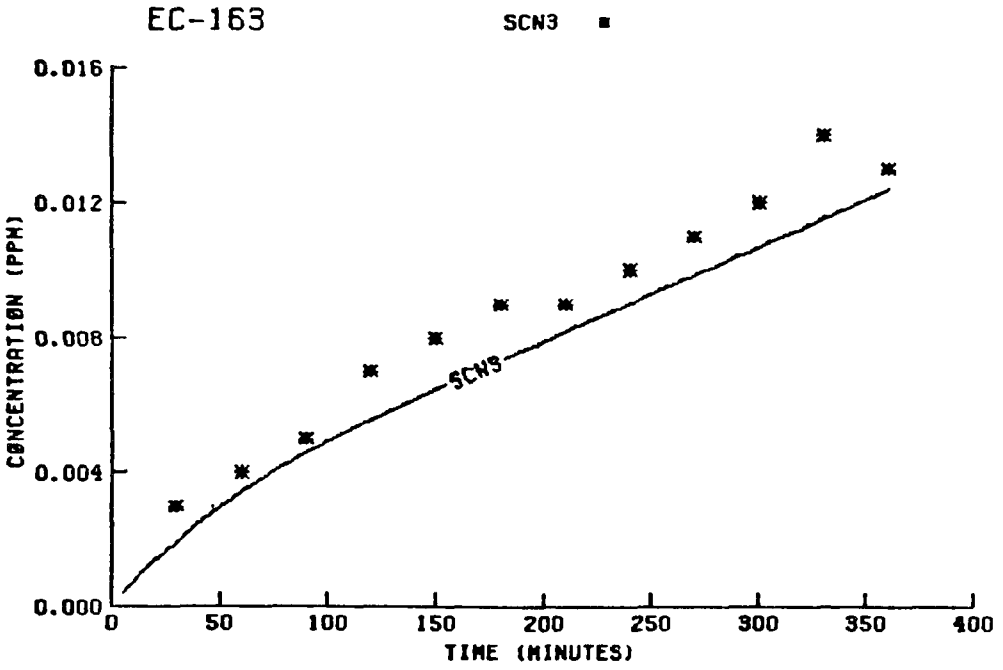

EC-163
FORM ■
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

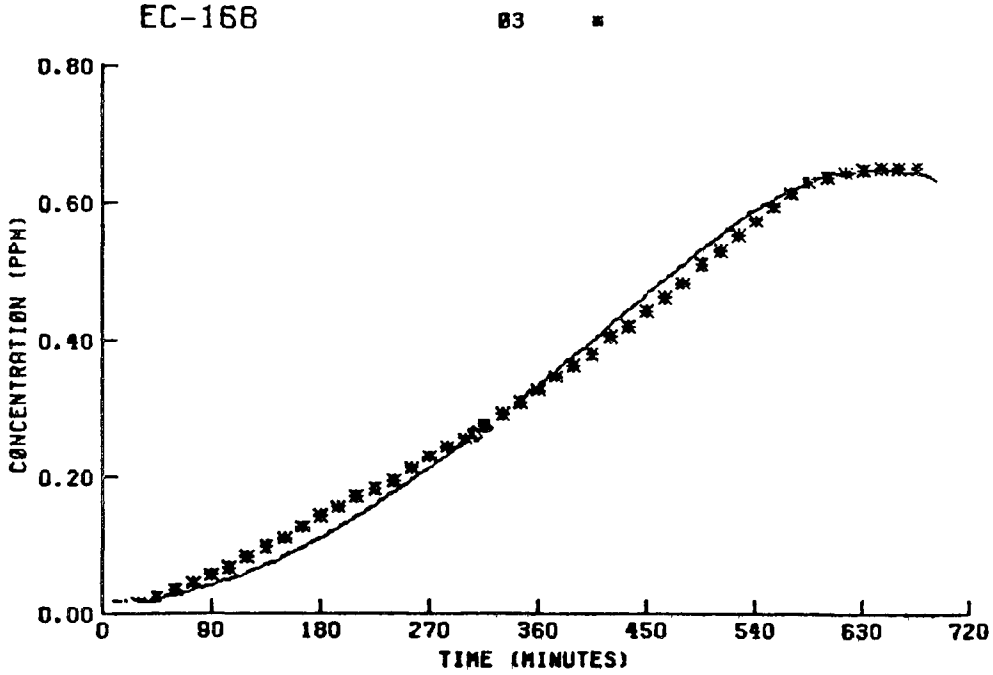

EC-163
ALD2
0.540
0.405
0.270
0.135
0.000
CONCENTRATION (PPM)
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

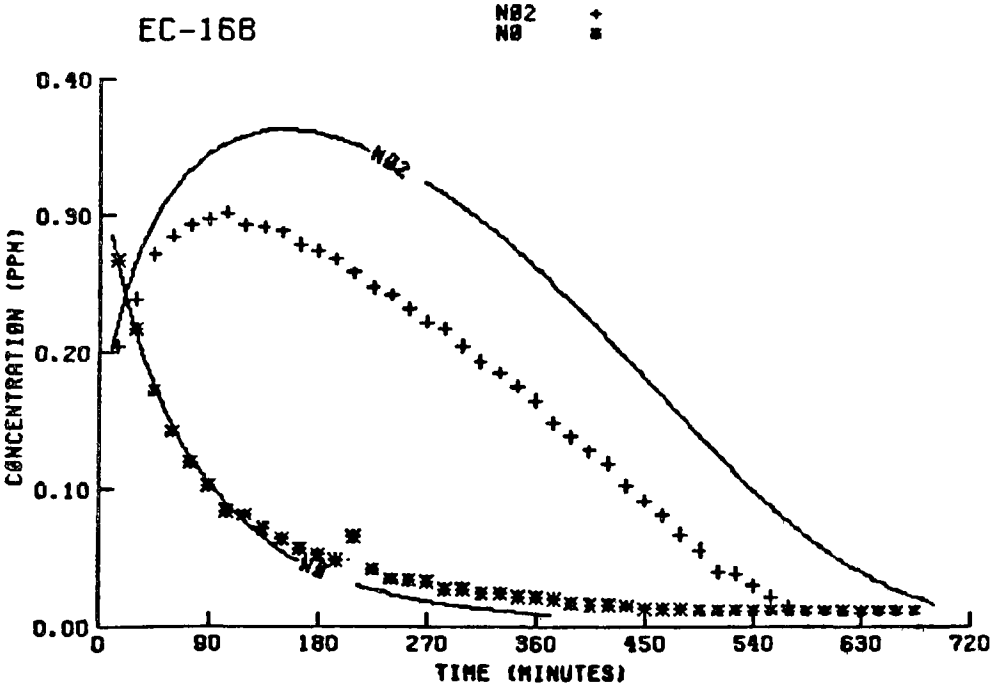

EC-163
ALD3
0.0048
0.0036
0.0024
0.0012
0.0000
CONCENTRATION (PPM)
ALD3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

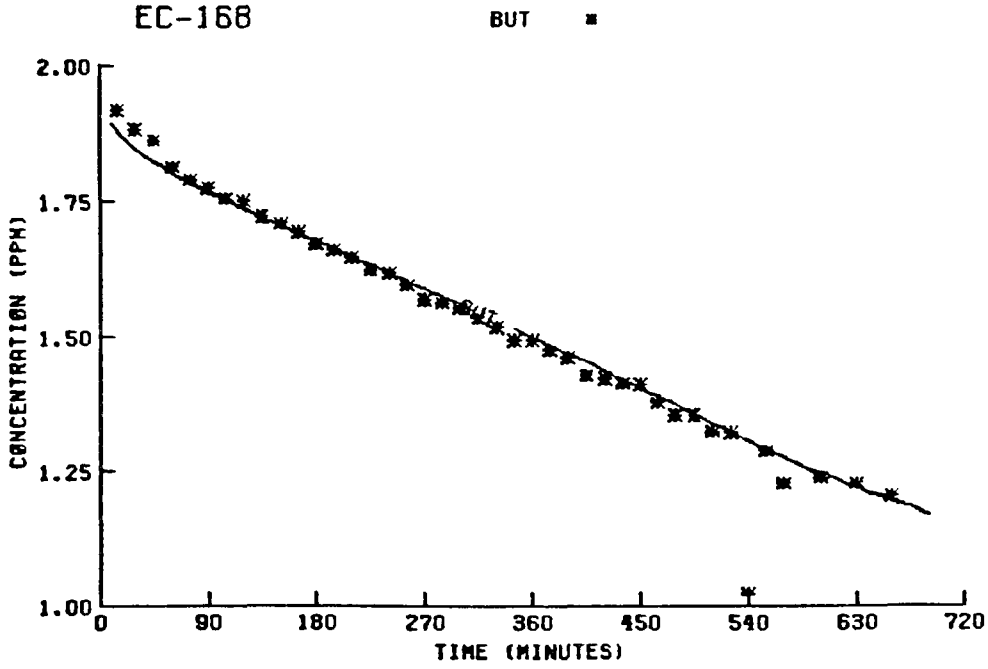

EC-163
C4N3 +
ALD4 ■
0.0052
0.0039
0.0026
0.0013
0.0000
CONCENTRATION (PPM)
ALD4
C4N3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

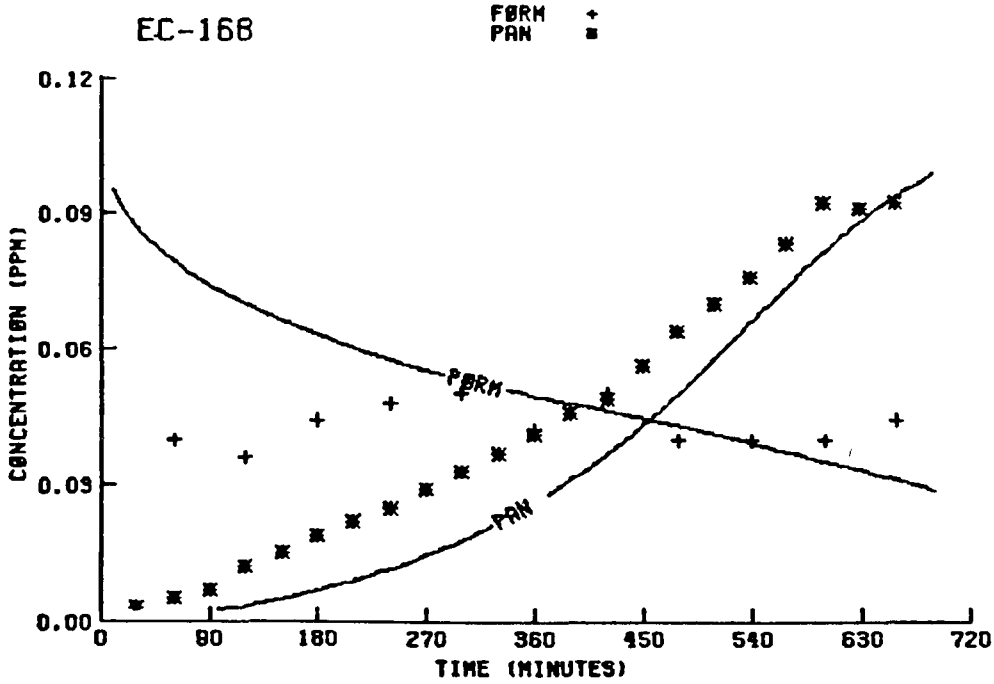

EC-163
MEN3 ■
0.0028
0.0021
0.0014
0.0007
0.0000
CONCENTRATION (PPM)
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

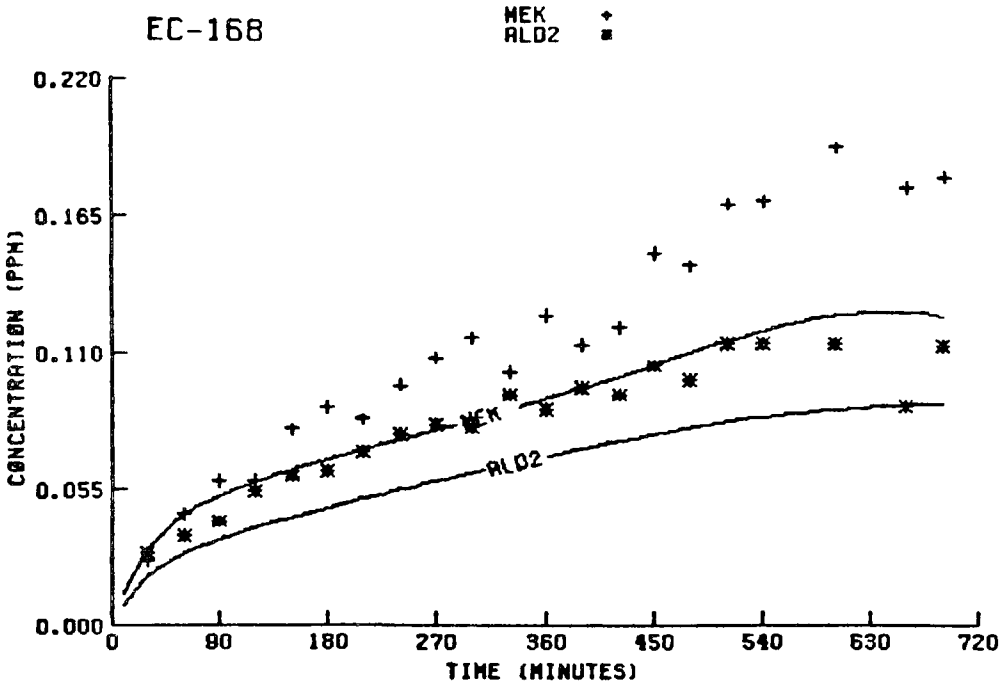

EC-163
SCN3
0.016
0.012
0.008
0.004
0.000
CONCENTRATION (PPM)
SCN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

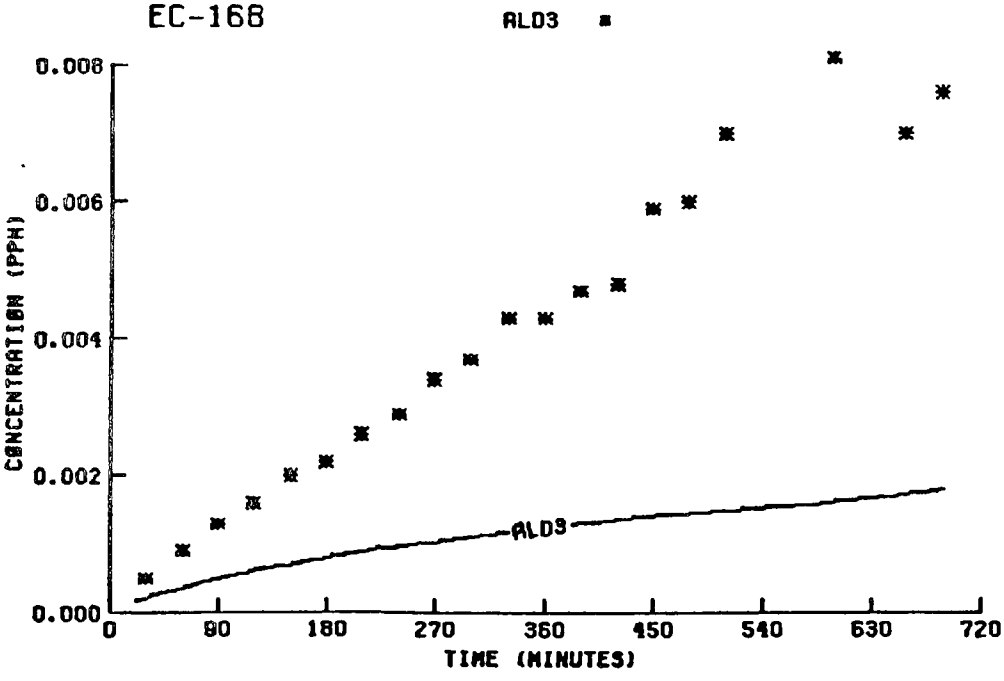

EC-168
03
0.80
0.60
0.40
0.20
0.00
CONCENTRATION (PPM)
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

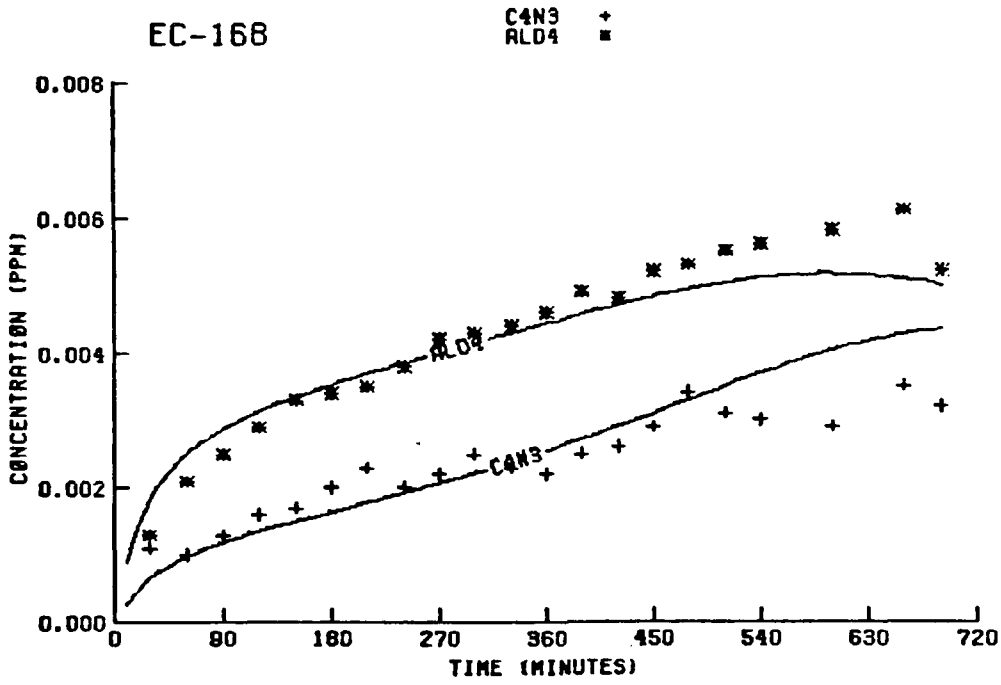

EC-168
NO2
NO
0.40
0.90
0.20
0.10
0.00
CONCENTRATION (PPM)
NO2
NO
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

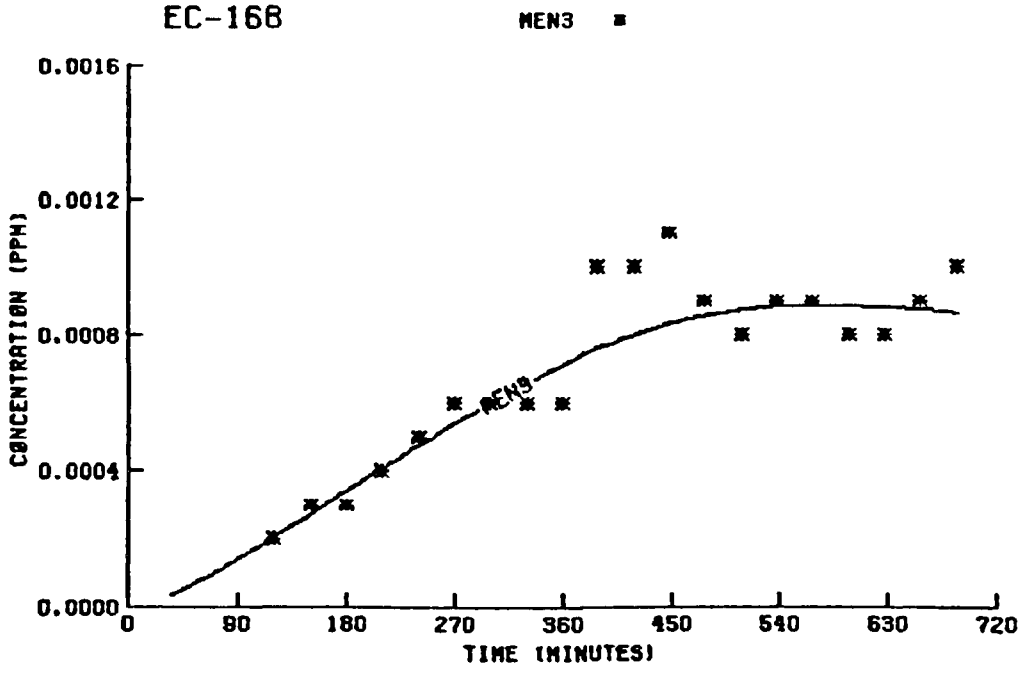

EC-168
BUT
2.00
1.75
1.50
1.25
1.00
CONCENTRATION (PPM)
0
90
180
270
360
450
540
630
720
TIME (MINUTES)
BUT

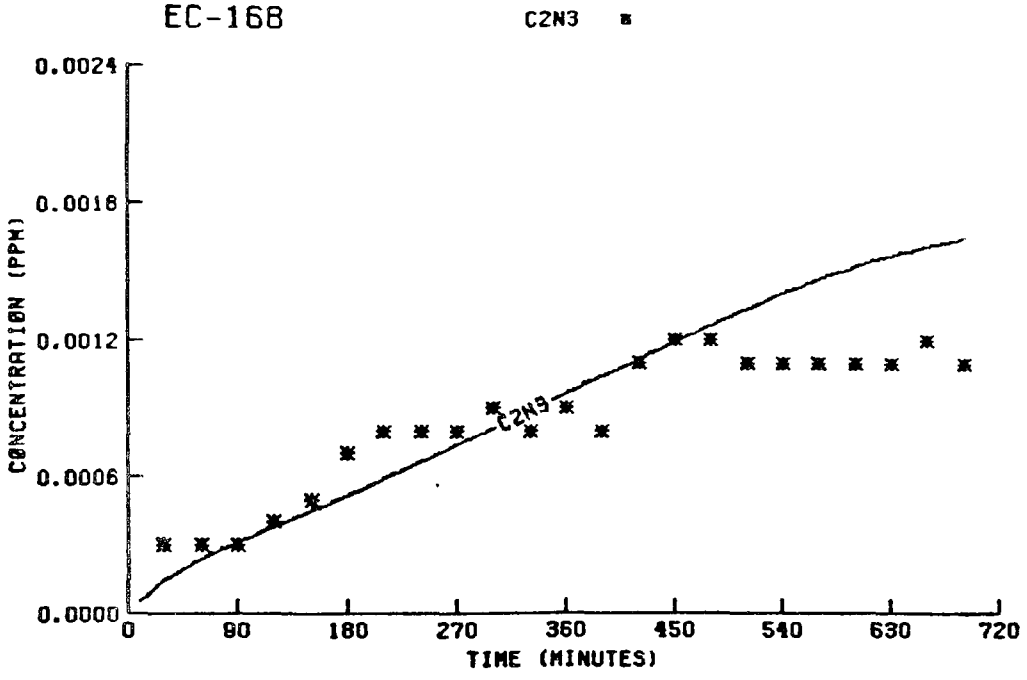

EC-168
FORM
PAN
0.12
0.09
0.06
0.03
0.00
CONCENTRATION (PPM)
0
90
180
270
360
450
540
630
720
TIME (MINUTES)
FORM
PAN

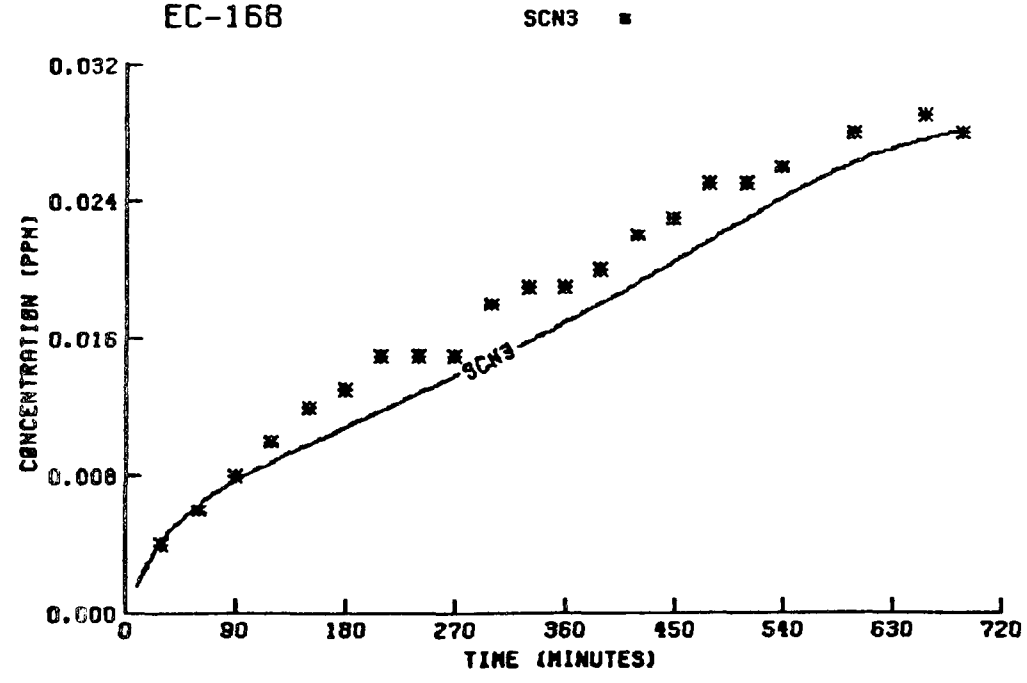

EC-168
MEK
ALD2
0.220
0.165
0.110
0.055
0.000
CONCENTRATION (PPM)
MEK
ALD2
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

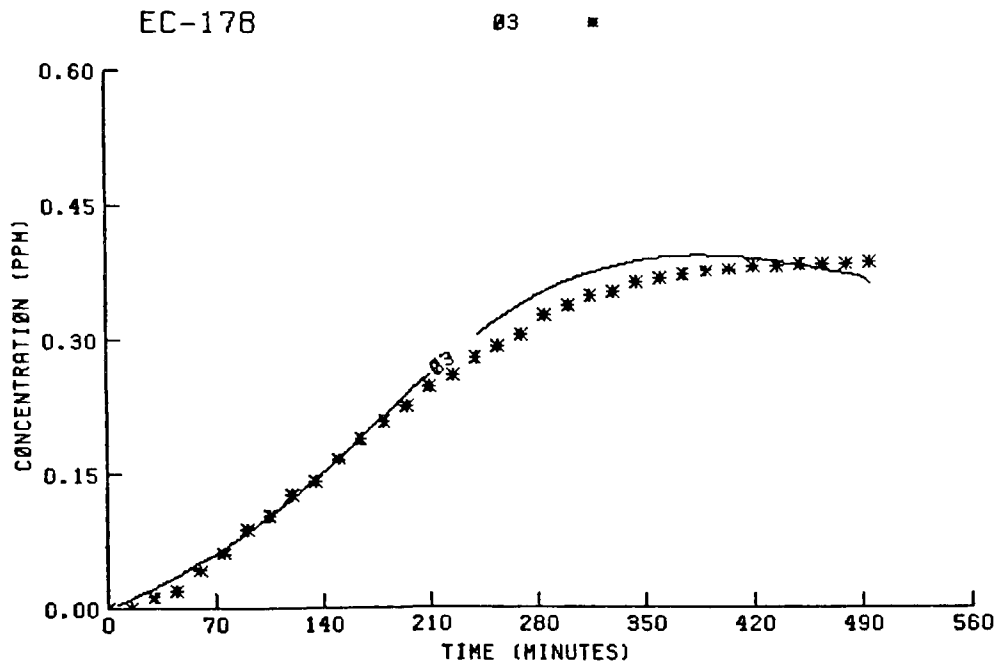

EC-168
ALD3
0.008
0.006
0.004
0.002
0.000
CONCENTRATION (PPM)
ALD3
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

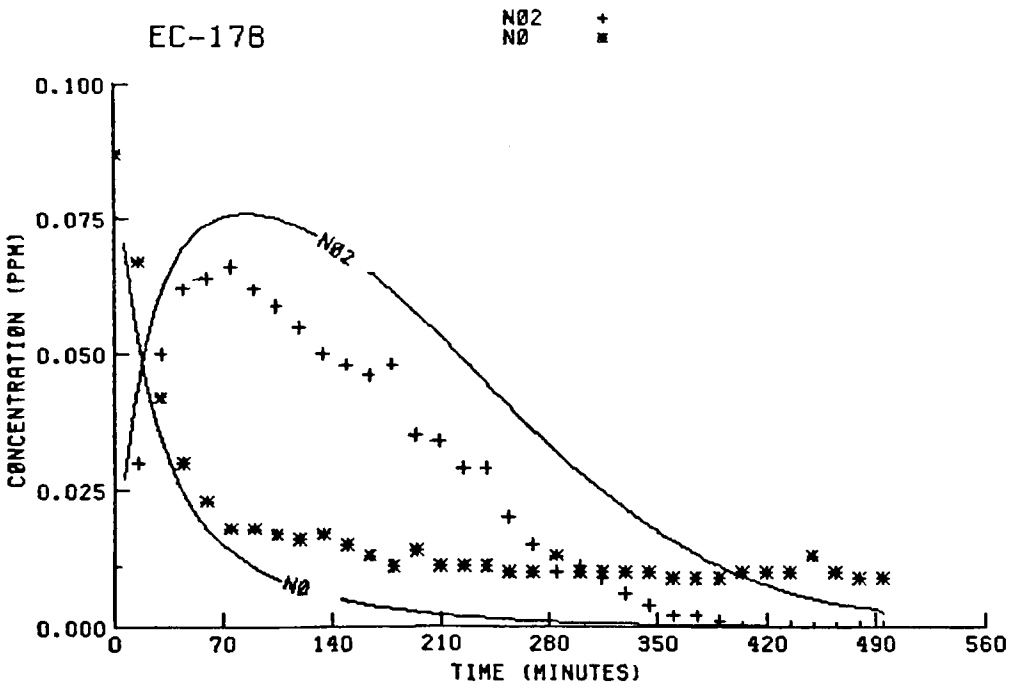

EC-168
C4N3 +
ALD4 *
0.008
0.006
0.004
0.002
0.000
CONCENTRATION (PPM)
ALD4
C4N3
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

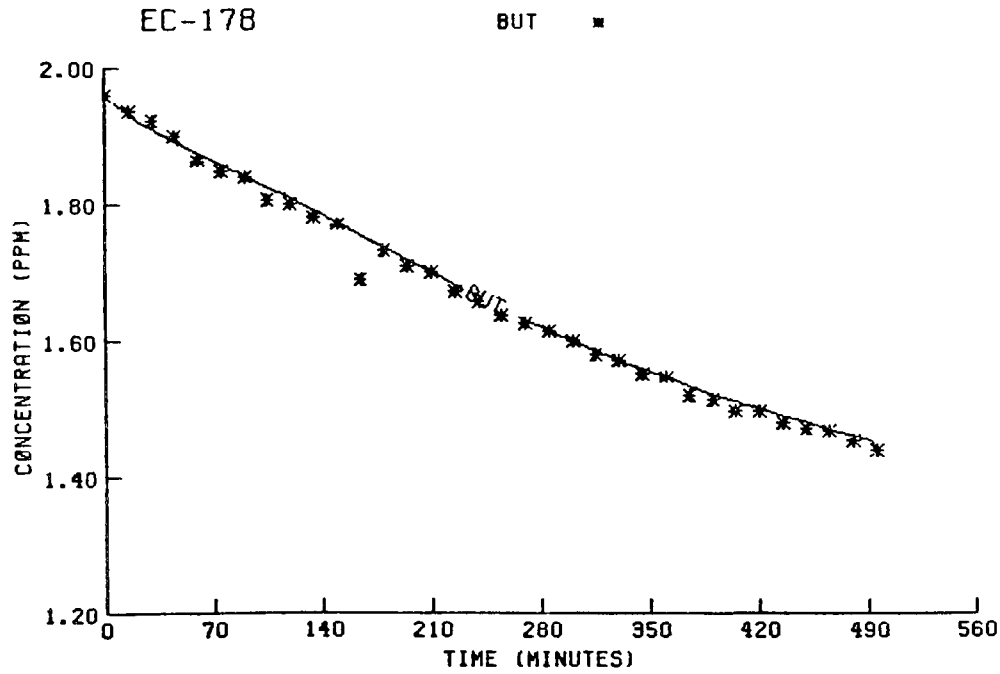

EC-168
MEN3 *
0.0016
0.0012
0.0008
0.0004
0.0000
CONCENTRATION (PPM)
MEN3
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

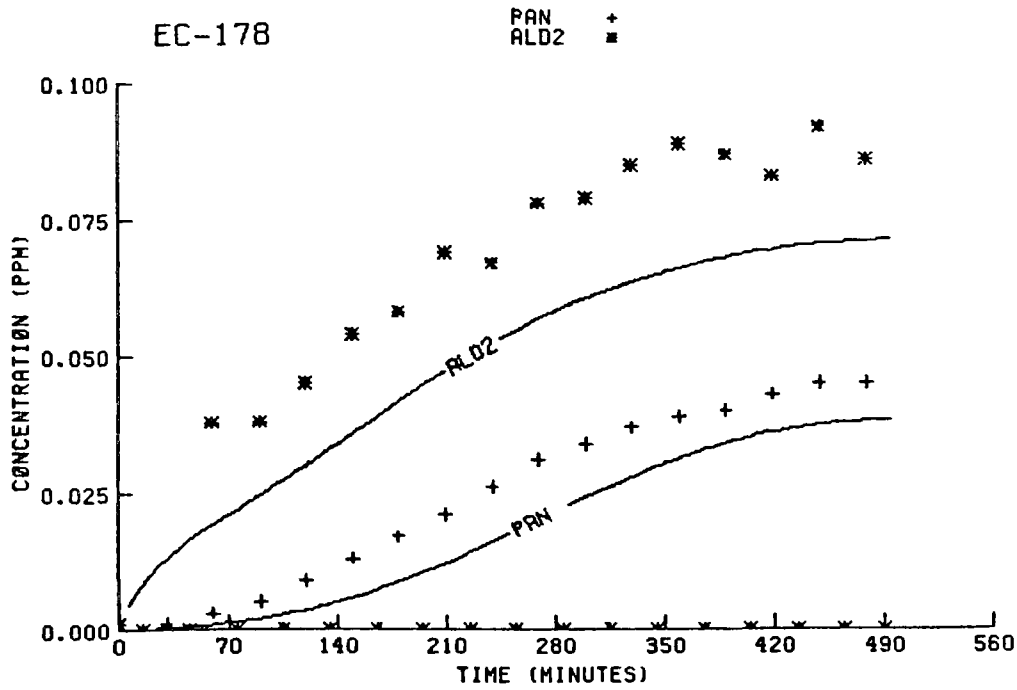

EC-168
C2N3
0.0024
0.0018
0.0012
0.0006
0.0000
CONCENTRATION (PPM)
C2N3
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

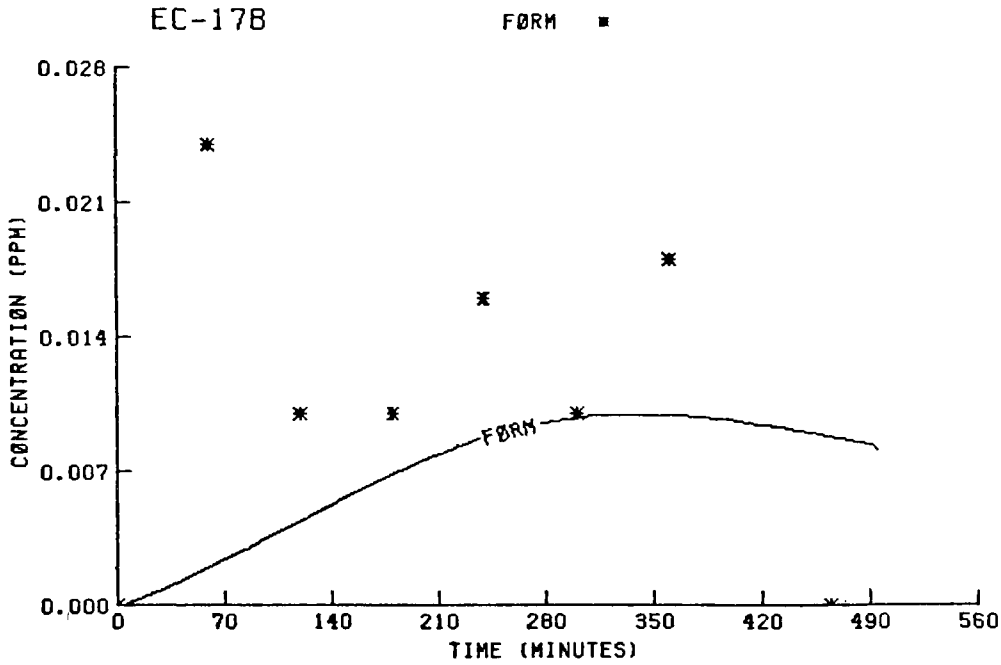

EC-168
SCN3
0.032
0.024
0.016
0.008
0.000
CONCENTRATION (PPM)
SCN3
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

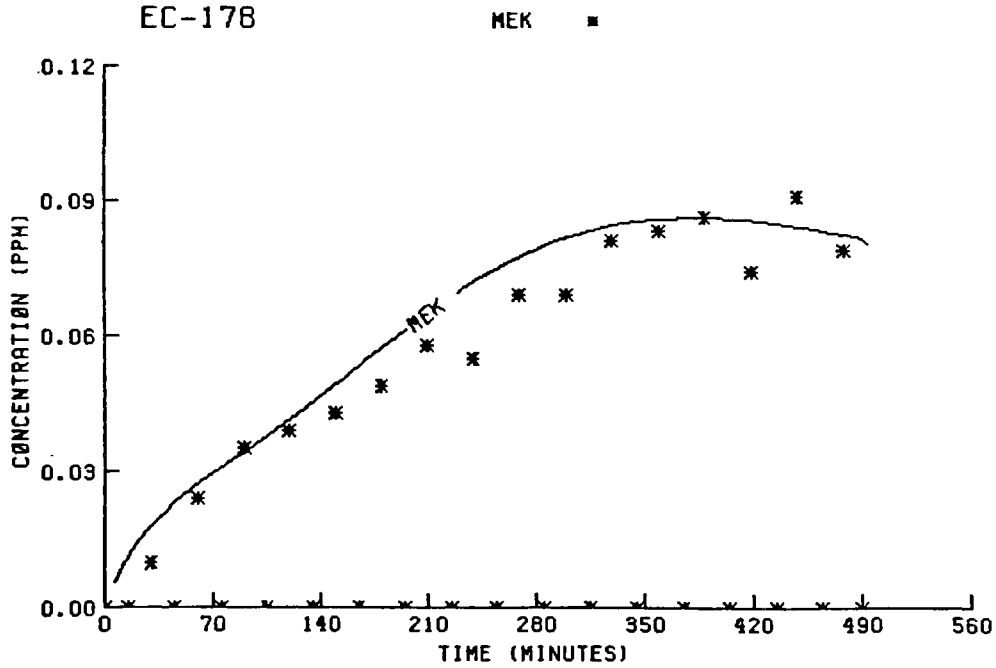

EC-178
Ø3
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
0
70
140
210
280
350
420
490
560
TIME (MINUTES)
Ø3

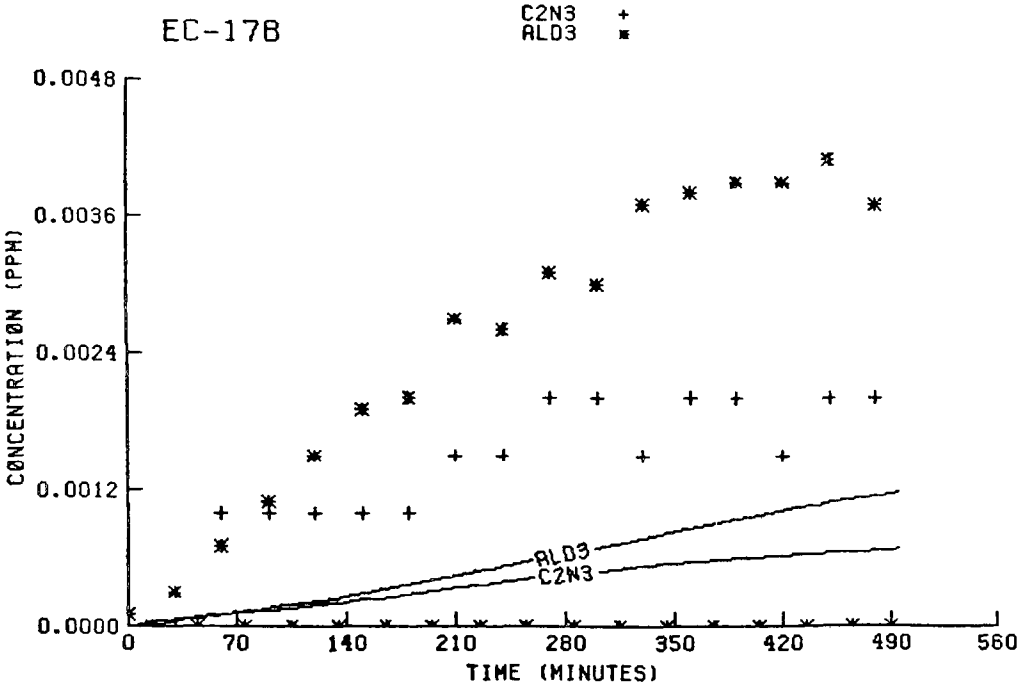

EC-178
NØ2
NØ
0.100
0.075
0.050
0.025
0.000
CØNCENTRATIØN (PPM)
0
70
140
210
280
350
420
490
560
TIME (MINUTES)
NØ2
NØ

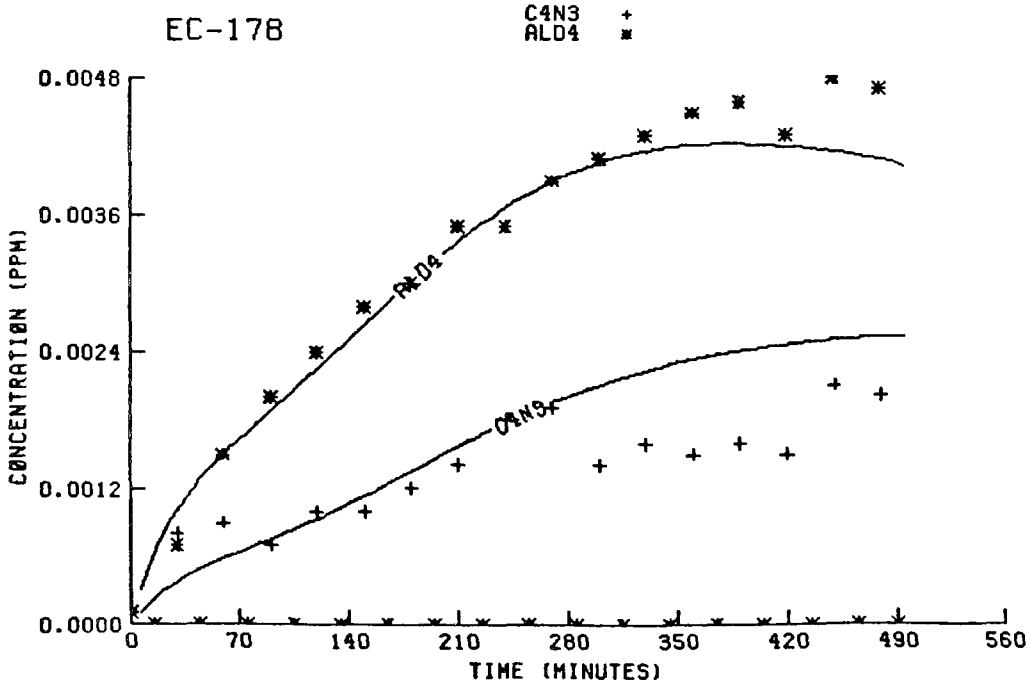

EC-178
BUT
2.00
1.80
1.60
1.40
1.20
CONCENTRATION (PPM)
BUT
0
70
140
210
280
350
420
490
560
TIME (MINUTES)

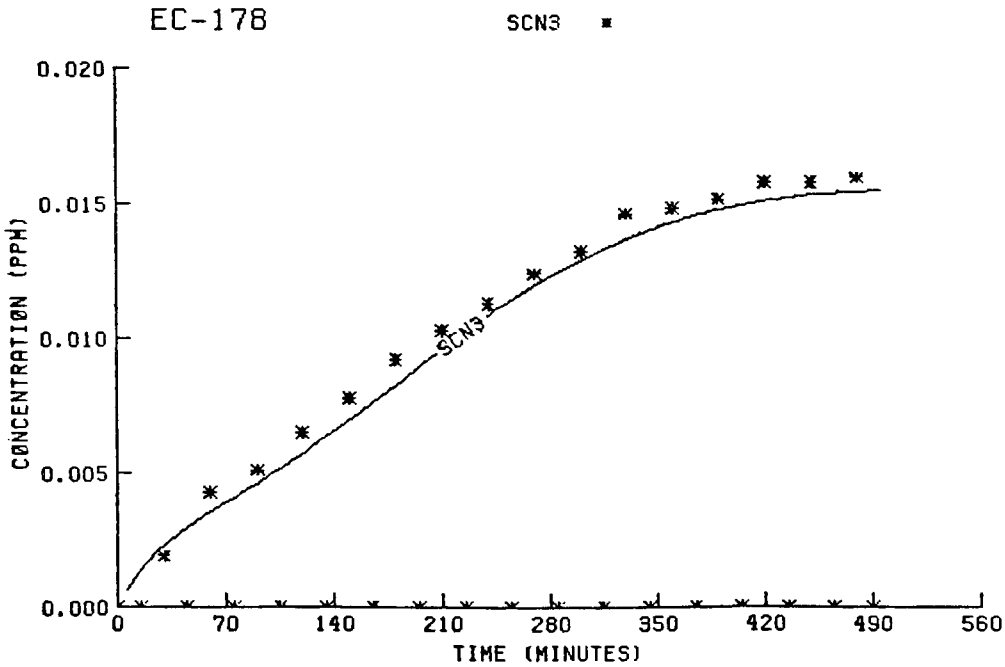

EC-178
PAN
ALD2
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
ALD2
PAN
0
70
140
210
280
350
420
490
560
TIME (MINUTES)


EC-178
FØRM
0.028
0.021
0.014
0.007
0.000
CØNCENTRATIØN (PPM)
FØRM
0
70
140
210
280
350
420
490
560
TIME (MINUTES)

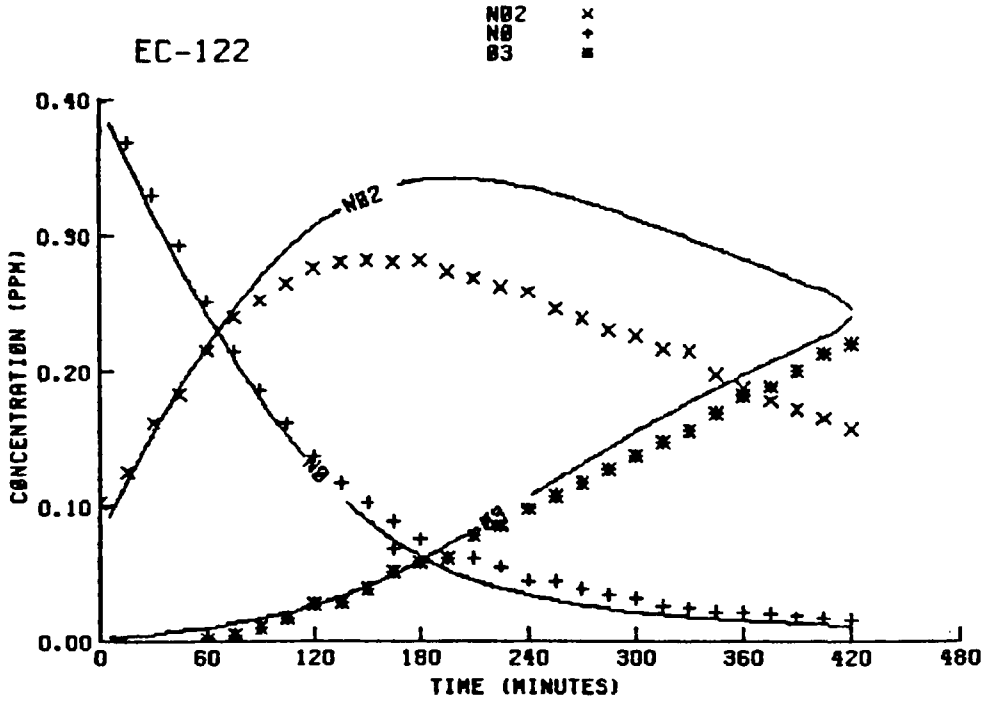

EC-178
MEK
0.12
0.09
0.06
0.03
0.00
CØNCENTRATIØN (PPM)
MEK
0
70
140
210
280
350
420
490
560
TIME (MINUTES)

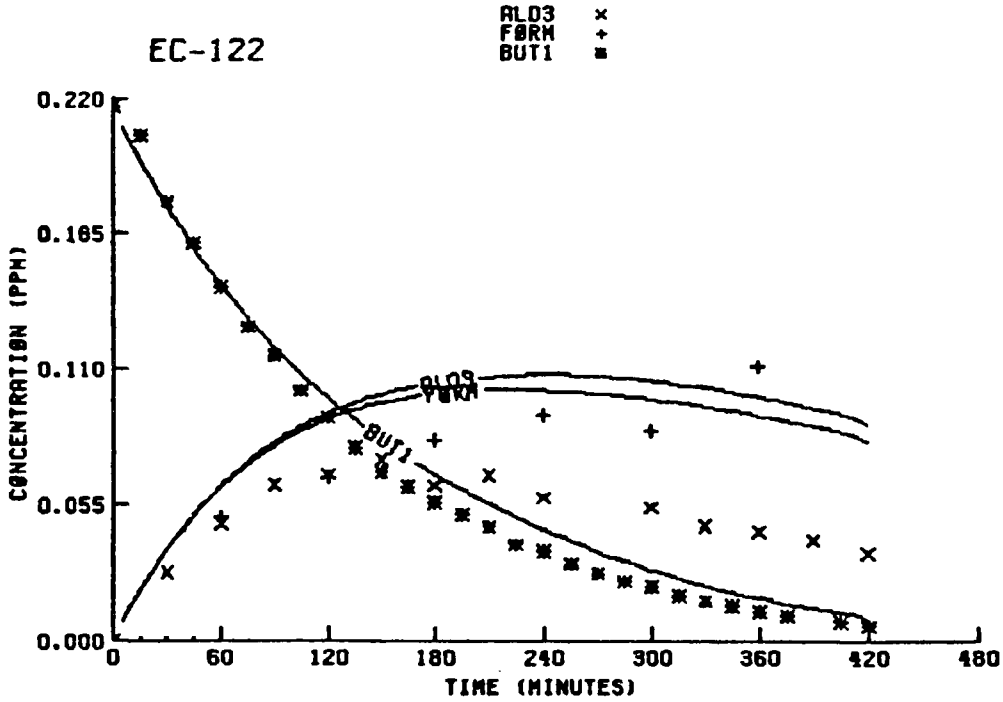

EC-178
C2N3 +
ALD3 *
0.0048
0.0036
0.0024
0.0012
0.0000
CONCENTRATION (PPM)
ALD3
C2N3
0
70
140
210
280
350
420
490
560
TIME (MINUTES)

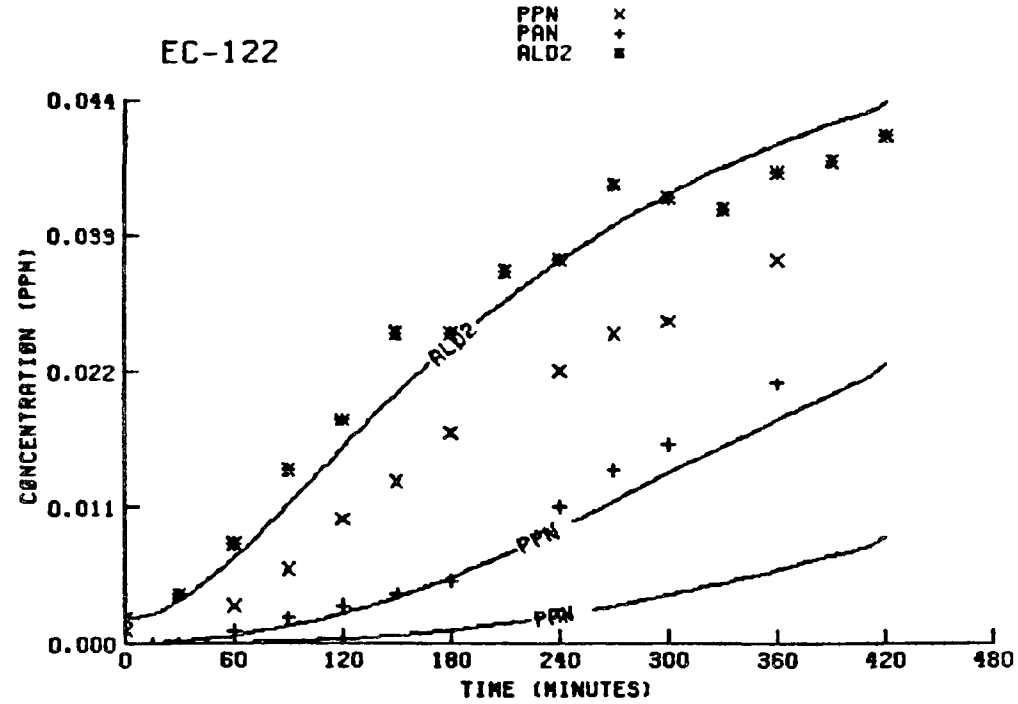

EC-178
C4N3 +
ALD4 *
0.0048
0.0036
0.0024
0.0012
0.0000
CONCENTRATION (PPM)
ALD4
C4N3
0
70
140
210
280
350
420
490
560
TIME (MINUTES)

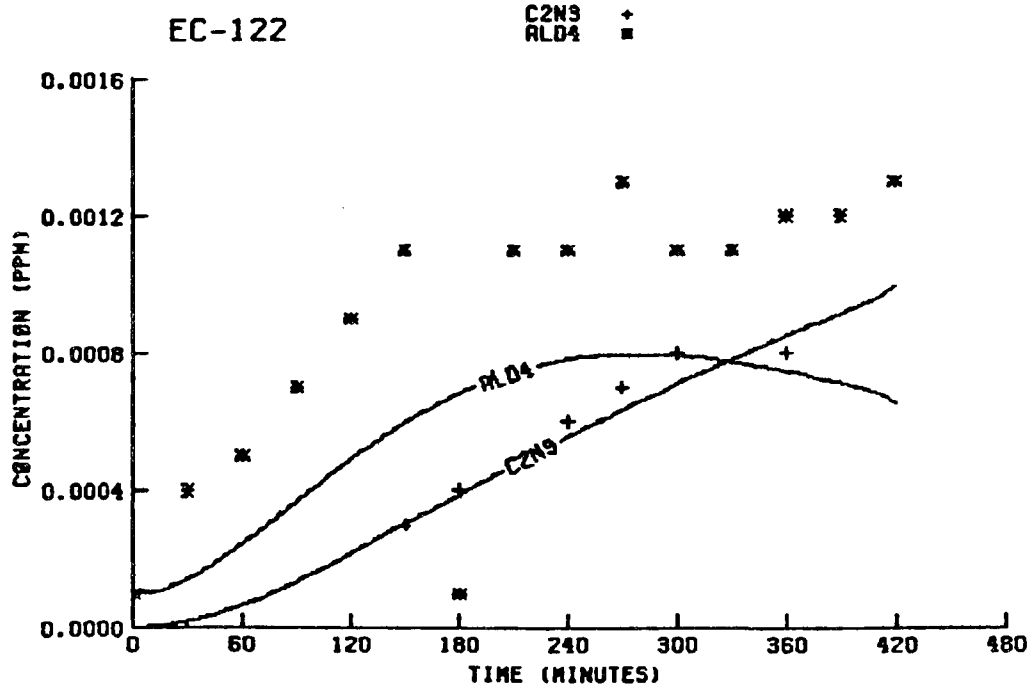

EC-178
SCN3
0.020
0.015
0.010
0.005
0.000
CONCENTRATION (PPM)
SCN3
0
70
140
210
280
350
420
490
560
TIME (MINUTES)

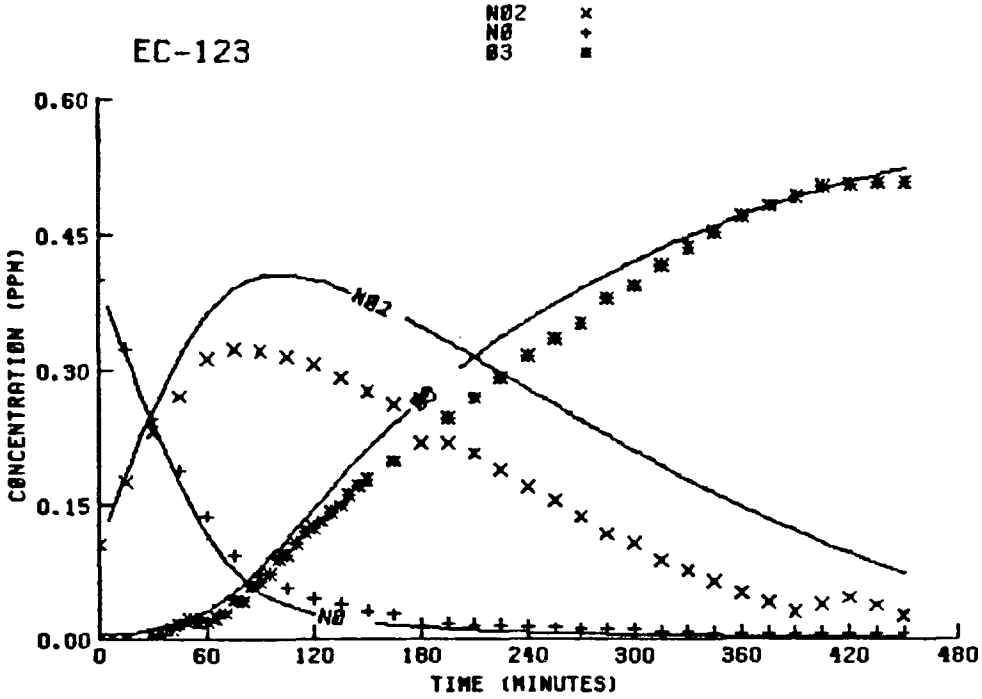
UCR 1-BUTENE EXPERIMENTS

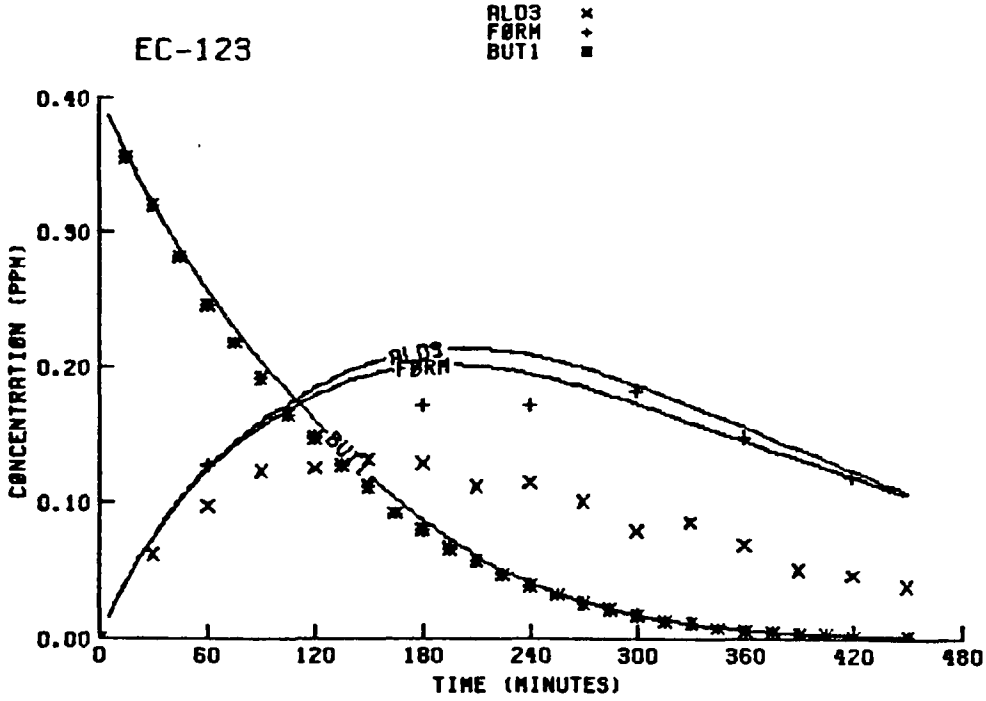

EC-122
NO2
NO
O3
CONCENTRATION (PPM)
0.40
0.30
0.20
0.10
0.00
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

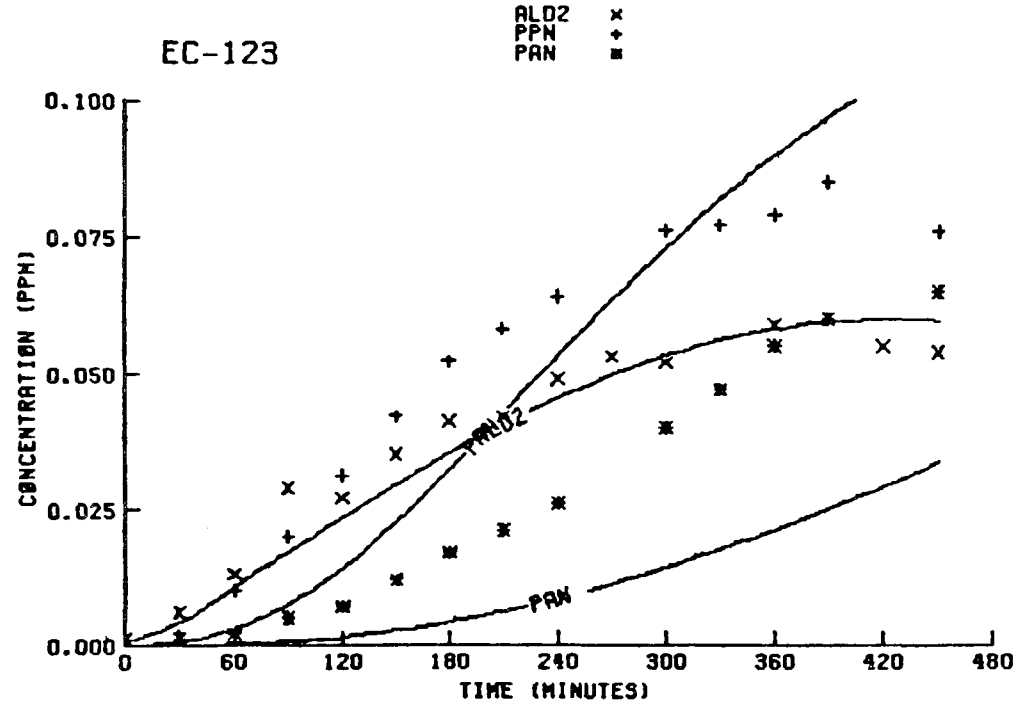

EC-122
ALD3
FORM
BUT1
CONCENTRATION (PPM)
0.220
0.165
0.110
0.055
0.000
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

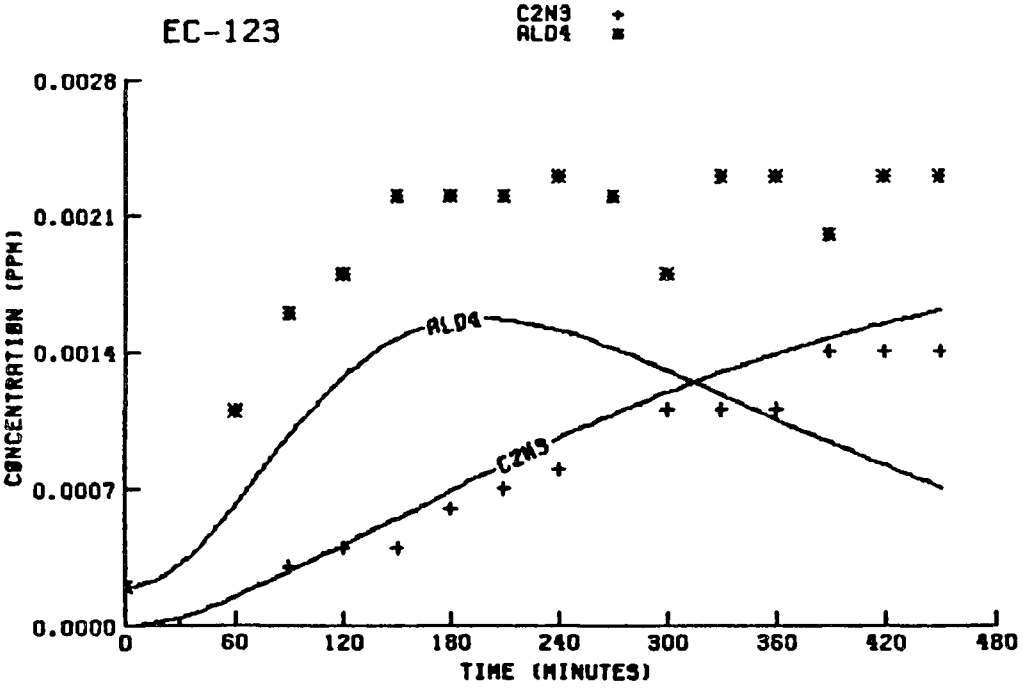

EC-122
PPN
PAN
ALD2
0.044
0.033
0.022
0.011
0.000
CONCENTRATION (PPM)
ALD2
PPN
PAN
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

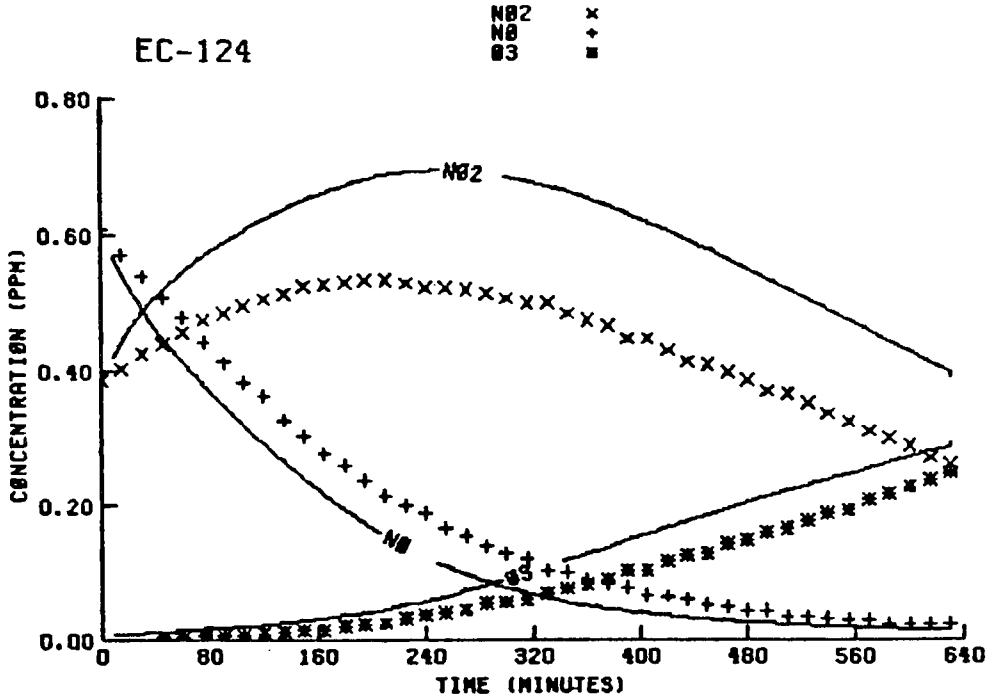

EC-122
C2N3
ALD4
0.0016
0.0012
0.0008
0.0004
0.0000
CONCENTRATION (PPM)
ALD4
C2N3
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

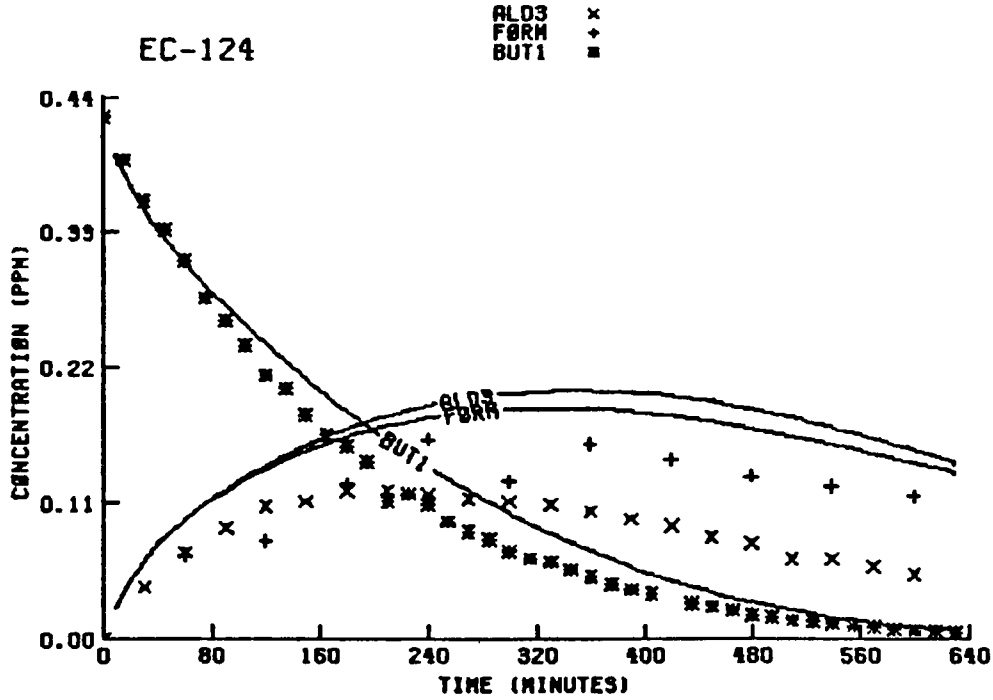

EC-123
NØ2
NØ
Ø3
CØNCENTRATIØN (PPM)
0.60
0.45
0.30
0.15
0.00
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

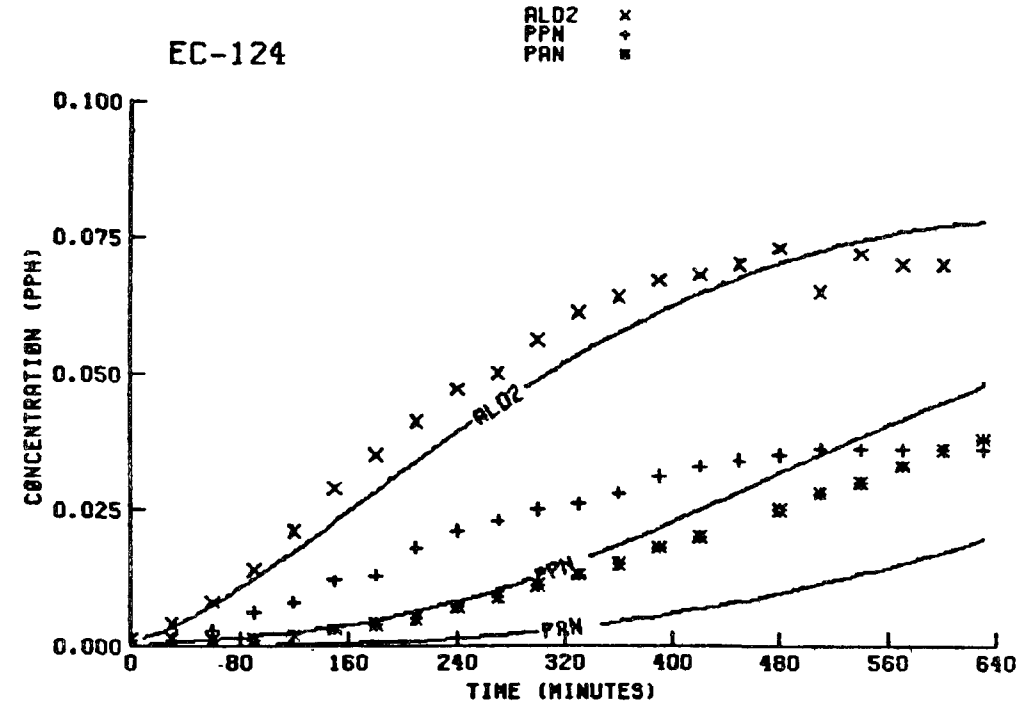

EC-123
ALD3
FØRM
BUT1
CØNCENTRATIØN (PPM)
0.40
0.30
0.20
0.10
0.00
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

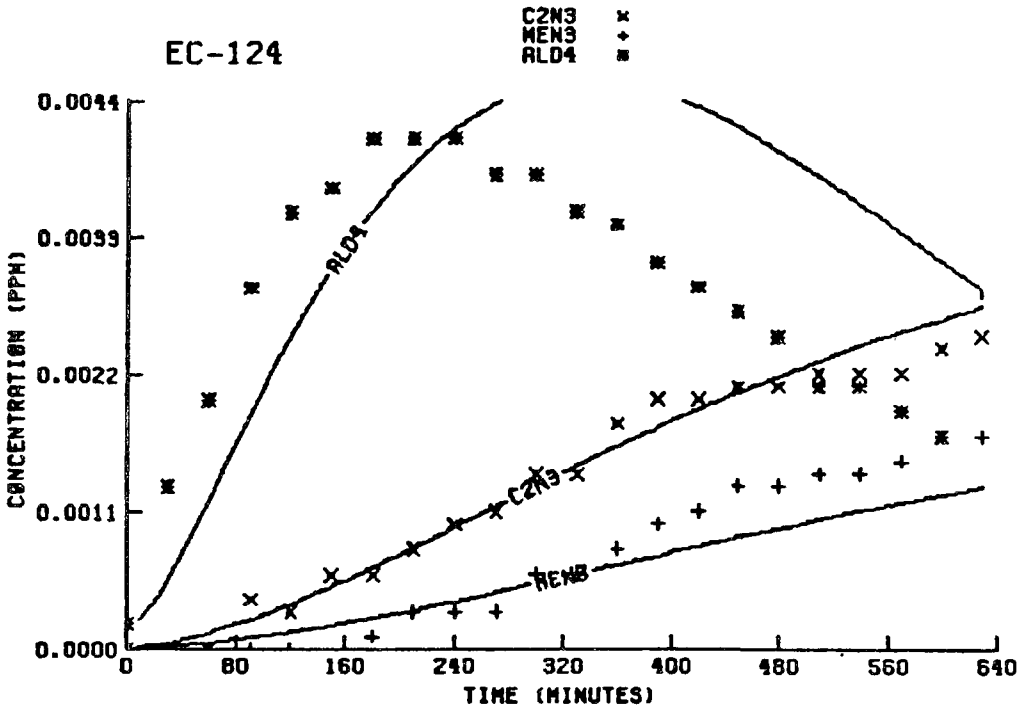

EC-123
ALD2
PPN
PAN
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
PPN
ALD2
PAN
0
60
120
180
240
300
360
420
480
TIME (MINUTES)


EC-123
C2N3
ALD4
0.0028
0.0021
0.0014
0.0007
0.0000
CONCENTRATION (PPM)
ALD4
C2N3
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

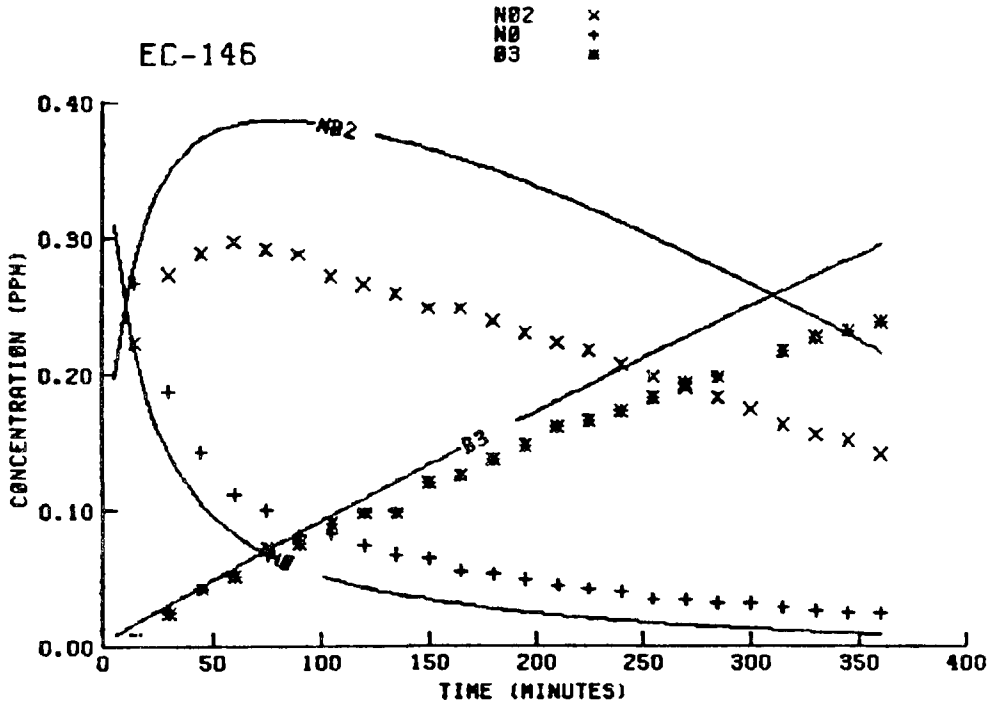

EC-124
NO2
NO
O3
0.80
0.60
0.40
0.20
0.00
CONCENTRATION (PPM)
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

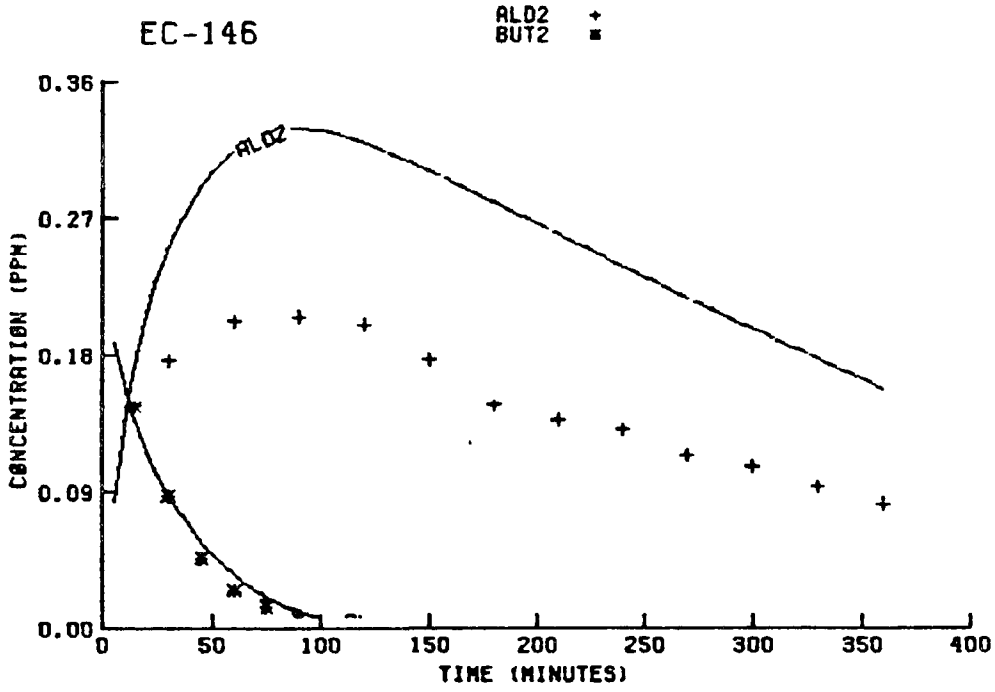

EC-124
ALD3
FORM
BUT1
0.44
0.33
0.22
0.11
0.00
CONCENTRATION (PPM)
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

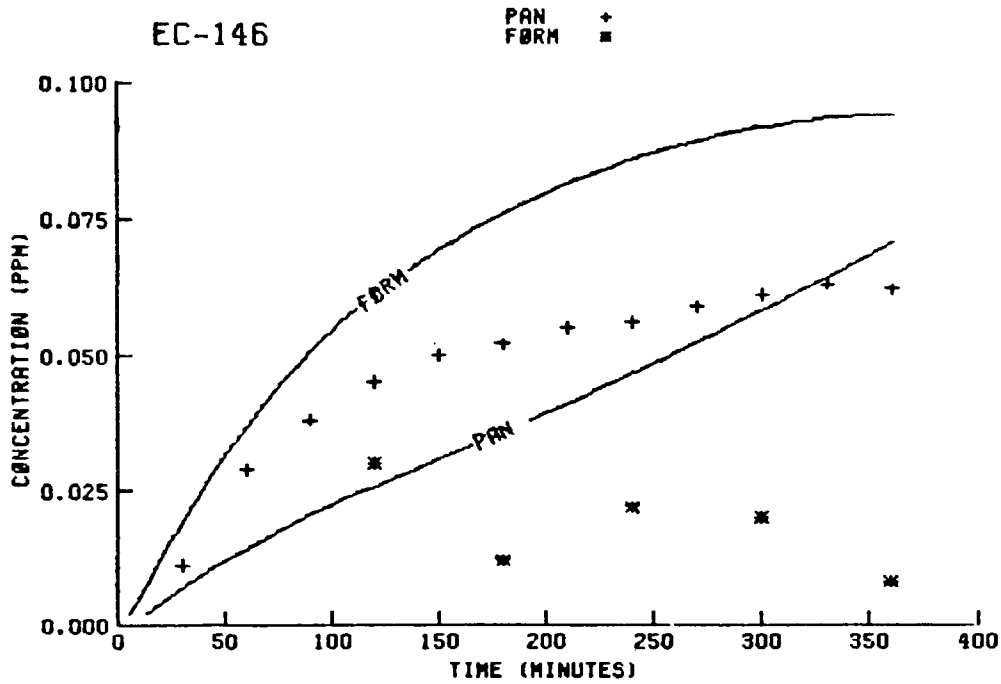

EC-124
ALD2
PPN
PAN
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

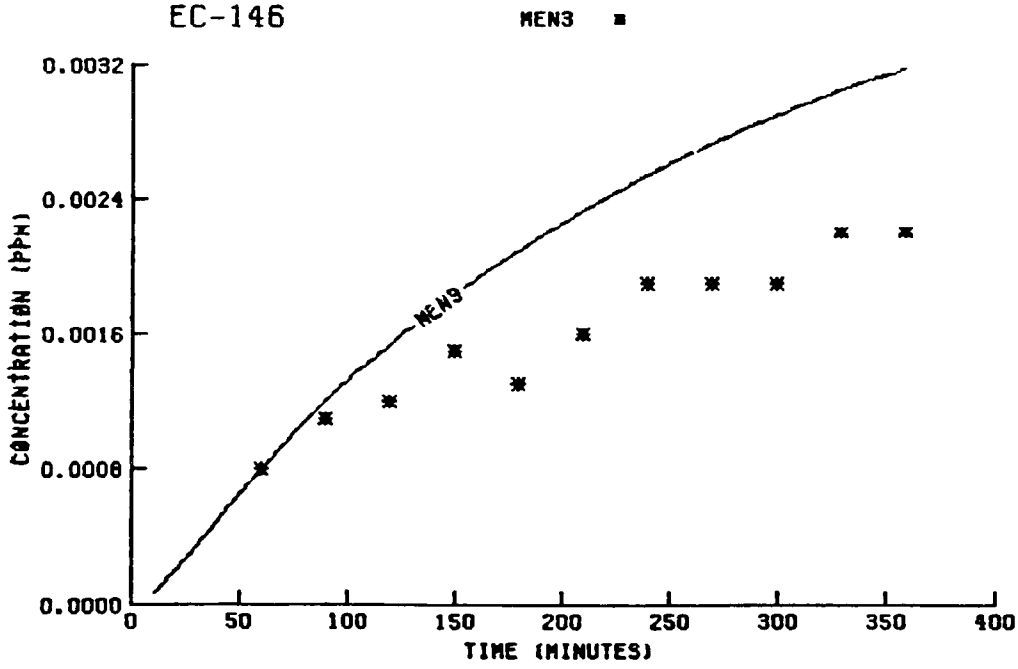

EC-124
C2N3
MEN3
ALD4
0.0044
0.0033
0.0022
0.0011
0.0000
CONCENTRATION (PPM)
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

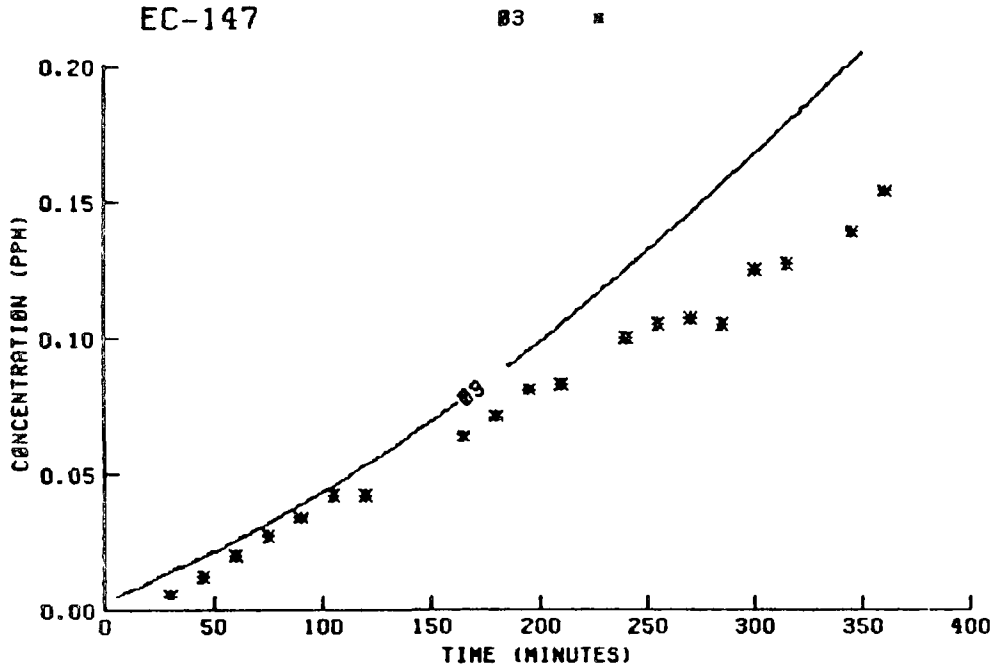
UCR TRANS-2-BUTENE EXPERIMENTS

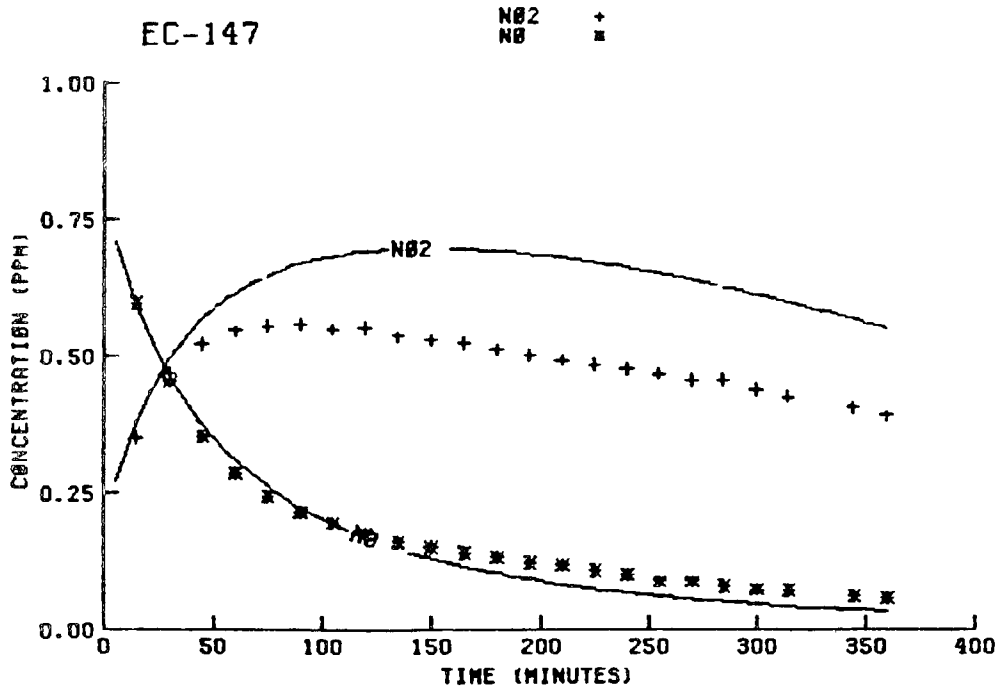

EC-146
NO2
NO
O3
NO2
O3
NO
0.40
0.30
0.20
0.10
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

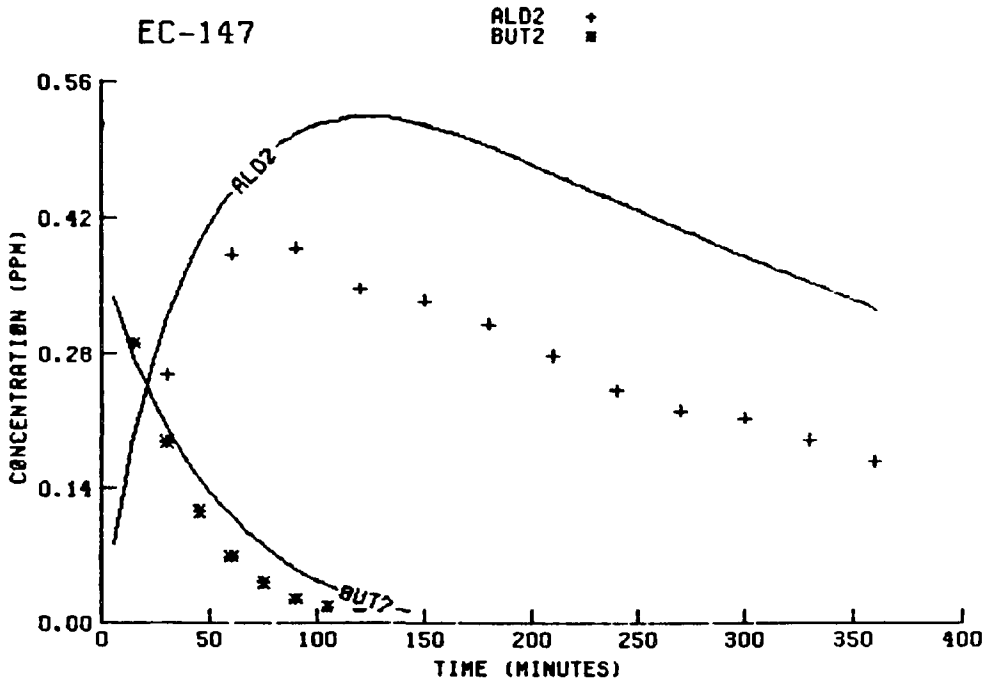

EC-146
ALD2
BUT2
ALD2
0.36
0.27
0.18
0.09
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

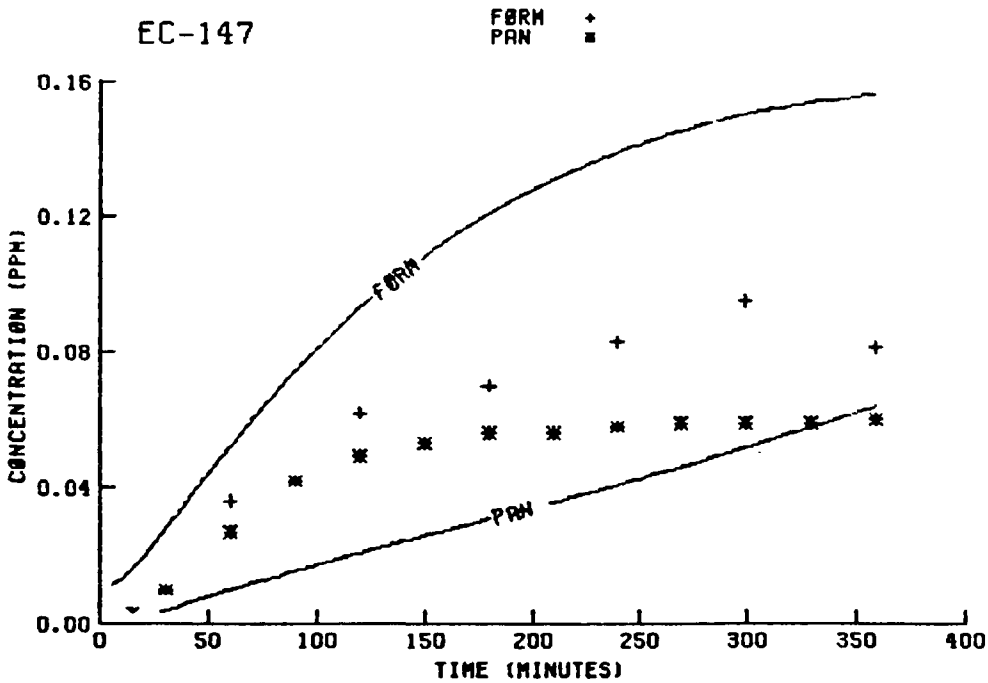

EC-146
PAN +
FORM ■
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
FORM
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

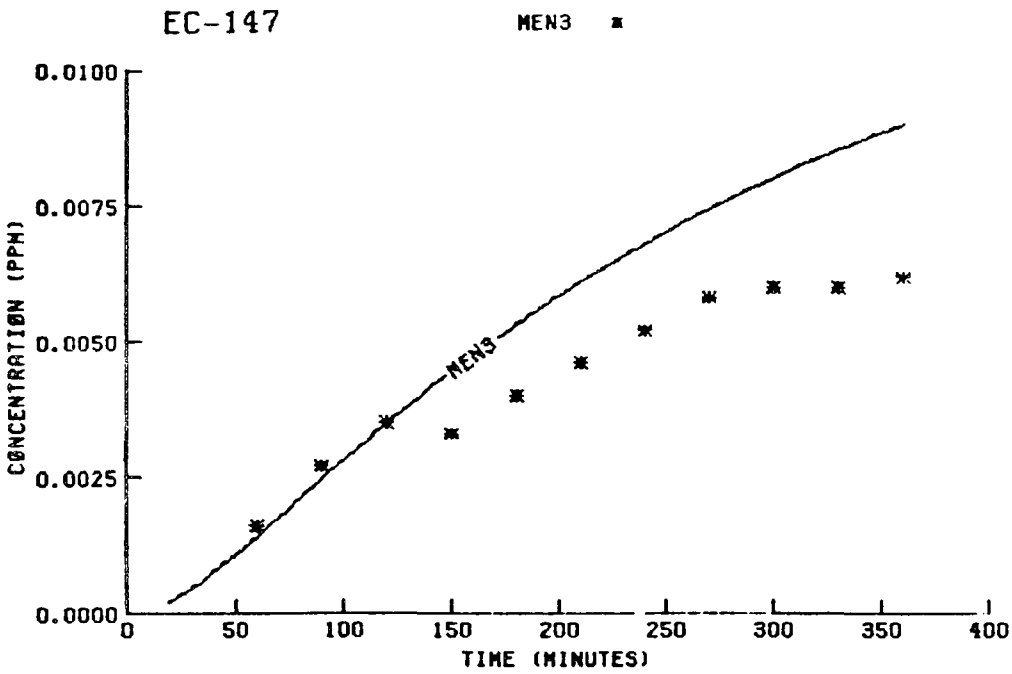

EC-146
MEN3 ■
0.0032
0.0024
0.0016
0.0008
0.0000
CONCENTRATION (PPM)
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

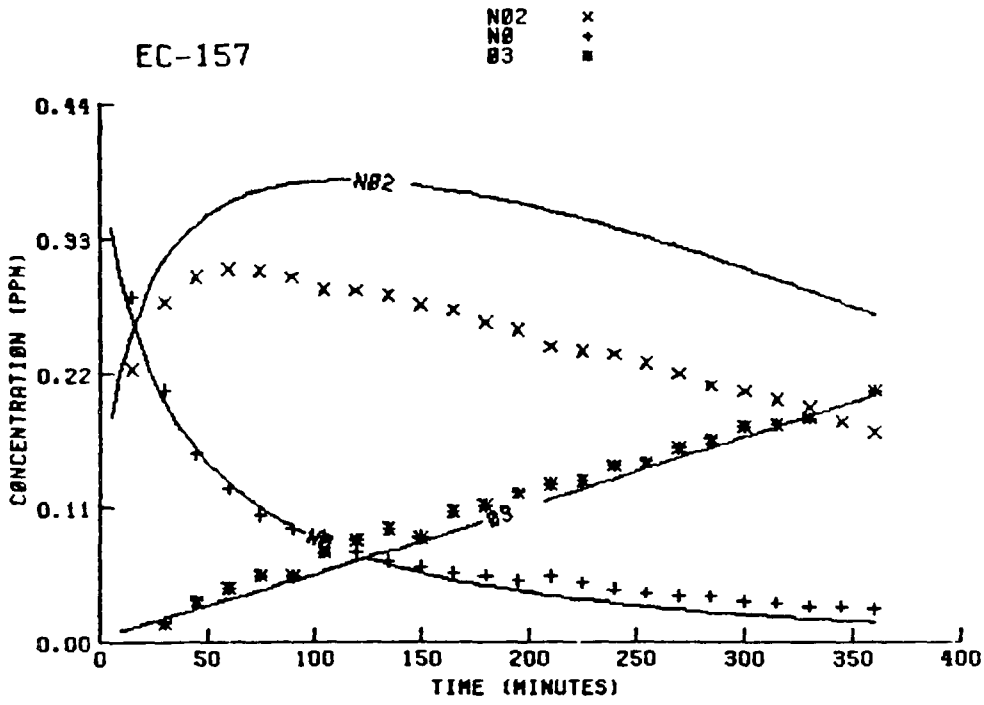

EC-147
Ø3
0.20
0.15
0.10
0.05
0.00
CØNCENTRATIØN (PPH)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

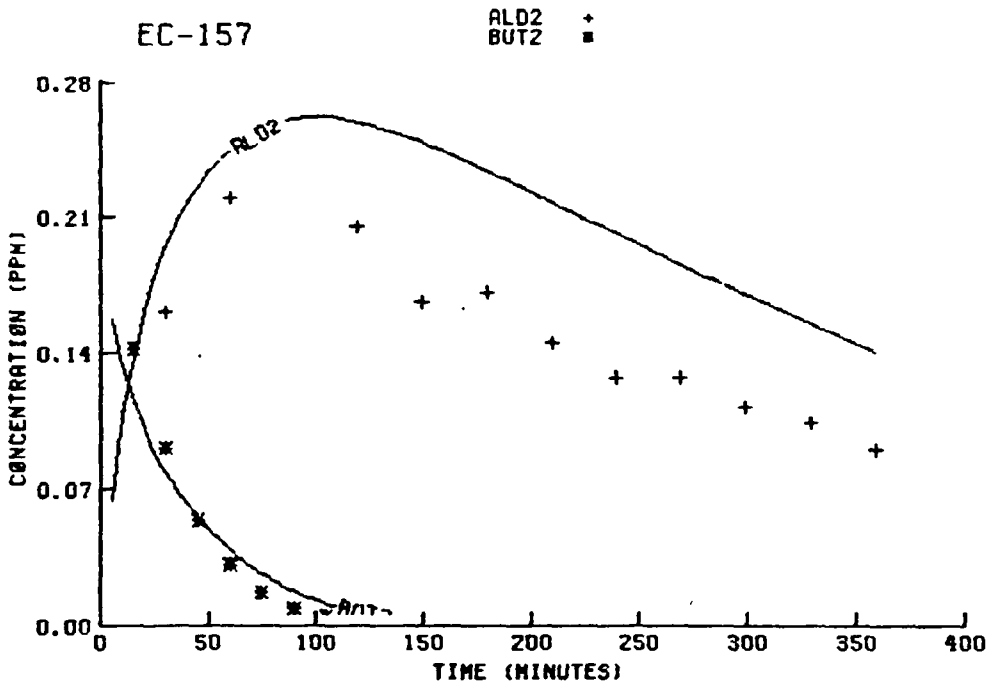

EC-147
NØ2
NØ
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPH)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

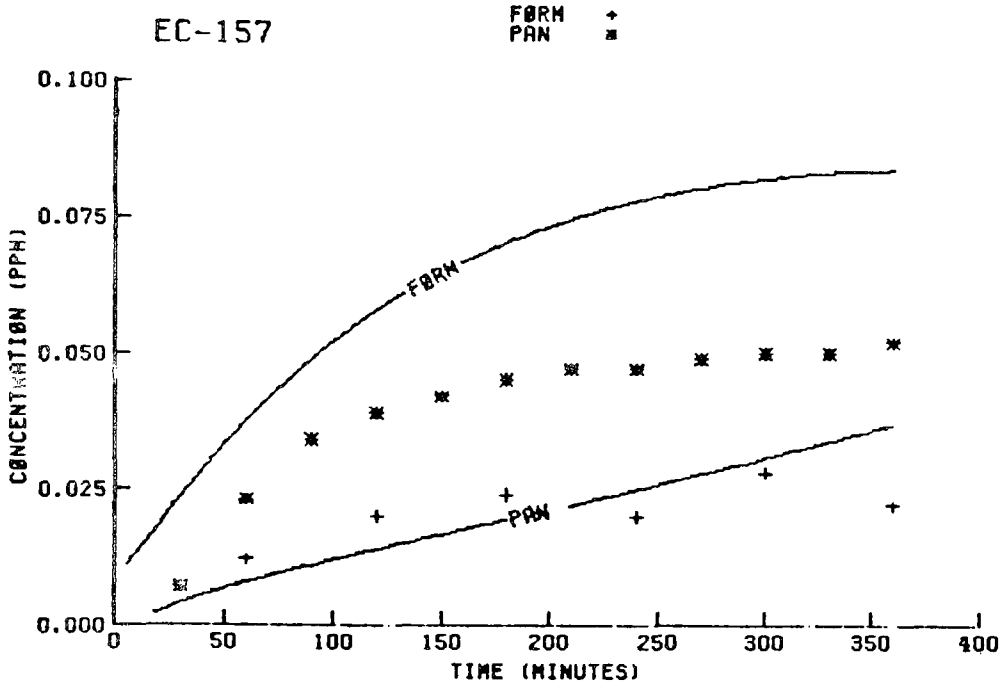

EC-147
ALD2 +
BUT2 ■
0.56
0.42
0.28
0.14
0.00
CONCENTRATION (PPM)
ALD2
BUT2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

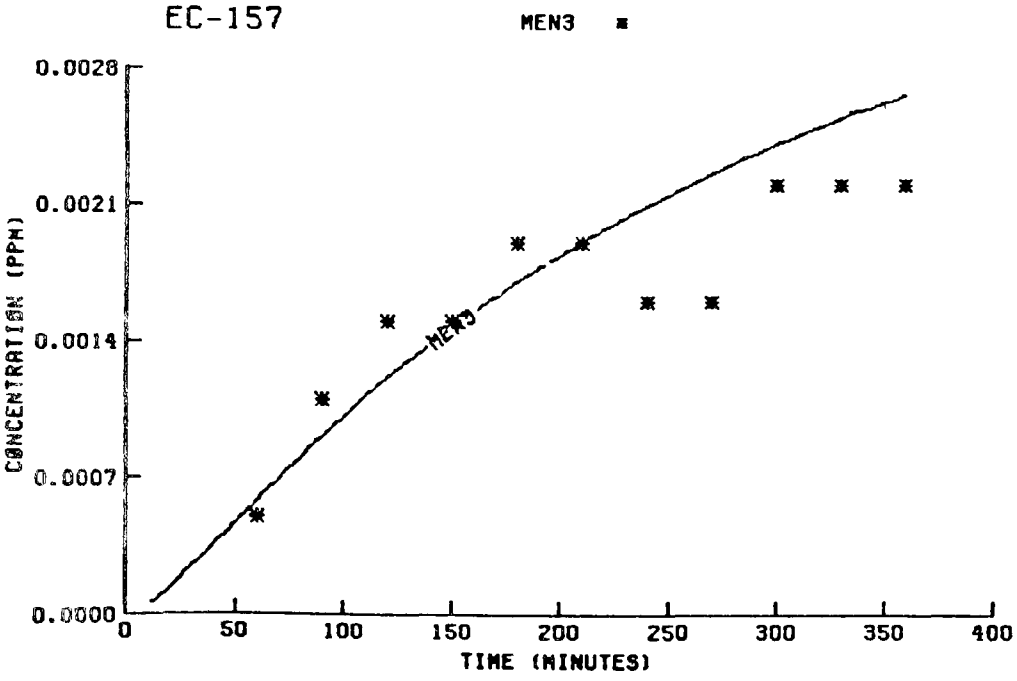

EC-147
FORM +
PAN ■
0.16
0.12
0.08
0.04
0.00
CONCENTRATION (PPM)
FORM
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-147
MEN3
0.0100
0.0075
0.0050
0.0025
0.0000
CONCENTRATION (PPM)
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

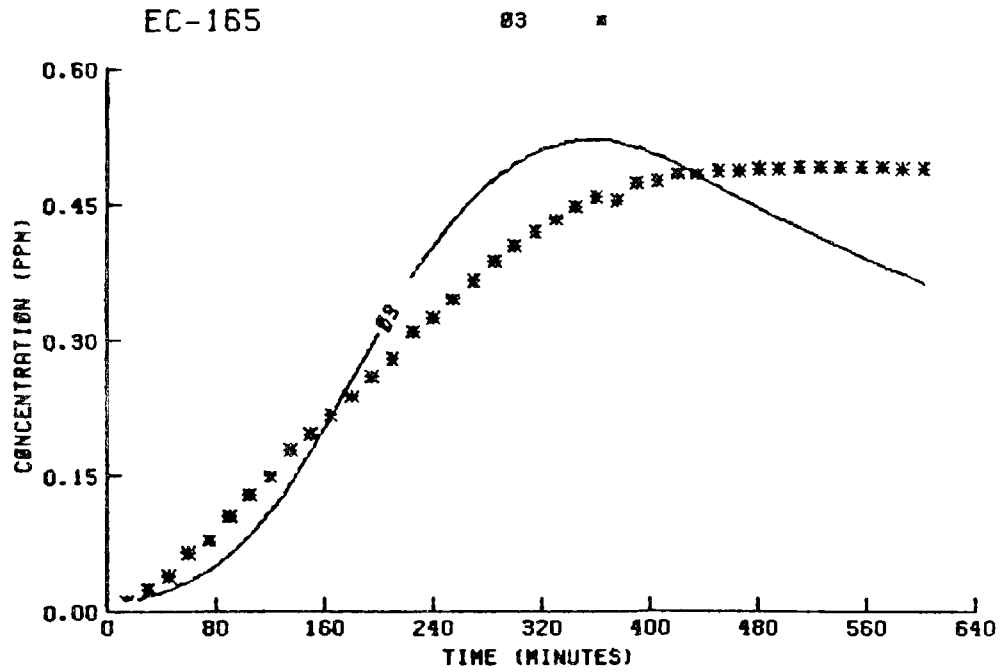

EC-157
NØ2 ×
NØ +
Ø3 ■
0.44
0.33
0.22
0.11
0.00
CØNCENTRATIØN (PPM)
NØ2
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

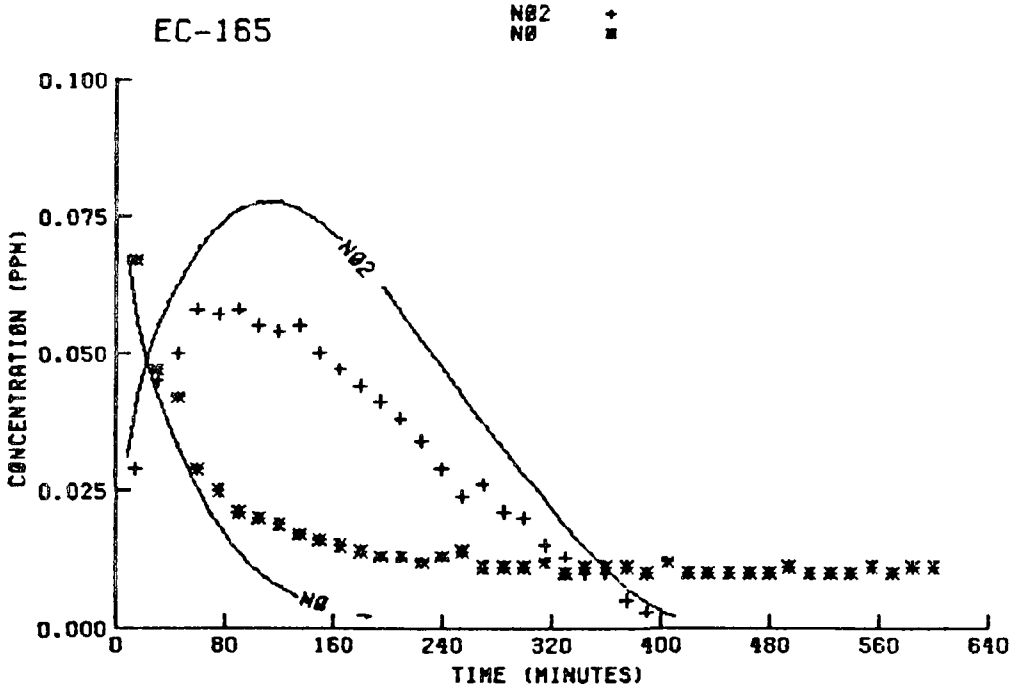

EC-157
ALD2 +
BUT2 ■
0.28
0.21
0.14
0.07
0.00
CØNCENTRATIØN (PPM)
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

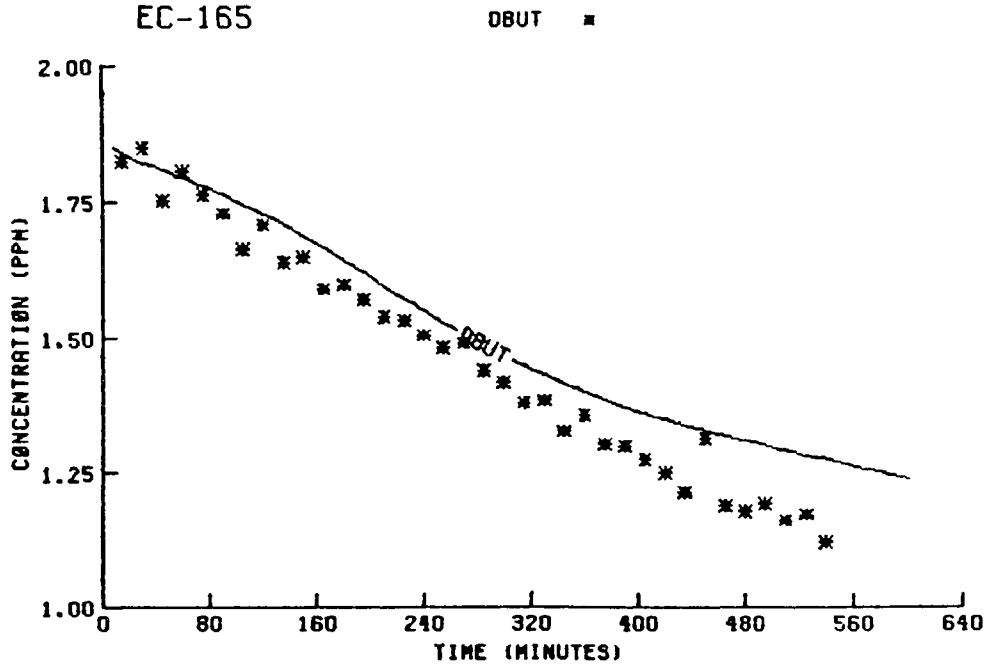

EC-157
FORM +
PAN *
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
FORM
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

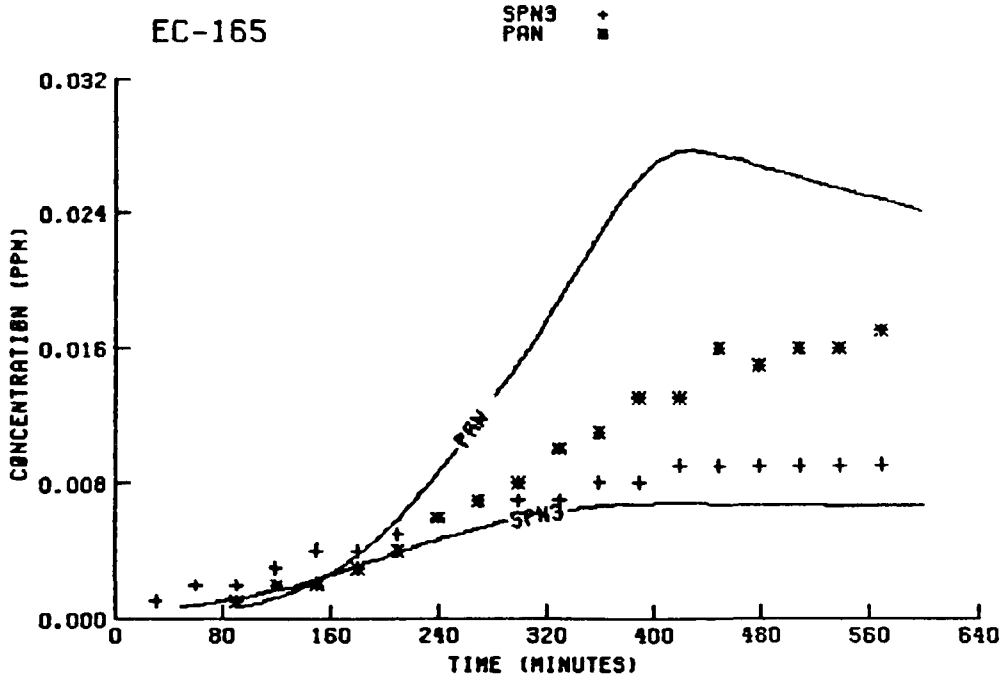

EC-157
MEN3 *
0.0028
0.0021
0.0014
0.0007
0.0000
CONCENTRATION (PPM)
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

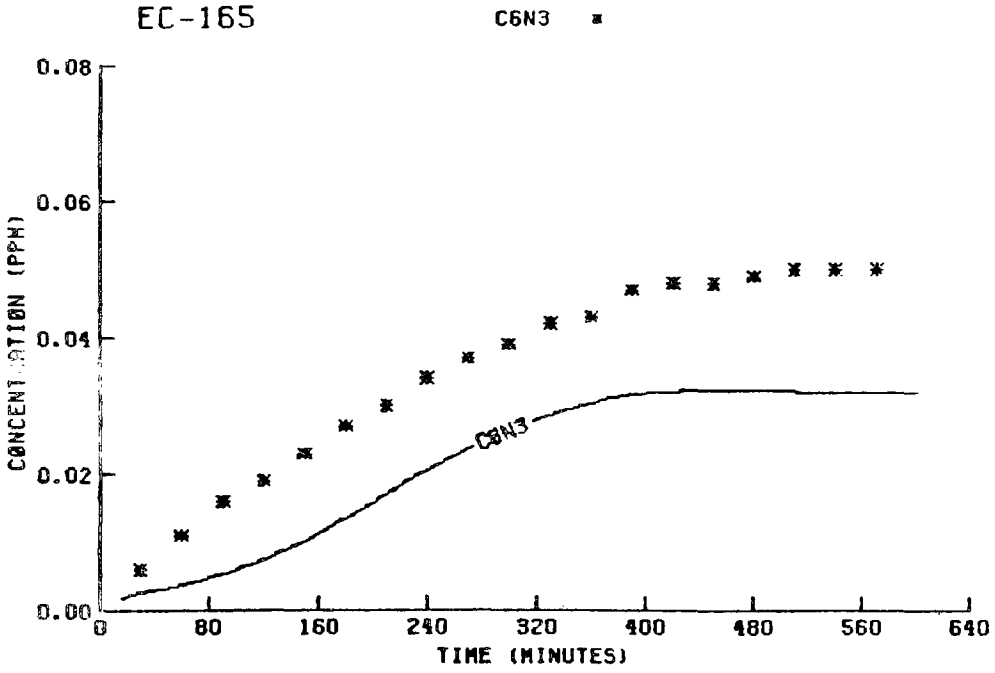
UCR 2,3-DIMETHYLBUTANE EXPERIMENTS

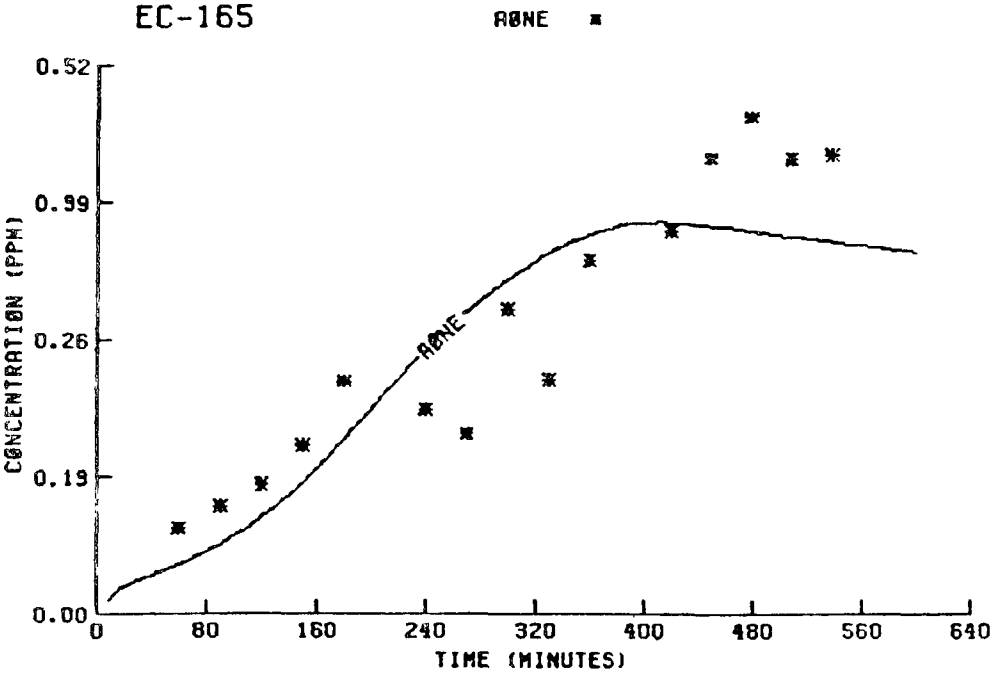

EC-165
Ø3
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
Ø3
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

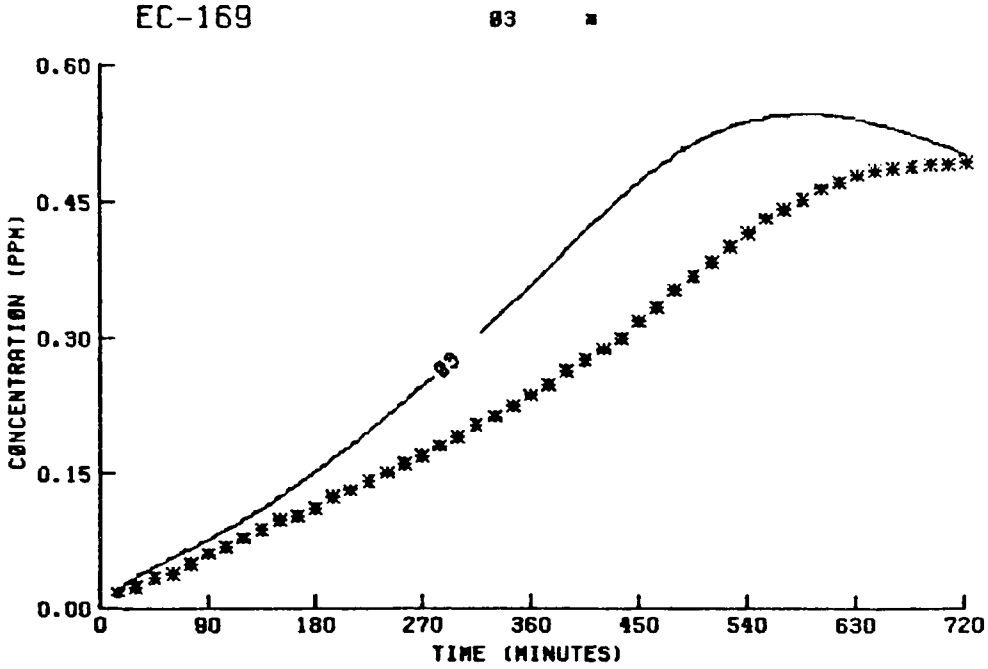

EC-165
NØ2
NØ
0.100
0.075
0.050
0.025
0.000
CØNCENTRATIØN (PPM)
NØ2
NØ
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

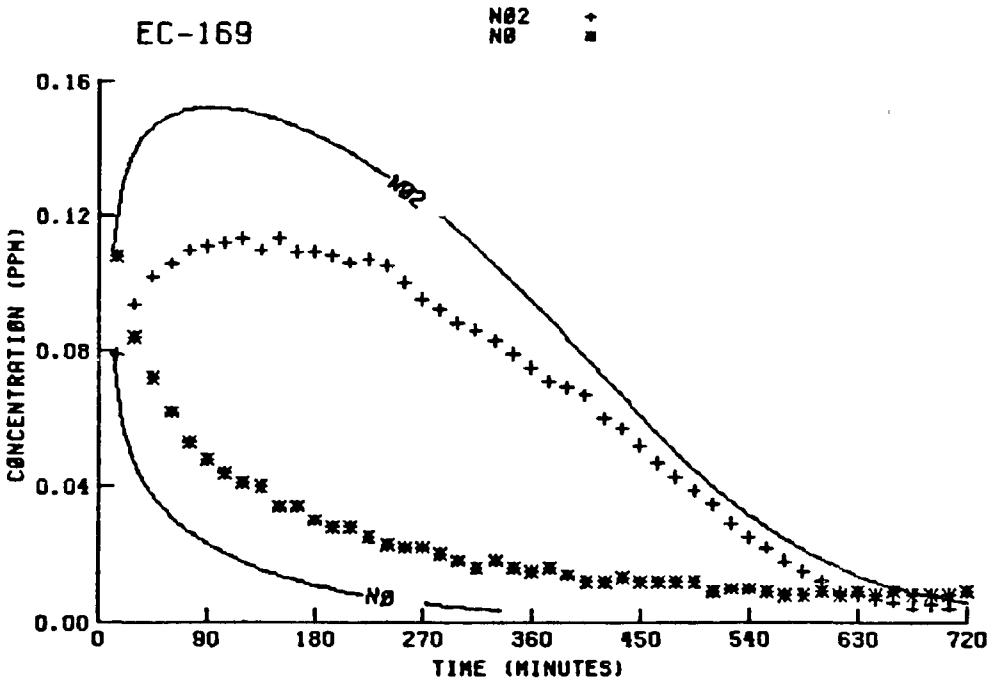

EC-165
DBUT
2.00
1.75
1.50
1.25
1.00
CONCENTRATION (PPM)
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

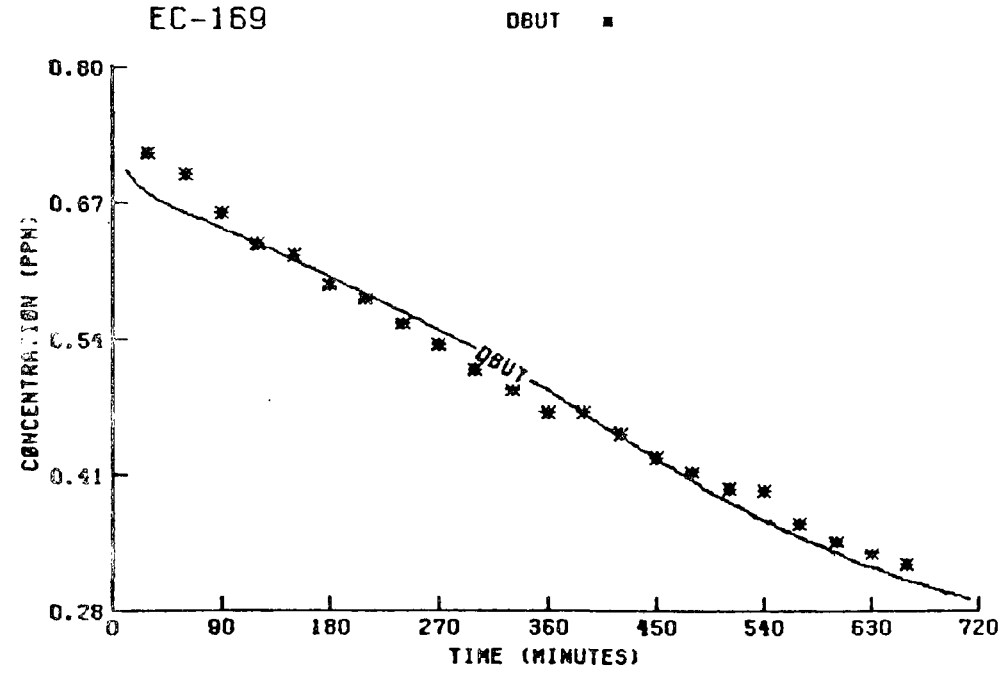

EC-165
SPN3
PAN
0.032
0.024
0.016
0.008
0.000
CONCENTRATION (PPM)
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

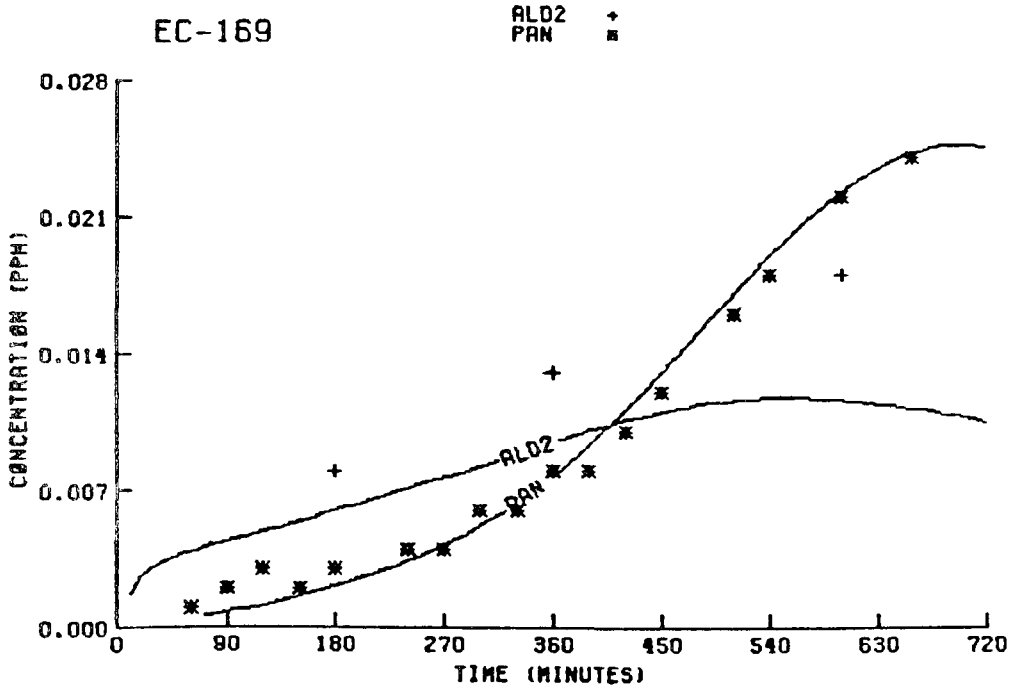

EC-165
C6N3
0.08
0.06
0.04
0.02
0.00
CONCENTRATION (PPM)
C6N3
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

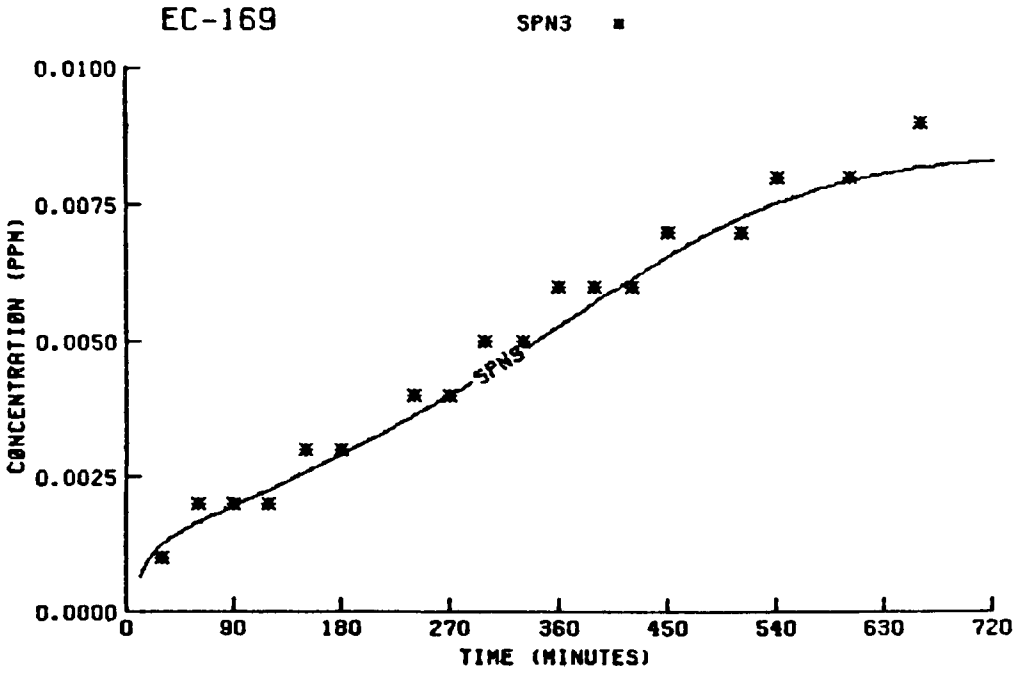

EC-165
R0NE
0.52
0.39
0.26
0.13
0.00
CONCENTRATION (PPM)
R0NE
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

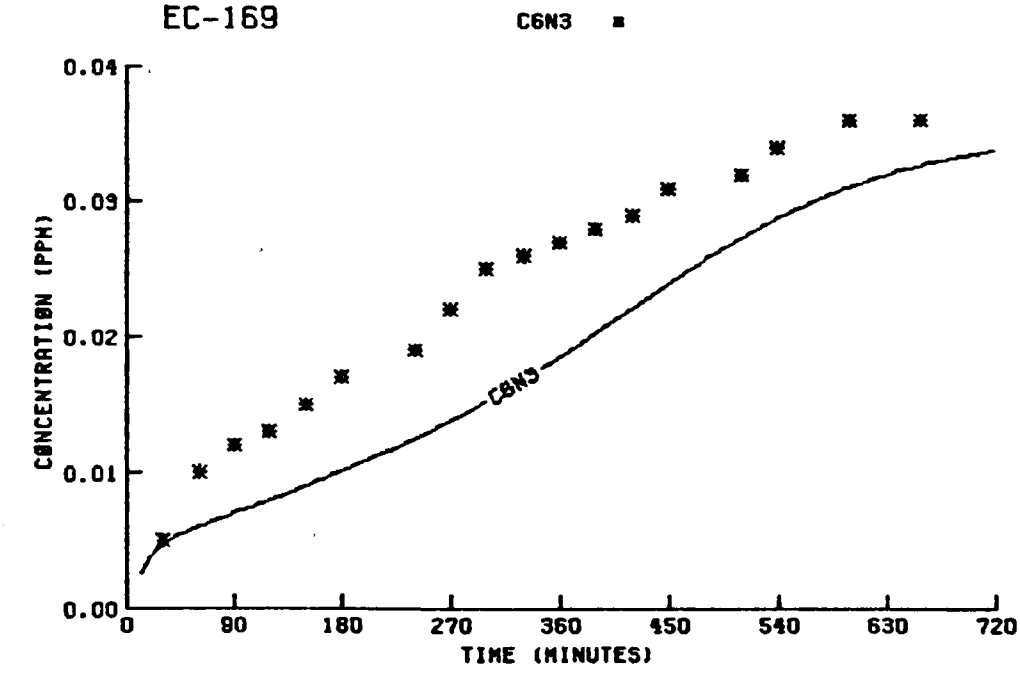

EC-169
Ø3
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
Ø3
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

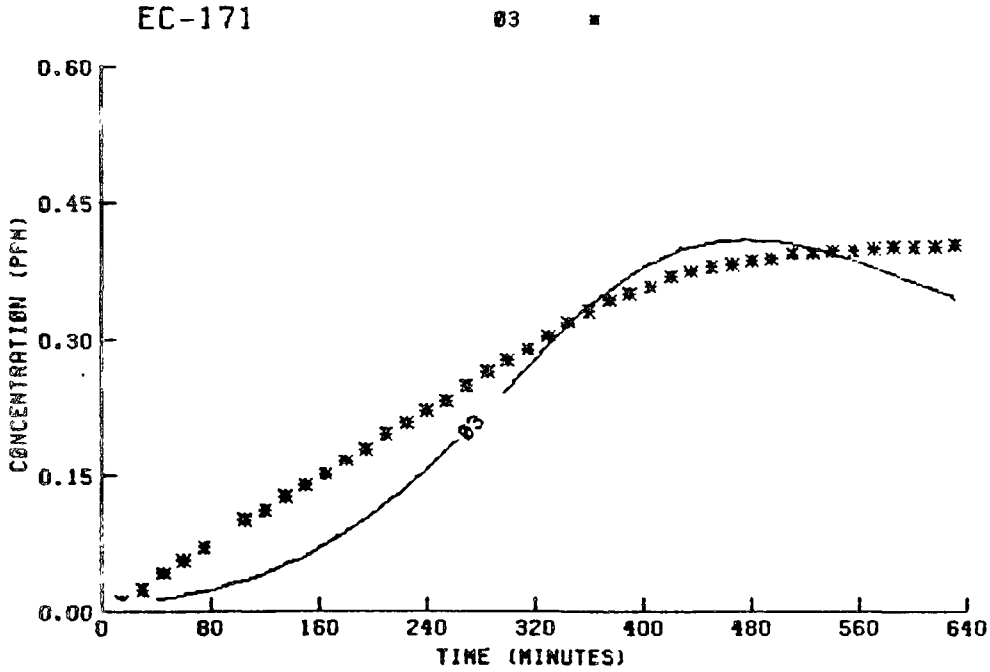

EC-169
NØ2
NØ
0.16
0.12
0.08
0.04
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

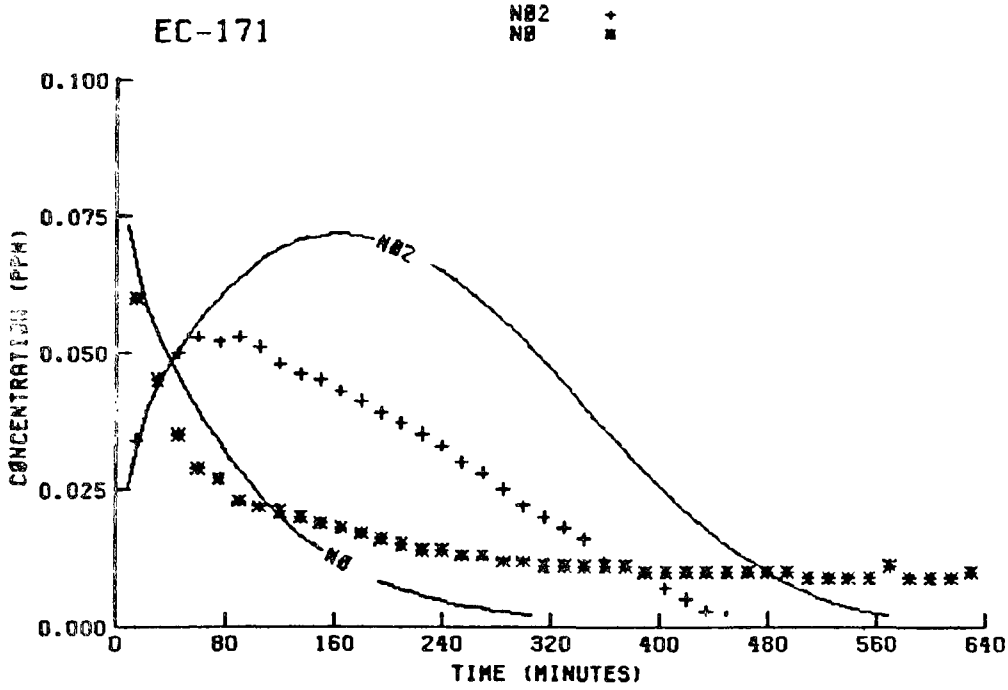

EC-169
DBUT
0.80
0.67
0.54
0.41
0.28
CONCENTRATION (PPM)
DBUT
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

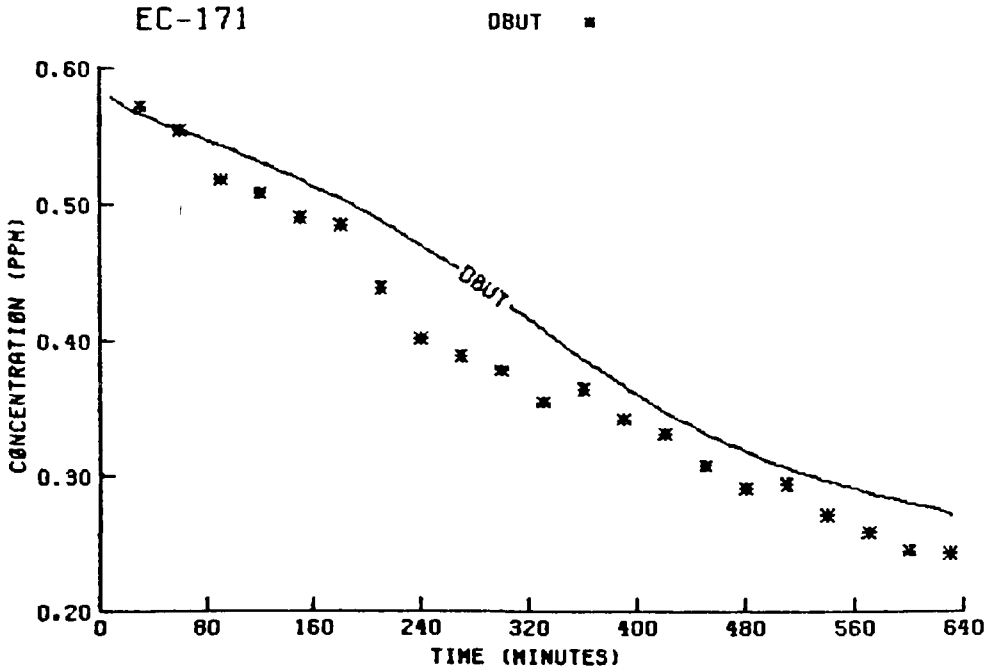

EC-169
ALD2
PAN
0.028
0.021
0.014
0.007
0.000
CONCENTRATION (PPM)
ALD2
PAN
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

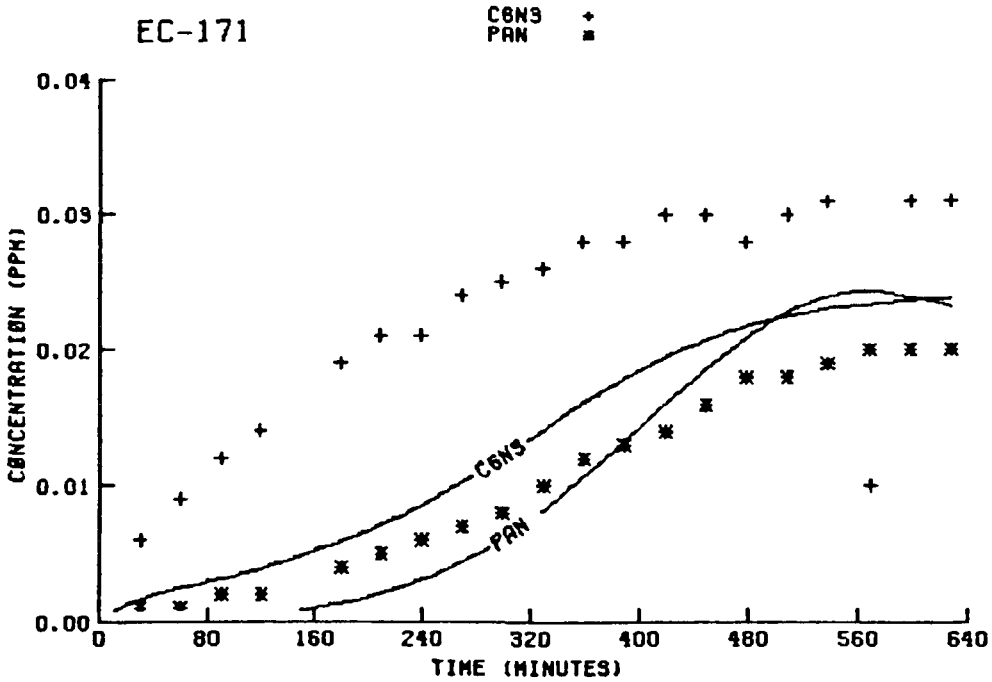

EC-169
SPN3
0.0100
0.0075
0.0050
0.0025
0.0000
CONCENTRATION (PPM)
SPN3
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

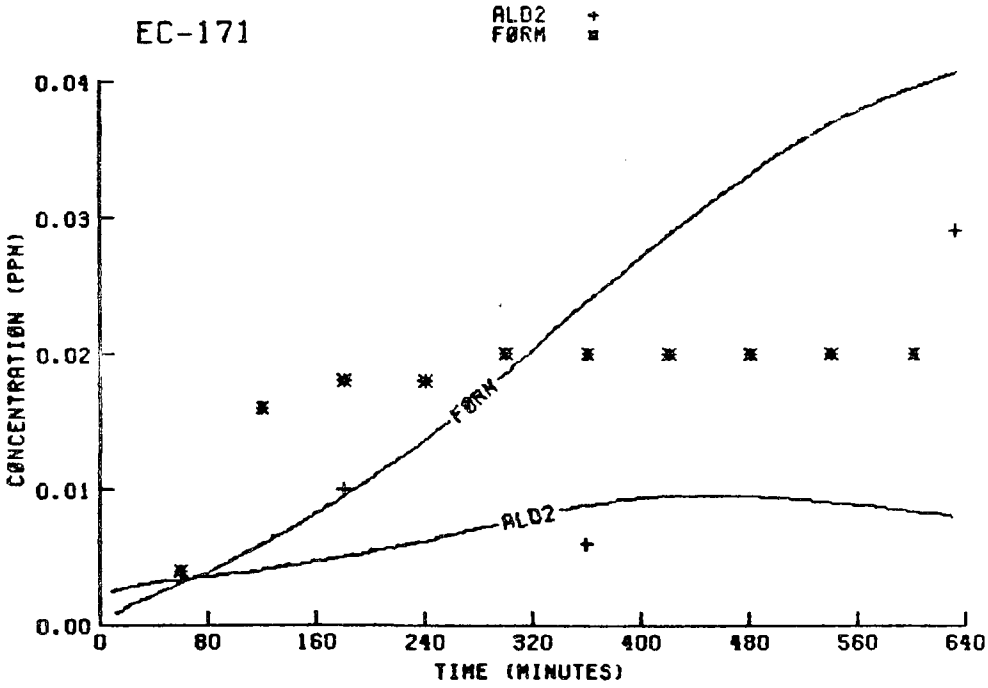

EC-169
C6N3
0.04
0.03
0.02
0.01
0.00
CONCENTRATION (PPM)
C6N3
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

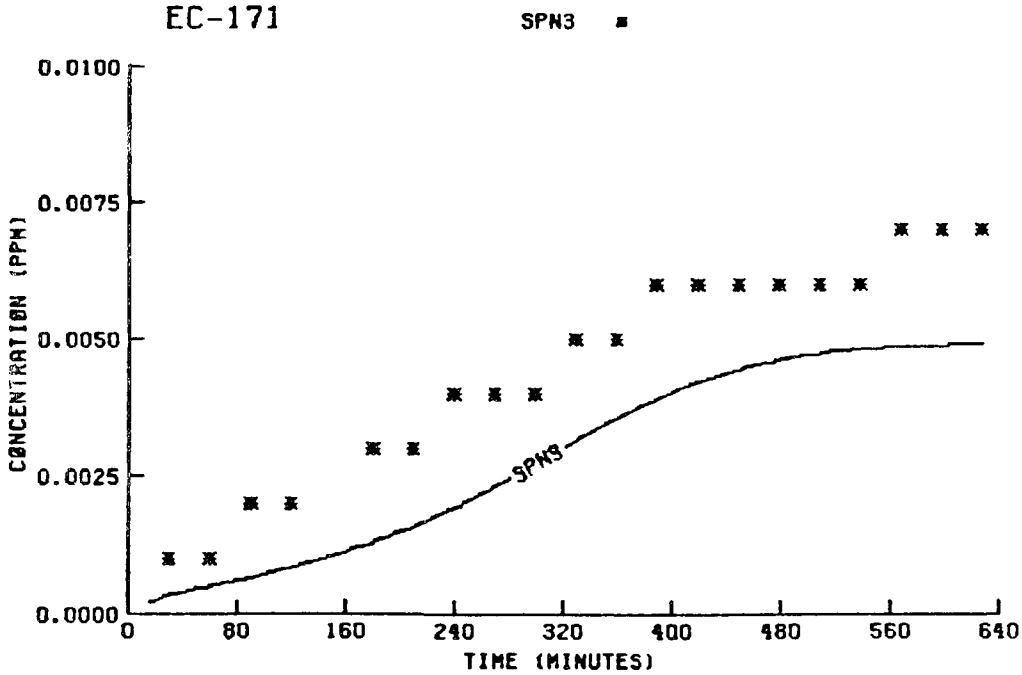

EC-171
Ø3 *
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
Ø3
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

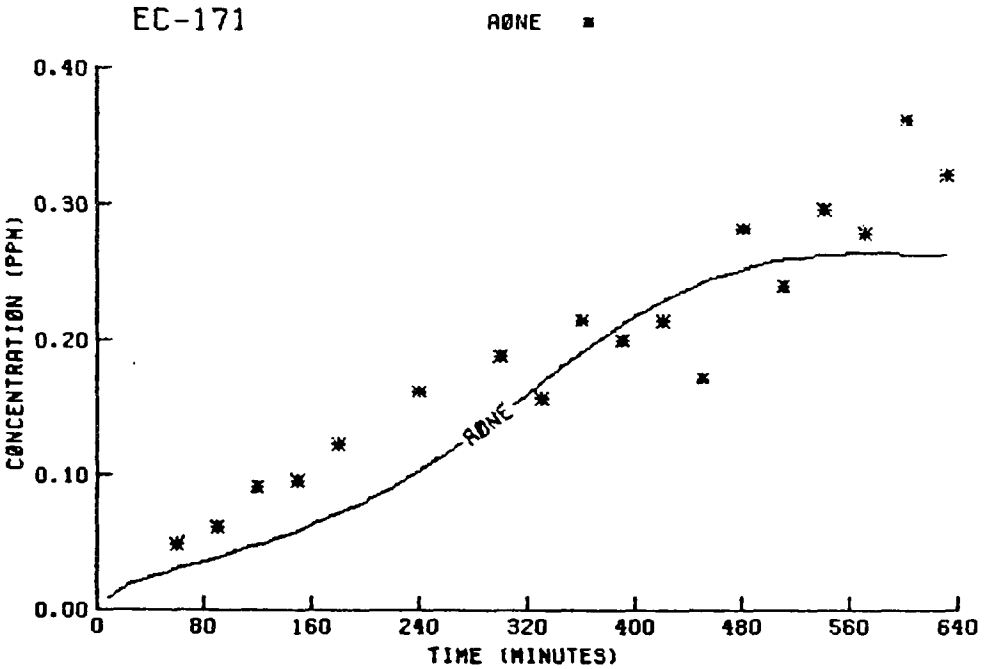

EC-171
NØ2 +
NØ *
0.100
0.075
0.050
0.025
0.000
CØNCENTRATIØN (PPM)
NØ2
NØ
0
80
160
240
320
400
480
560
640
TIME (MINUTES)


EC-171
OBUT
0.60
0.50
0.40
0.30
0.20
CONCENTRATION (PPM)
OBUT
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

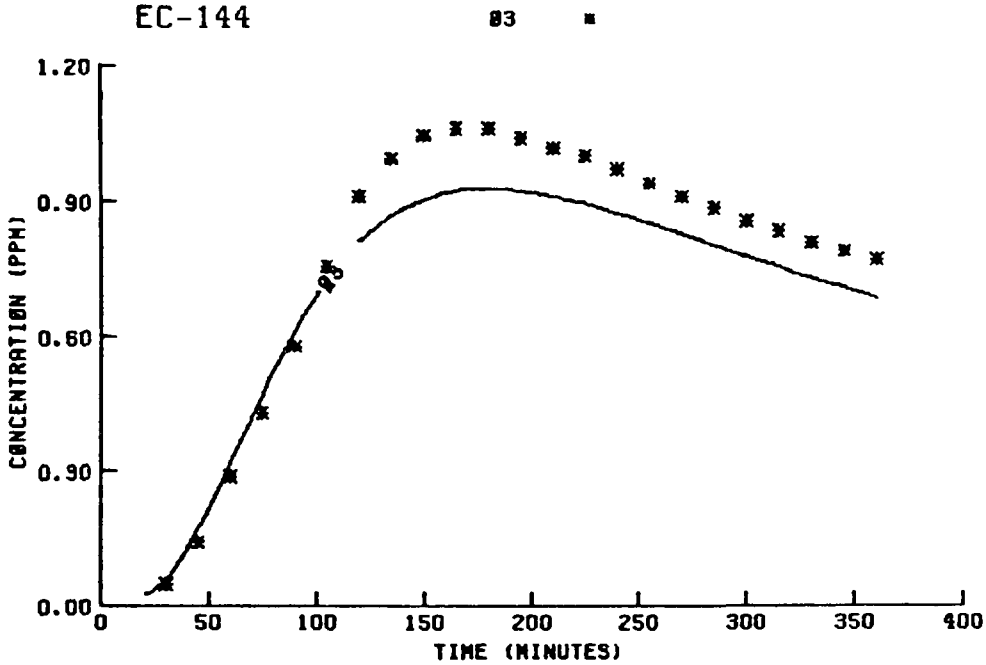

EC-171
C6N3
PAN
0.04
0.03
0.02
0.01
0.00
CONCENTRATION (PPM)
C6N3
PAN
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

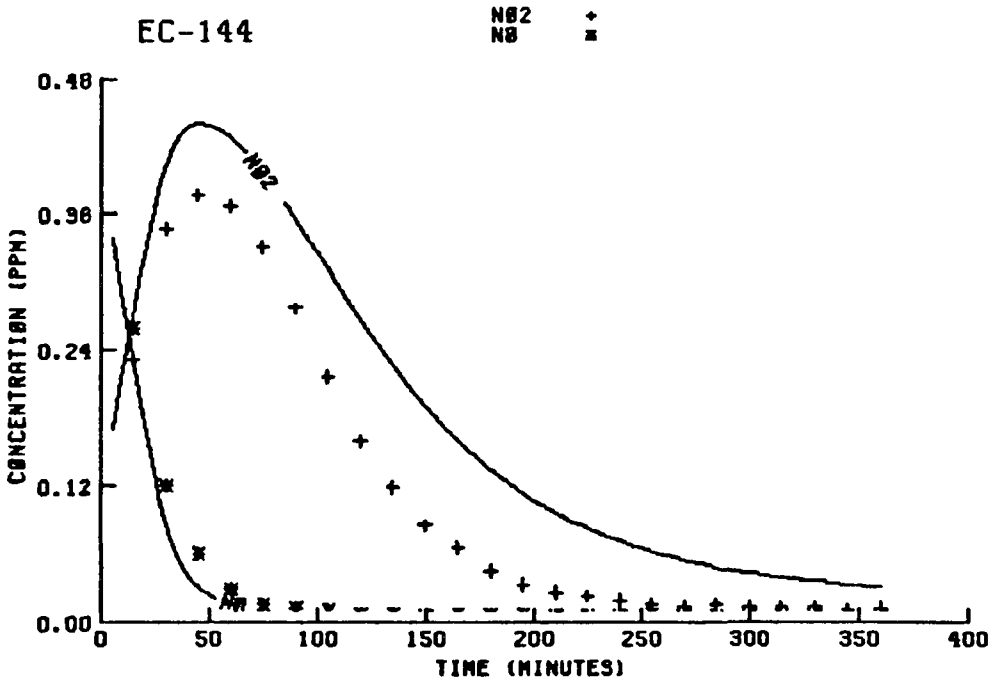

EC-171
ALD2 +
FØRM ∗
0.04
0.03
0.02
0.01
0.00
CØNCENTRATIØN (PPM)
FØRM
ALD2
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

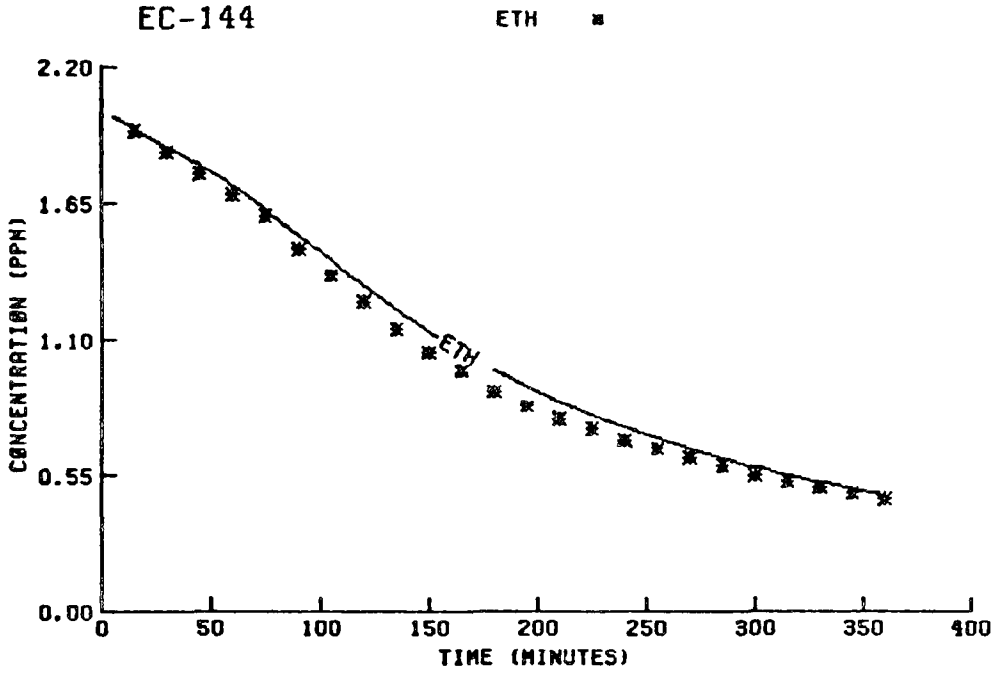

EC-171
SPN3 ∗
0.0100
0.0075
0.0050
0.0025
0.0000
CØNCENTRATIØN (PPM)
SPN3
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

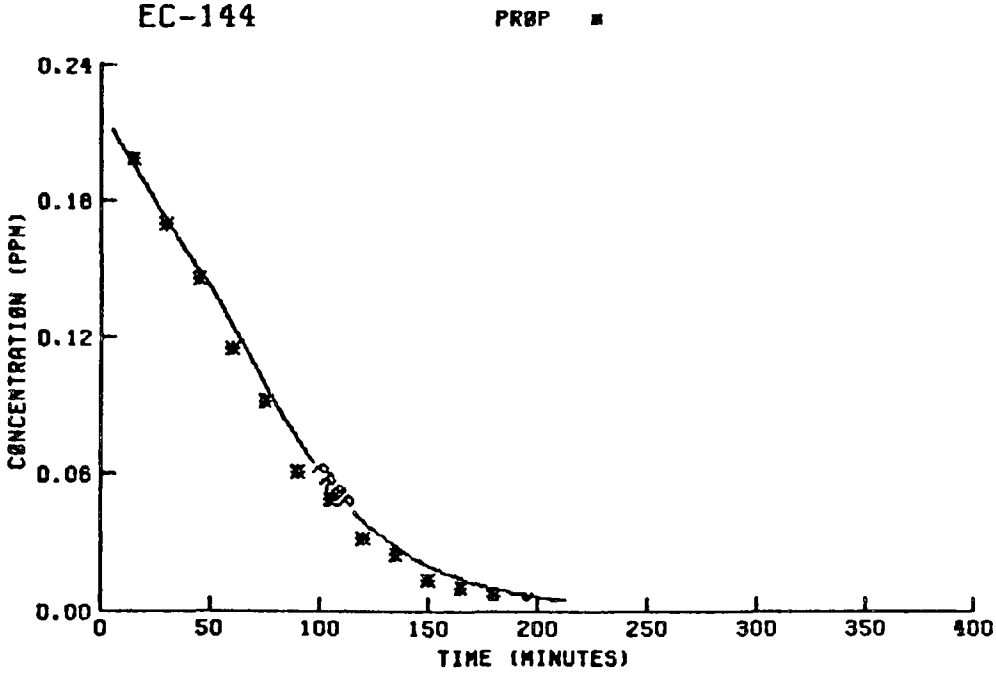

EC-171
AØNE
0.40
0.30
0.20
0.10
0.00
CØNCENTRATIØN (PPM)
AØNE
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

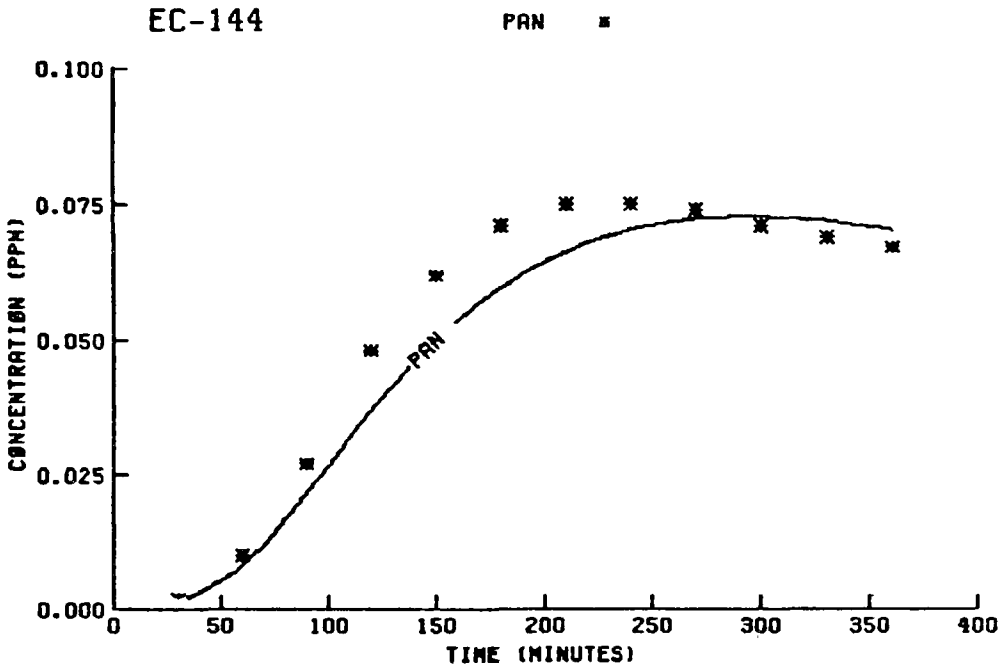
UCR ETHYLENE/PROPYLENE EXPERIMENTS

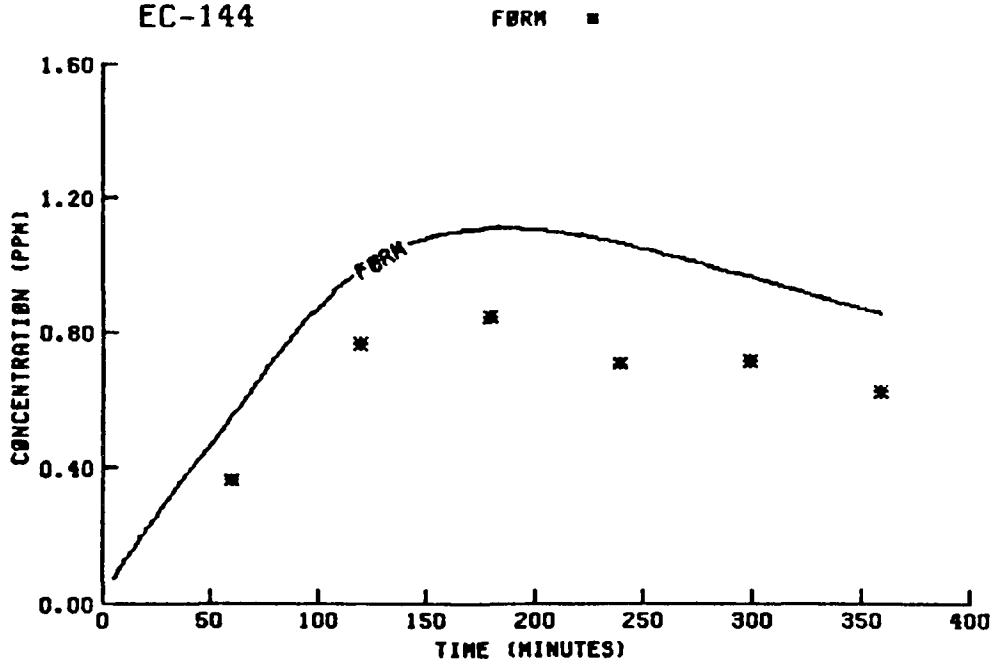

EC-144
03
1.20
0.90
0.60
0.30
0.00
CONCENTRATION (PPM)
03
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

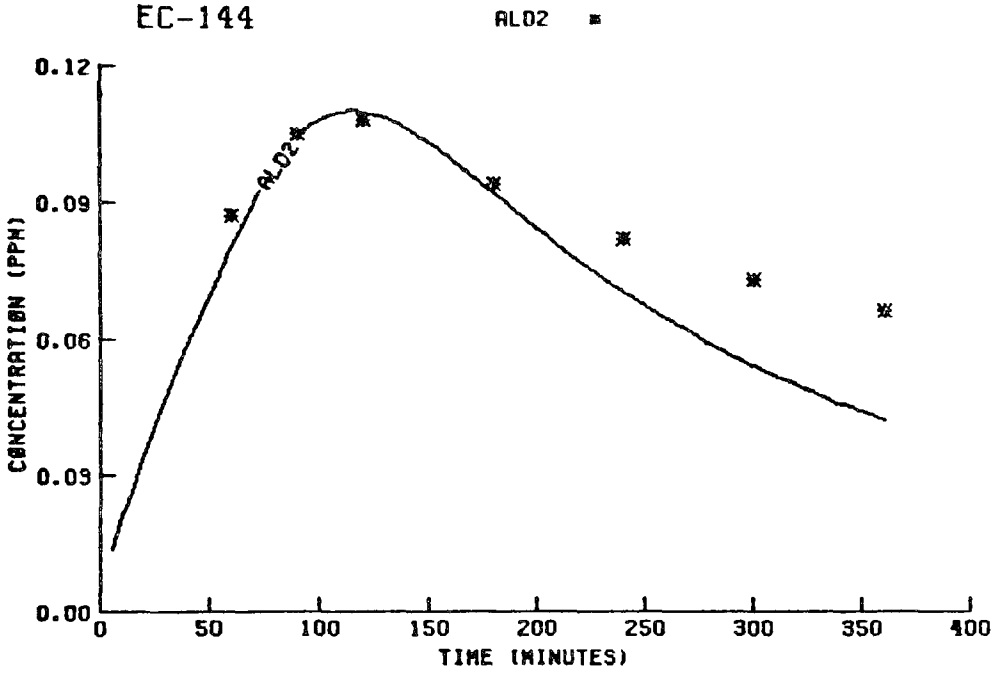

EC-144
NO2
NO
0.48
0.36
0.24
0.12
0.00
CONCENTRATION (PPM)
NO2
NO
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

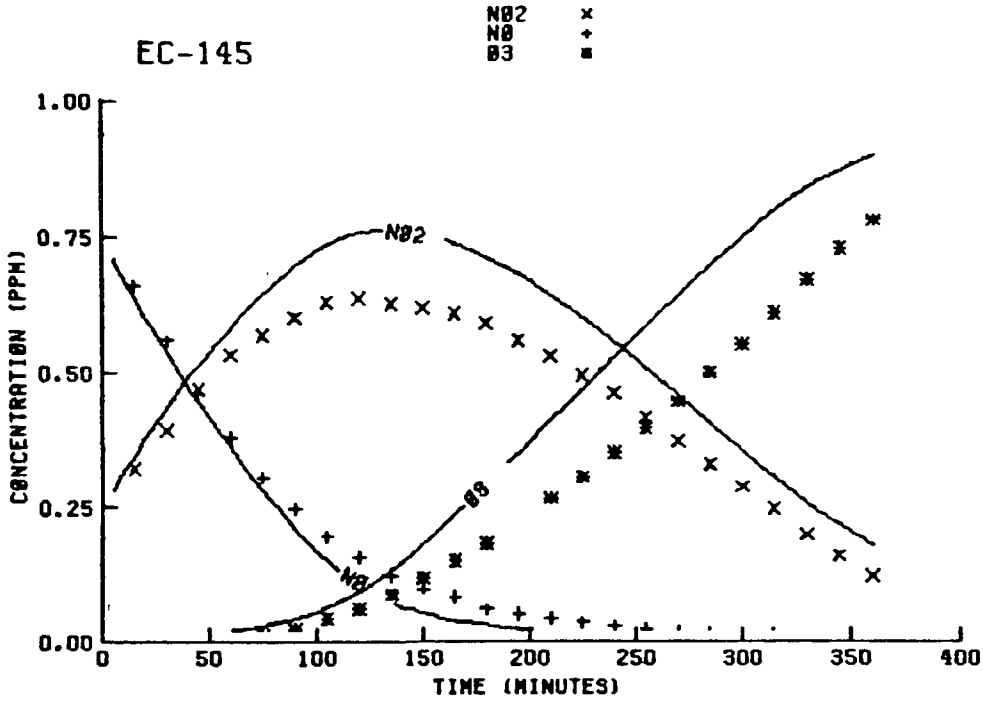

EC-144
ETH
2.20
1.65
1.10
0.55
0.00
CONCENTRATION (PPM)
ETH
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

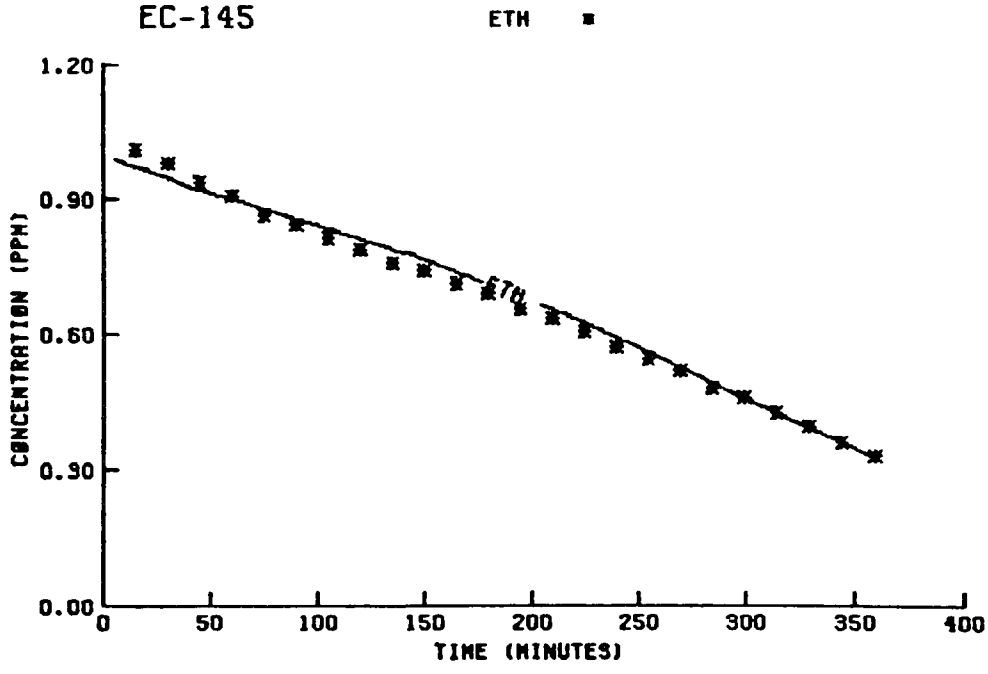

EC-144
PROP
0.24
0.18
0.12
0.06
0.00
CONCENTRATION (PPM)
PROP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

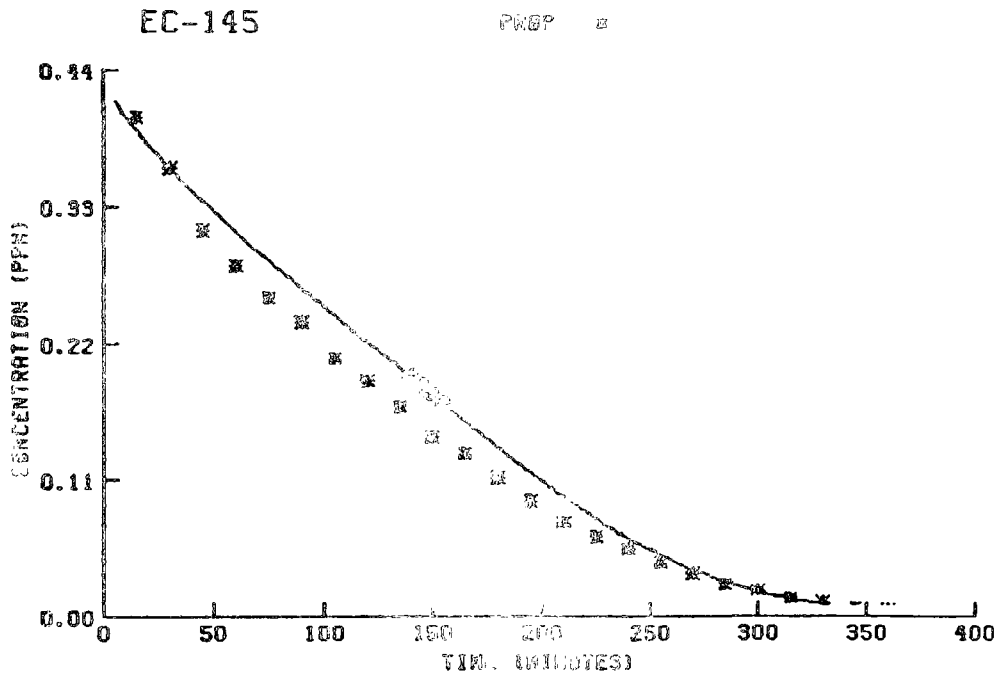

EC-144
PAN
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

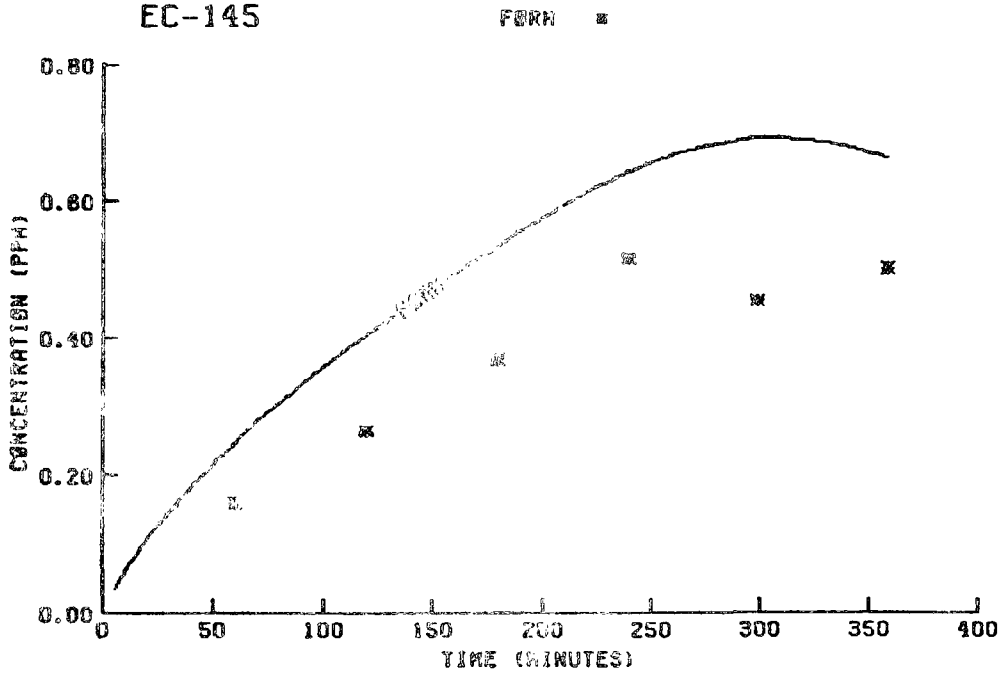

EC-144
FORM
1.60
1.20
0.80
0.40
0.00
CONCENTRATION (PPM)
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

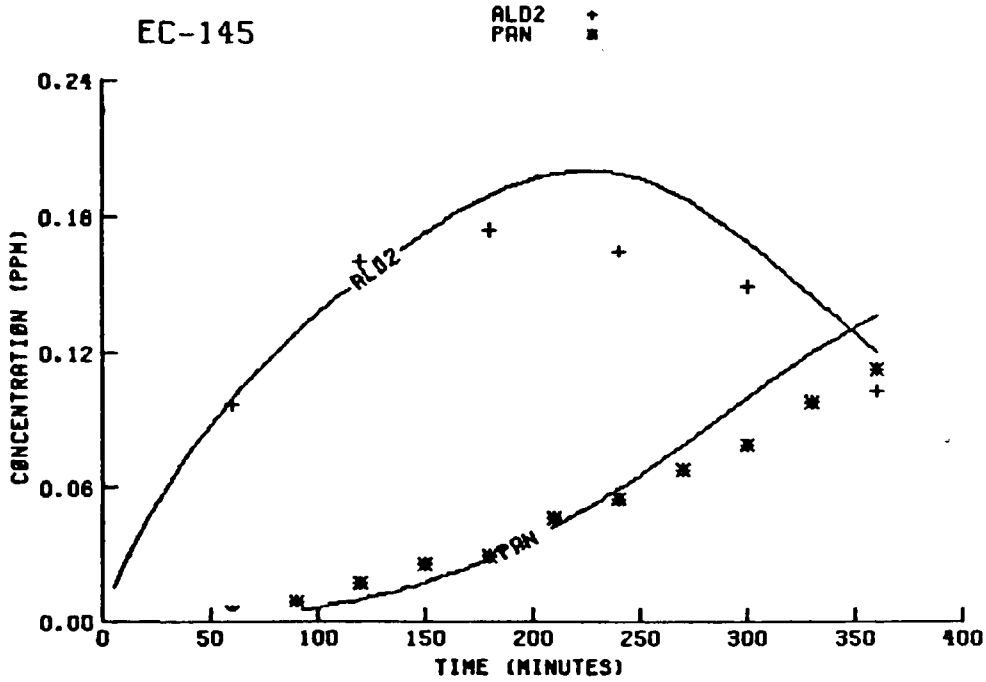

EC-144
ALD2
0.12
0.09
0.06
0.03
0.00
CONCENTRATION (PPM)
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

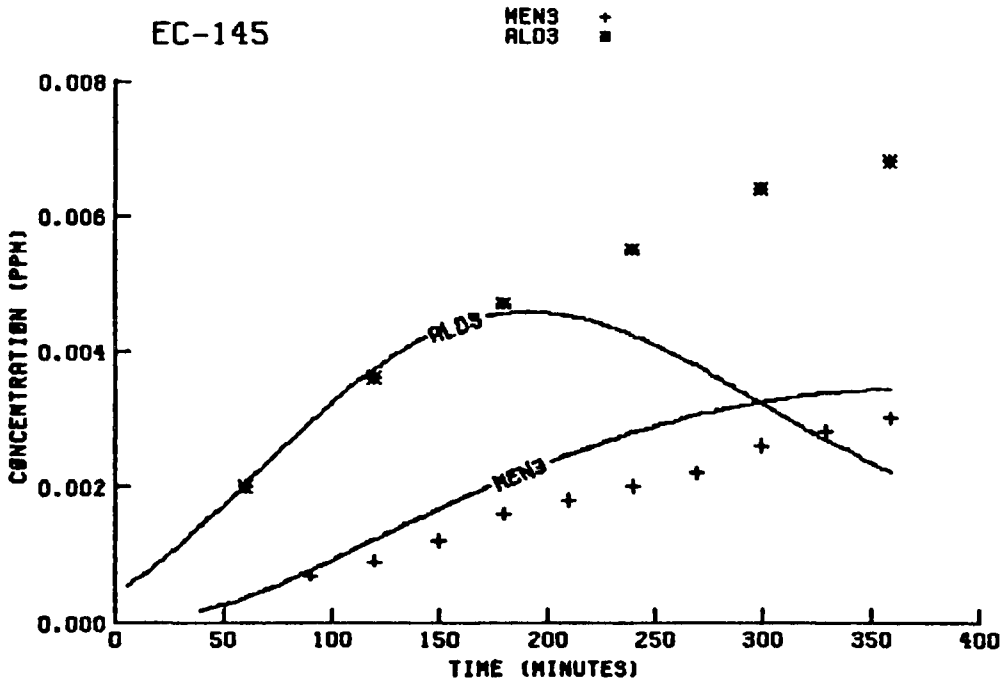

EC-145
NØ2
NØ
Ø3
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPH)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

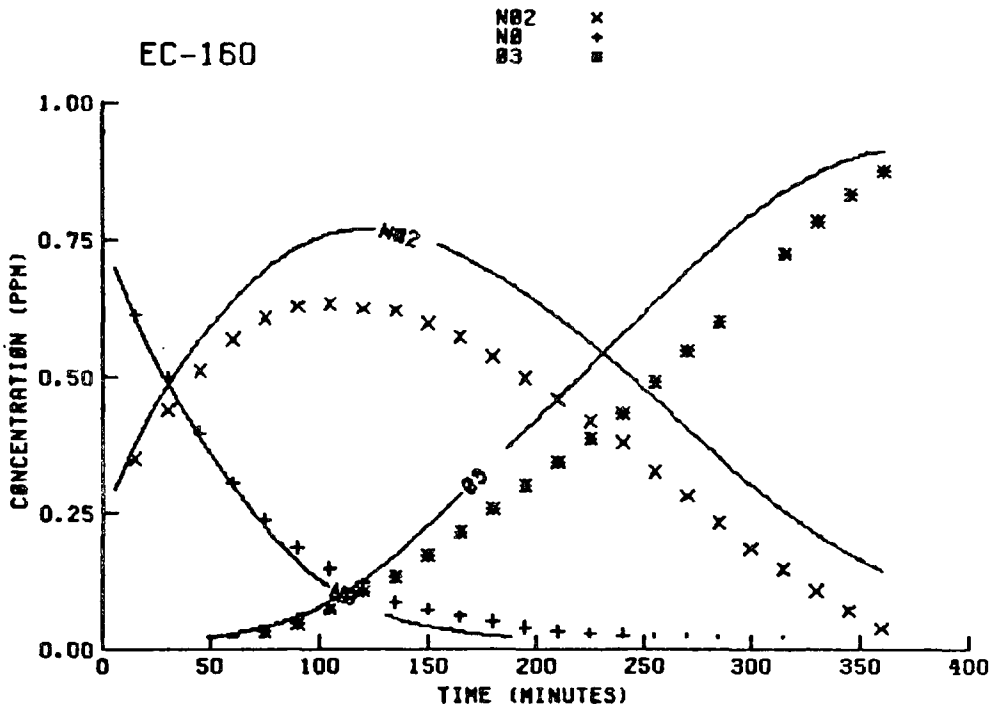

EC-145
ETH
1.20
0.90
0.60
0.30
0.00
CØNCENTRATIØN (PPH)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

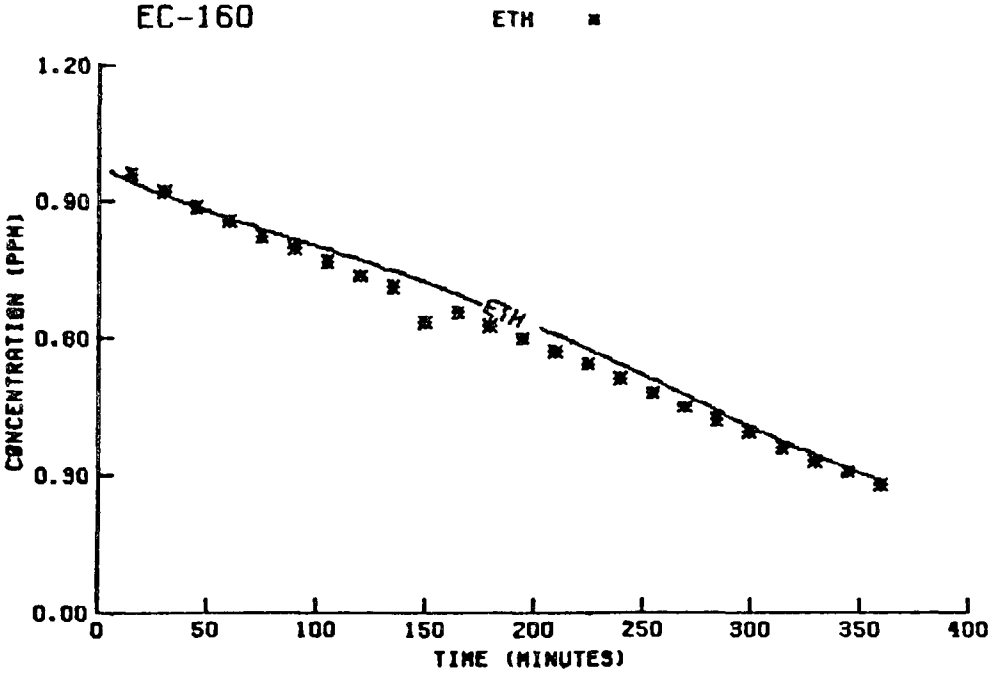

EC-145
PROP
0.44
0.33
0.22
0.11
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400

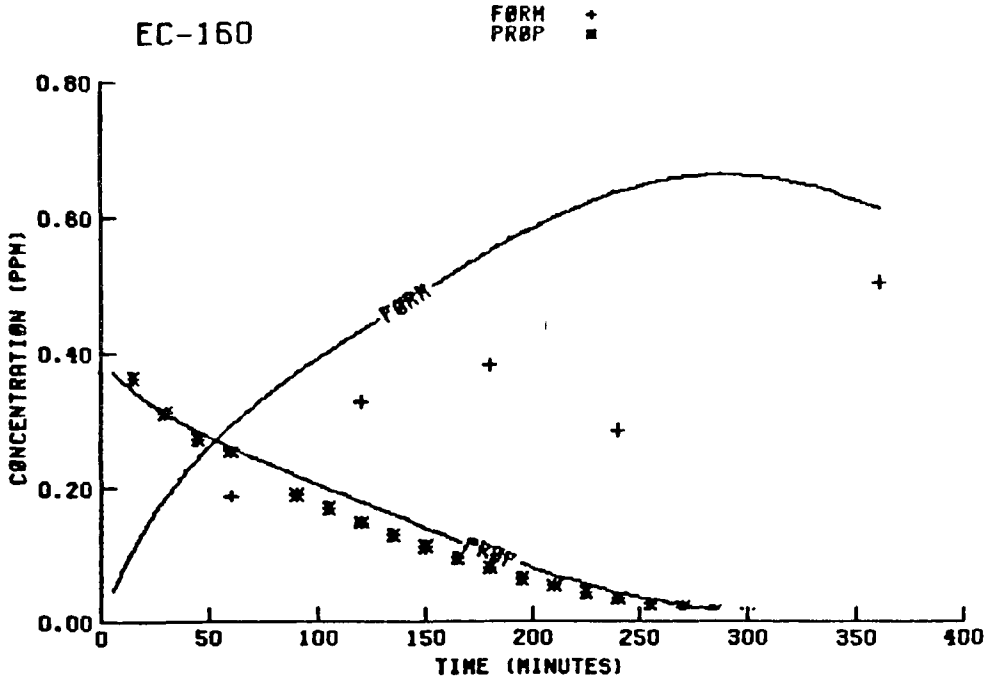

EC-145
FORM
0.80
0.60
0.40
0.20
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

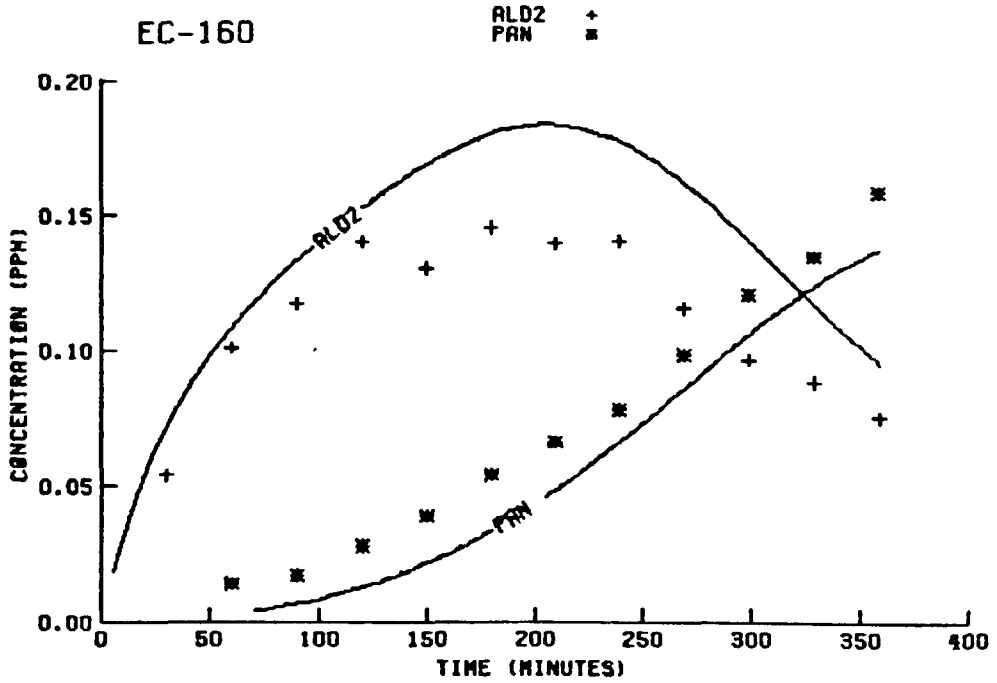

EC-145
ALD2 +
PAN ■
0.24
0.18
0.12
0.06
0.00
CONCENTRATION (PPM)
ALD2
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

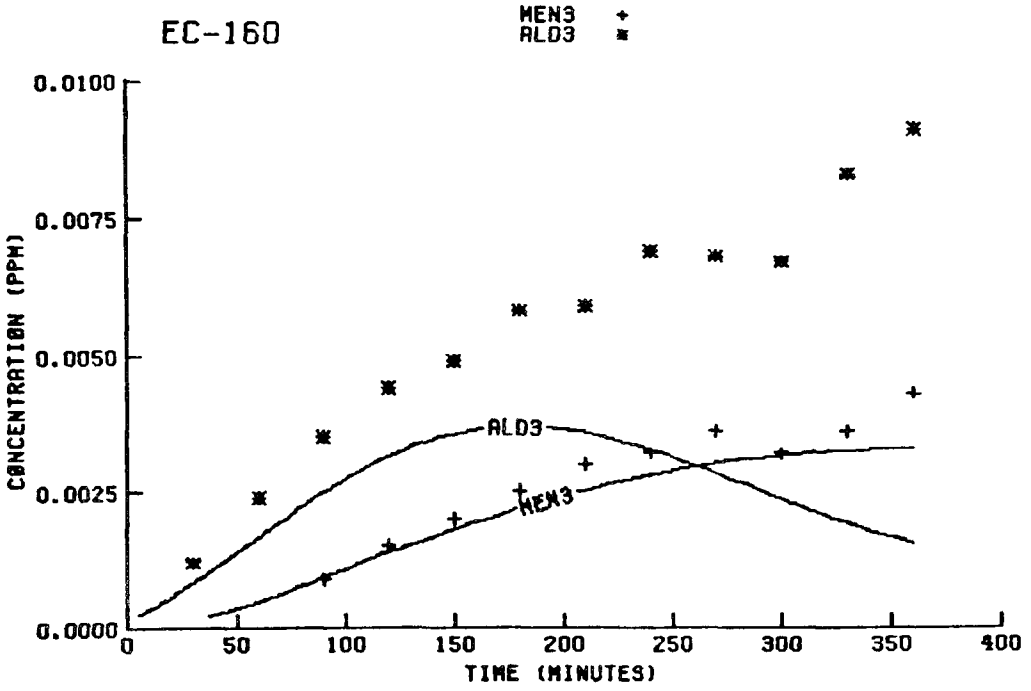

EC-145
MEN3 +
ALD3 ■
0.008
0.006
0.004
0.002
0.000
CONCENTRATION (PPM)
ALD5
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-160
NØ2
NØ
Ø3
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

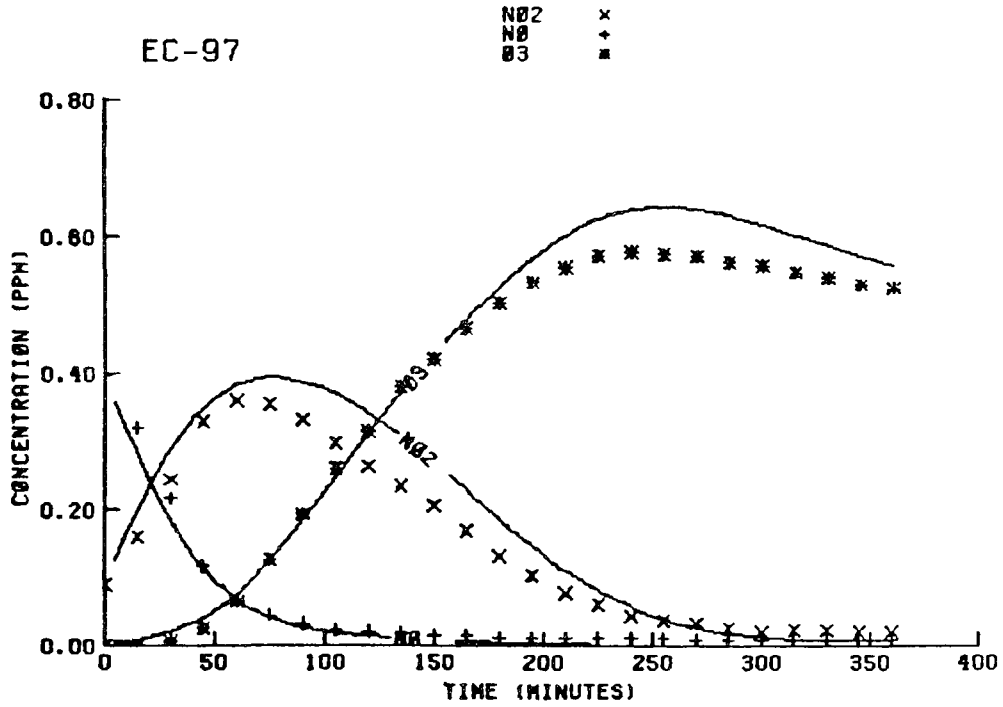

EC-160
ETH
1.20
0.90
0.60
0.90
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

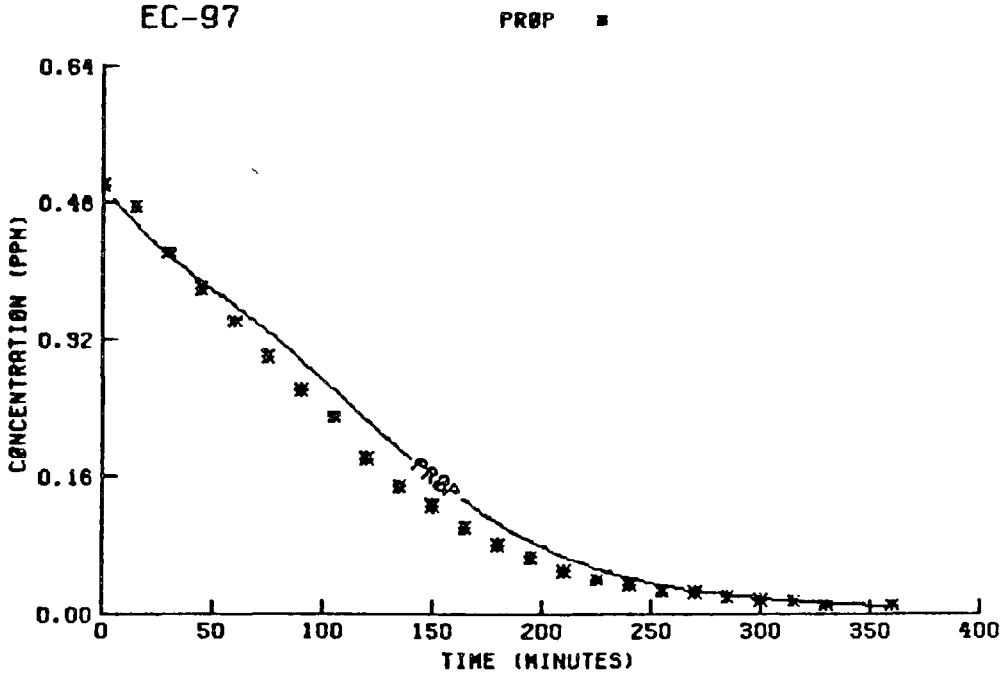

EC-160
FØRM
PRØP
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
FØRM
PRØP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

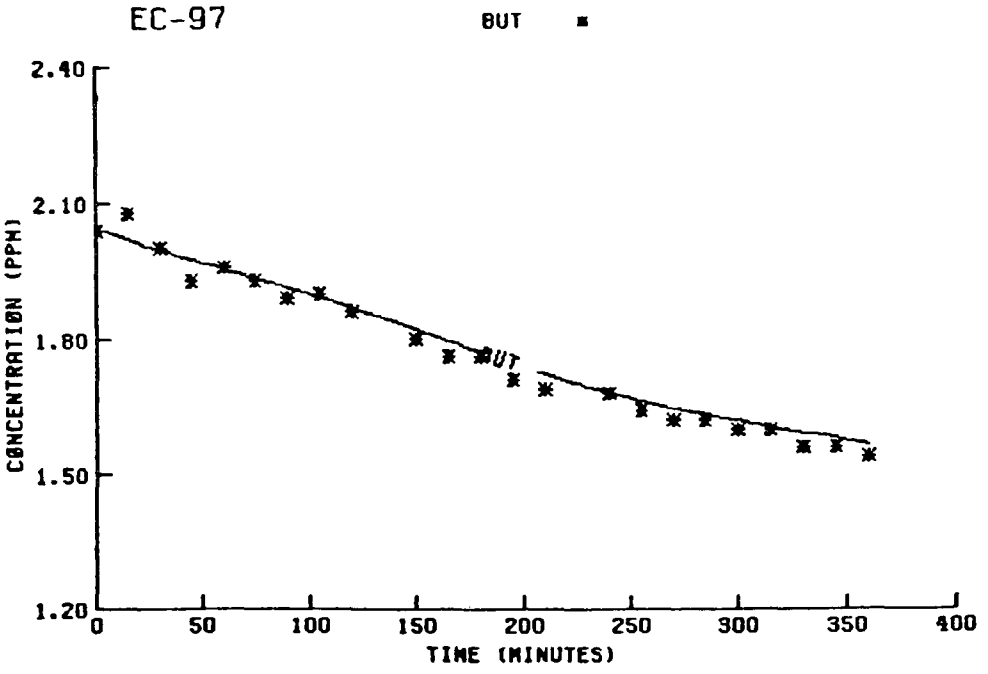

EC-160
ALD2
PAN
0.20
0.15
0.10
0.05
0.00
CØNCENTRATIØN (PPM)
ALD2
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

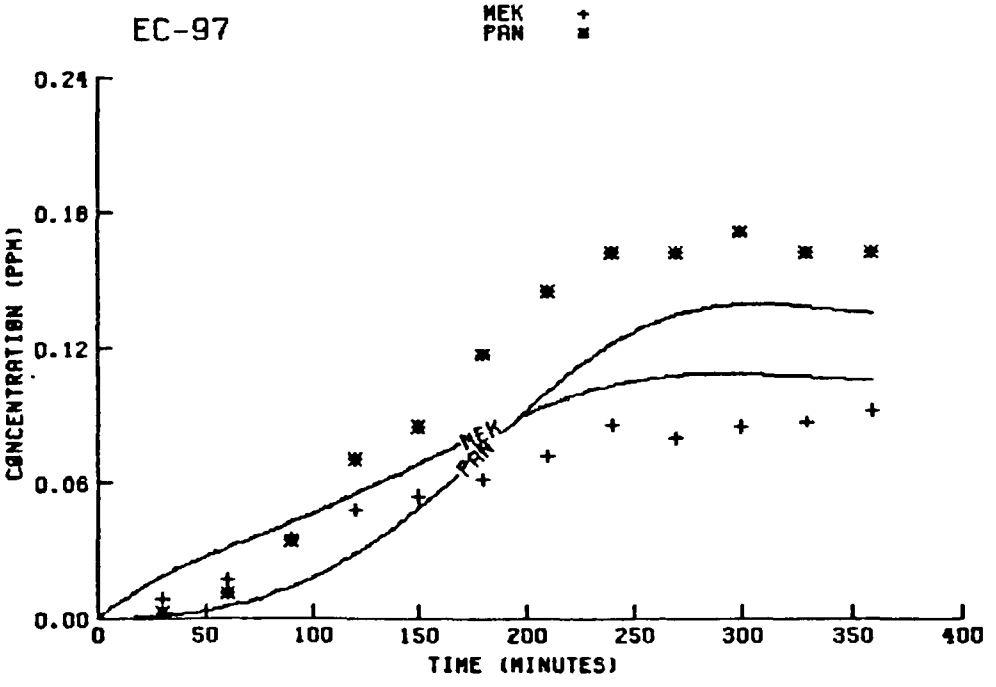

EC-160
MEN3
ALD3
0.0100
0.0075
0.0050
0.0025
0.0000
CONCENTRATION (PPM)
ALD3
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

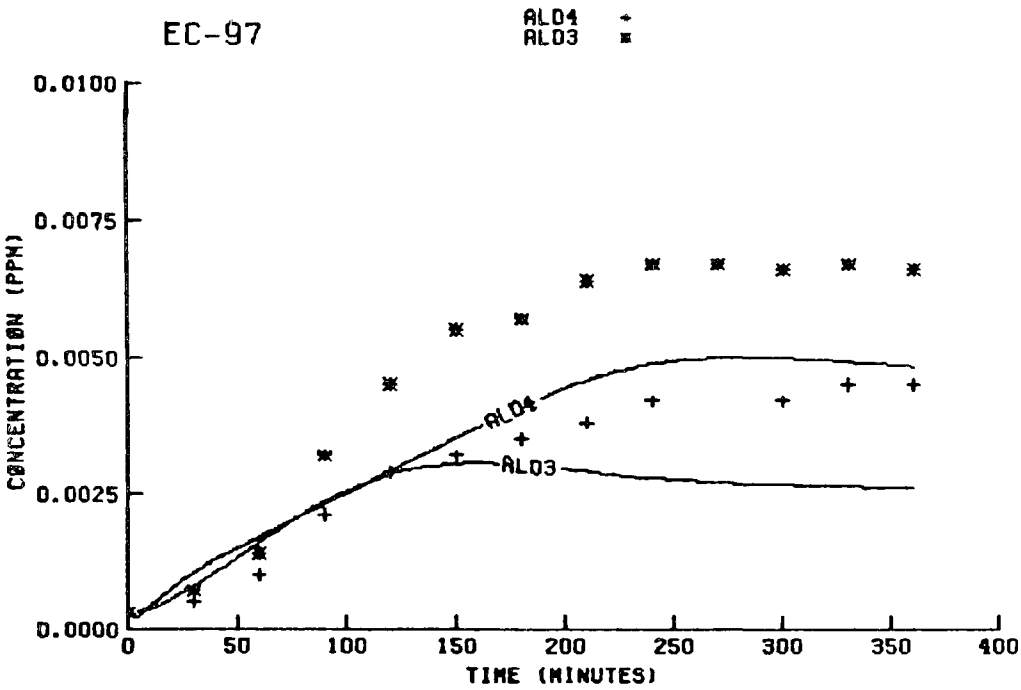
UCR PROPYLENE/BUTANE EXPERIMENTS

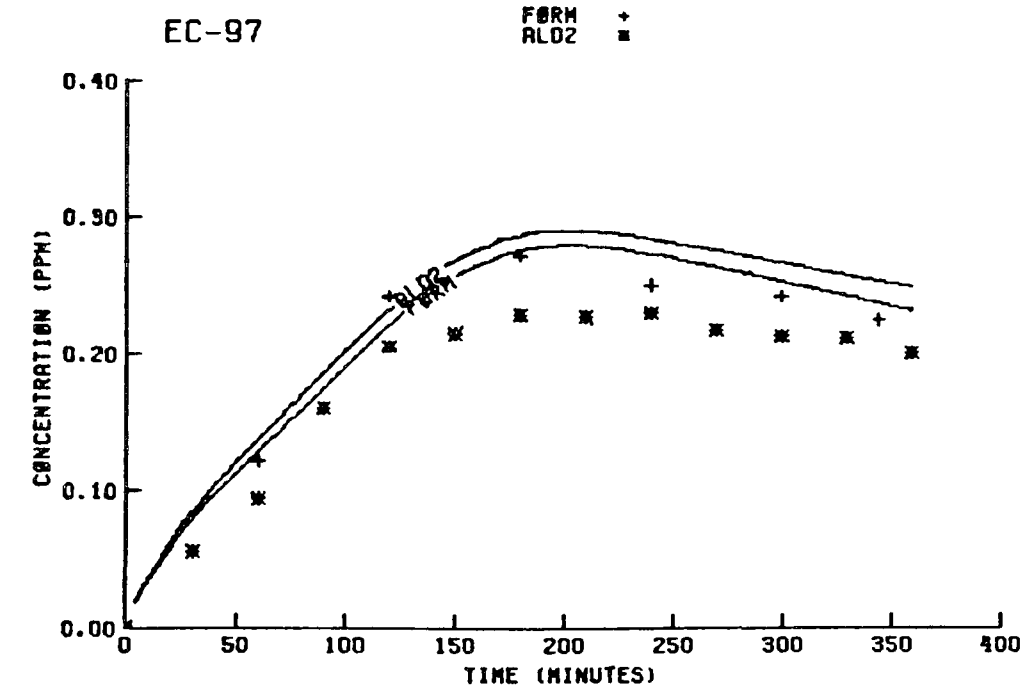

EC-97
NØ2 ×
NØ +
Ø3 ■
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
Ø3
NØ2
NØ

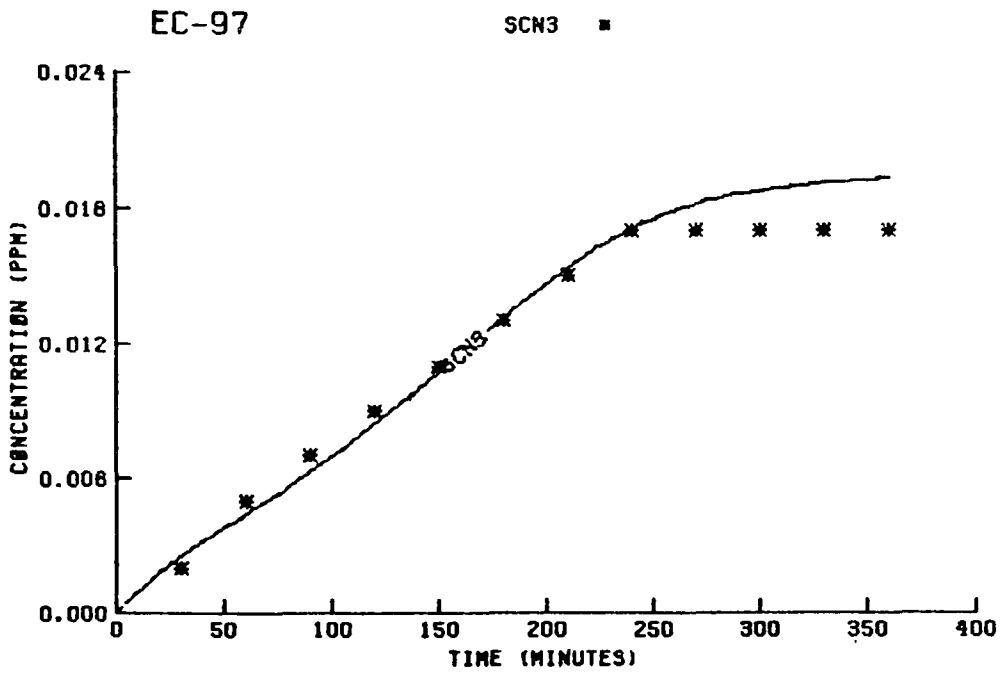

EC-97
PRØP ■
0.64
0.48
0.32
0.16
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
PRØP

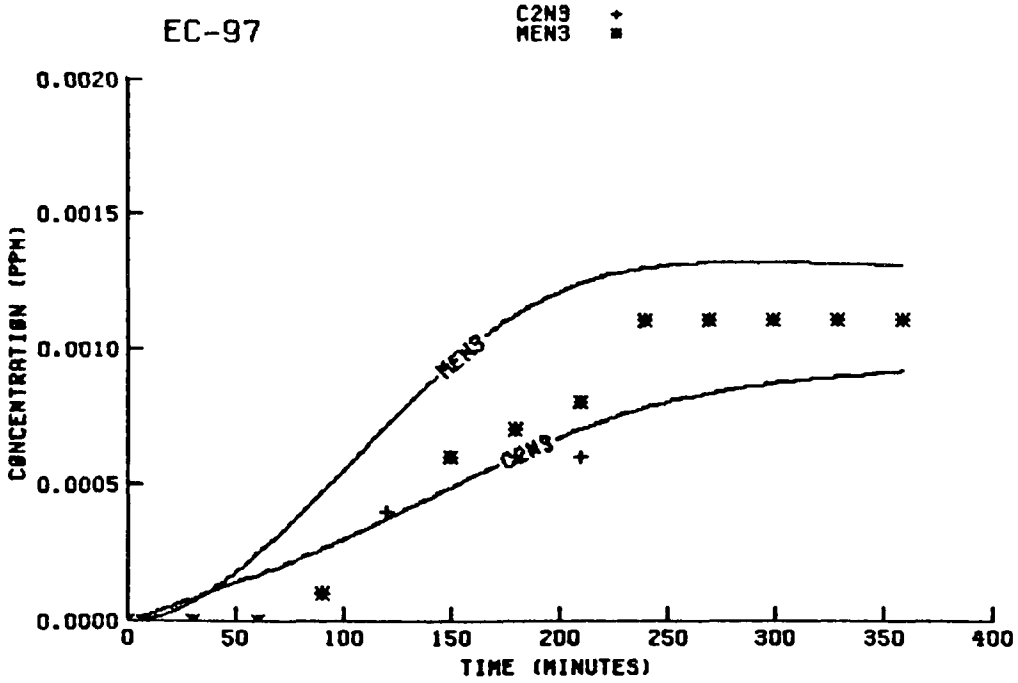

EC-97
BUT
2.40
2.10
1.80
1.50
1.20
CONCENTRATION (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

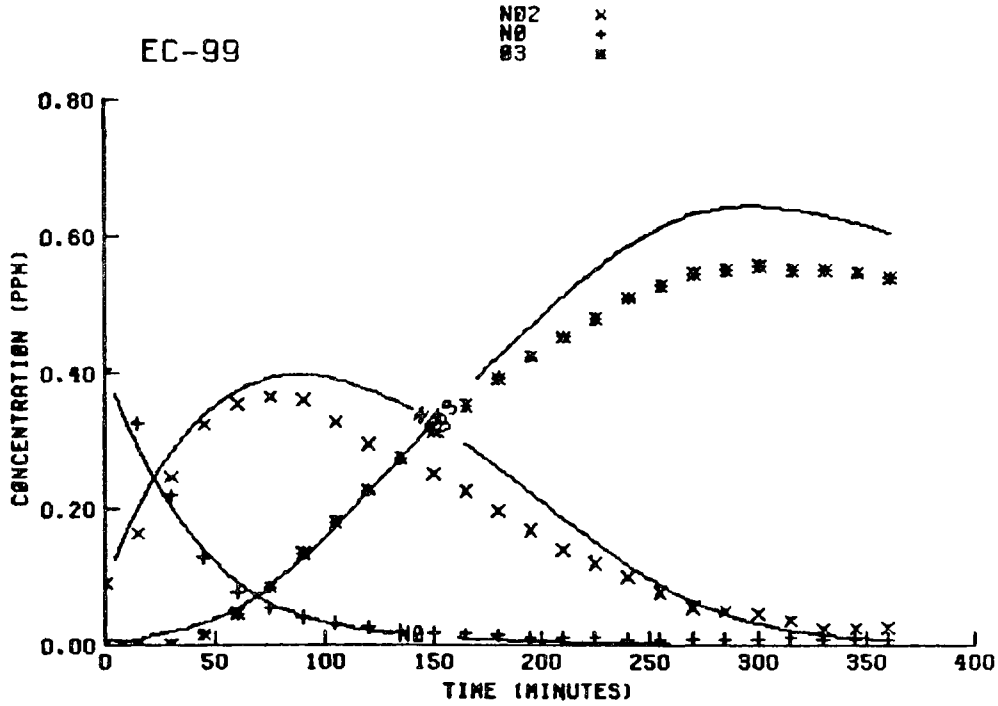

EC-97
MEK
PAN
0.24
0.18
0.12
0.06
0.00
CONCENTRATION (PPM)
MEK
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

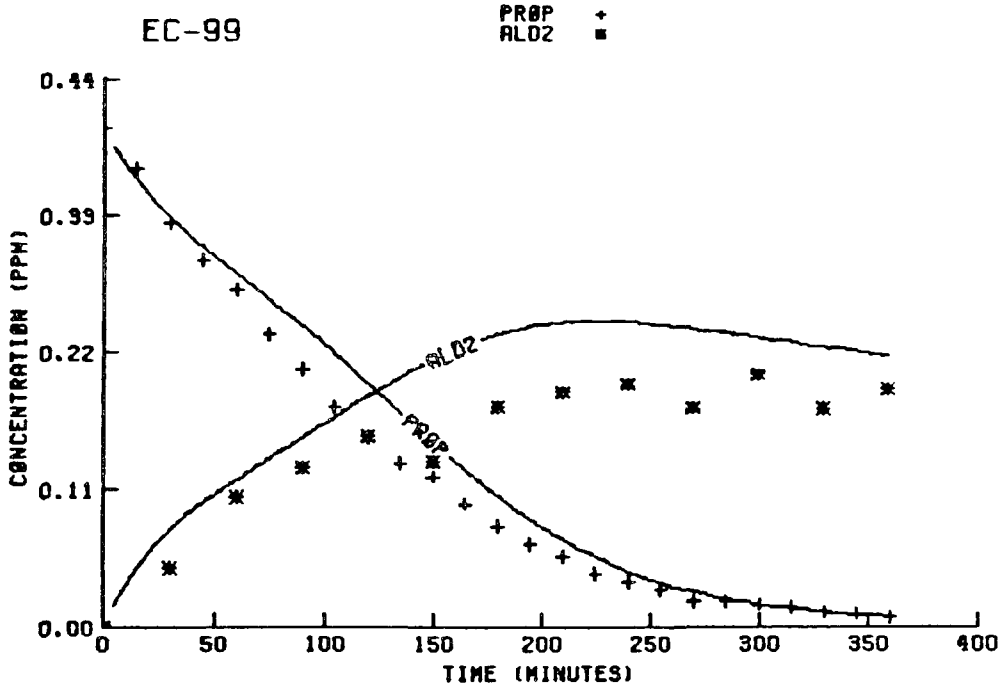

EC-97
ALD4 +
ALD3 ■
0.0100
0.0075
0.0050
0.0025
0.0000
CONCENTRATION (PPM)
ALD4
ALD3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

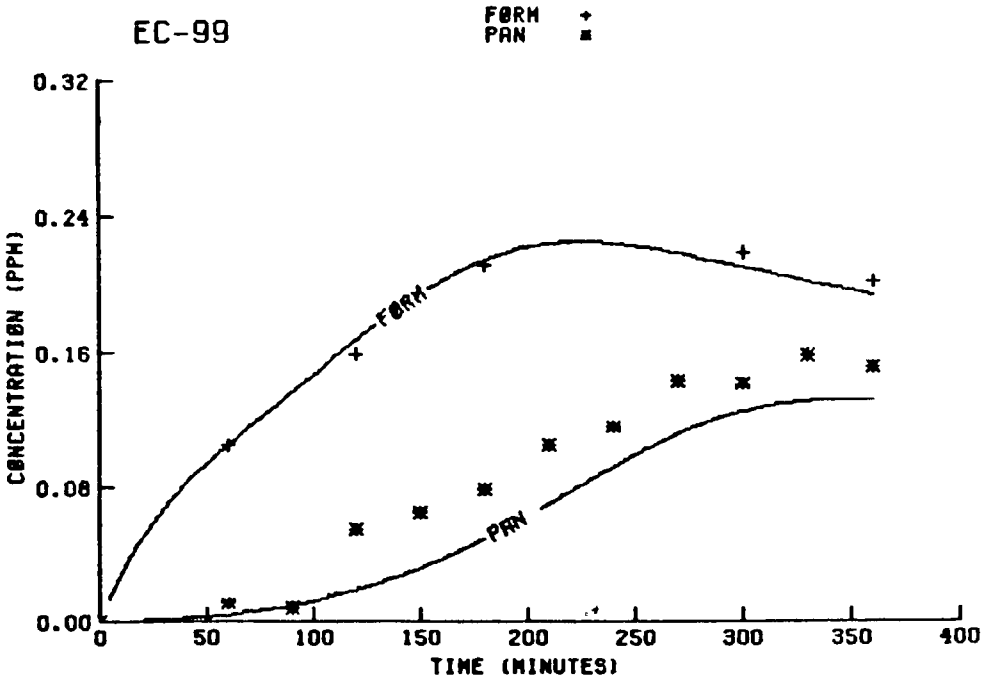

EC-97
FORM +
ALD2 ■
0.40
0.30
0.20
0.10
0.00
CONCENTRATION (PPM)
ALD2
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

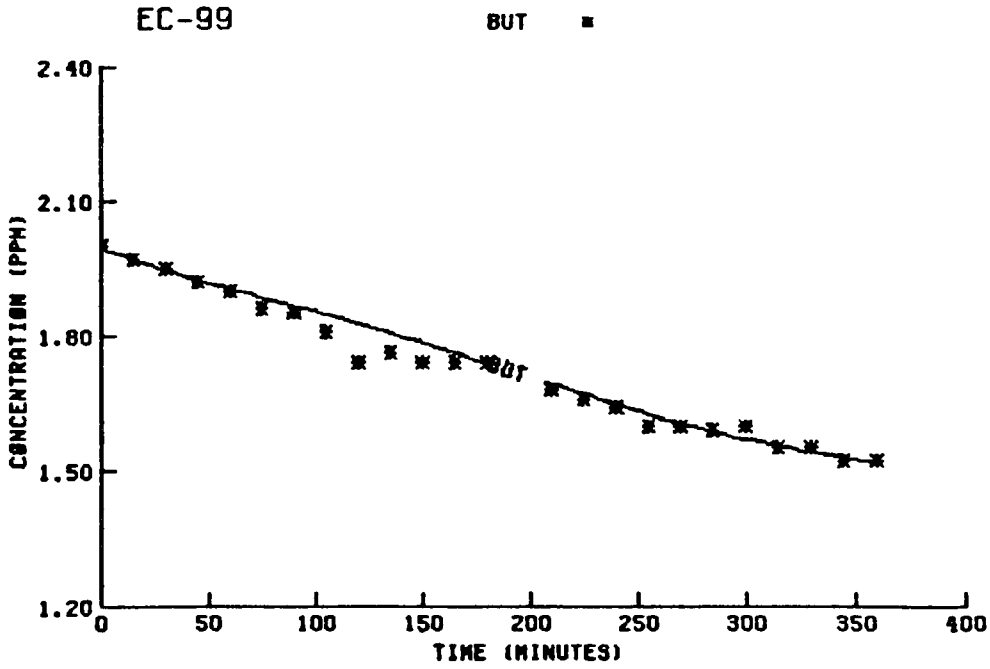

EC-97
SCN3
0.024
0.018
0.012
0.006
0.000
CONCENTRATION (PPM)
SCN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

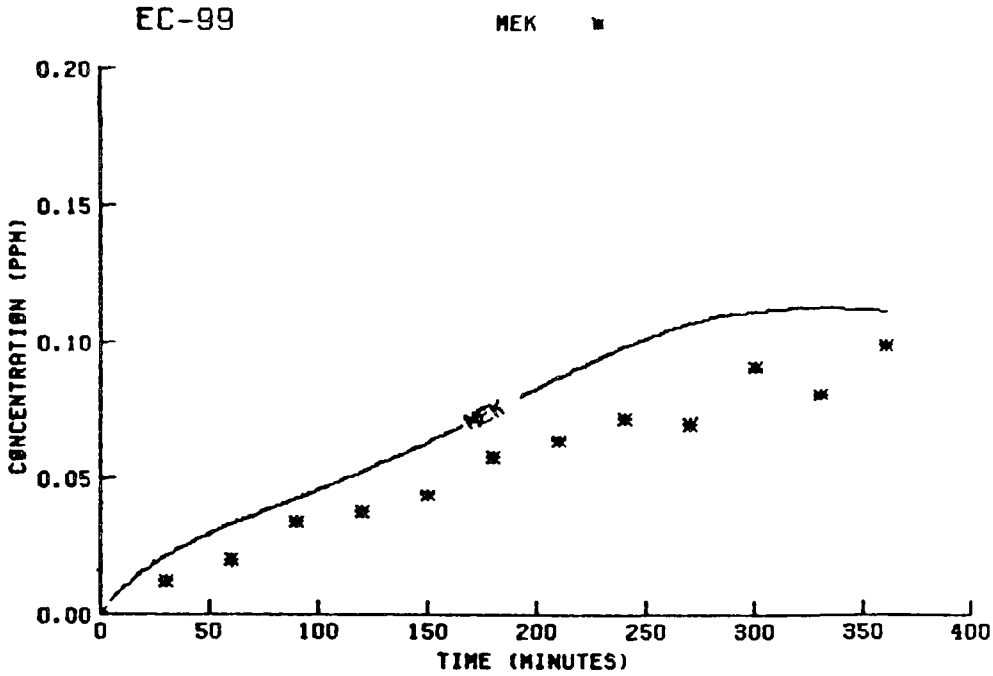

EC-97
C2N3
MEN3
0.0020
0.0015
0.0010
0.0005
0.0000
CONCENTRATION (PPM)
MEN3
C2N3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

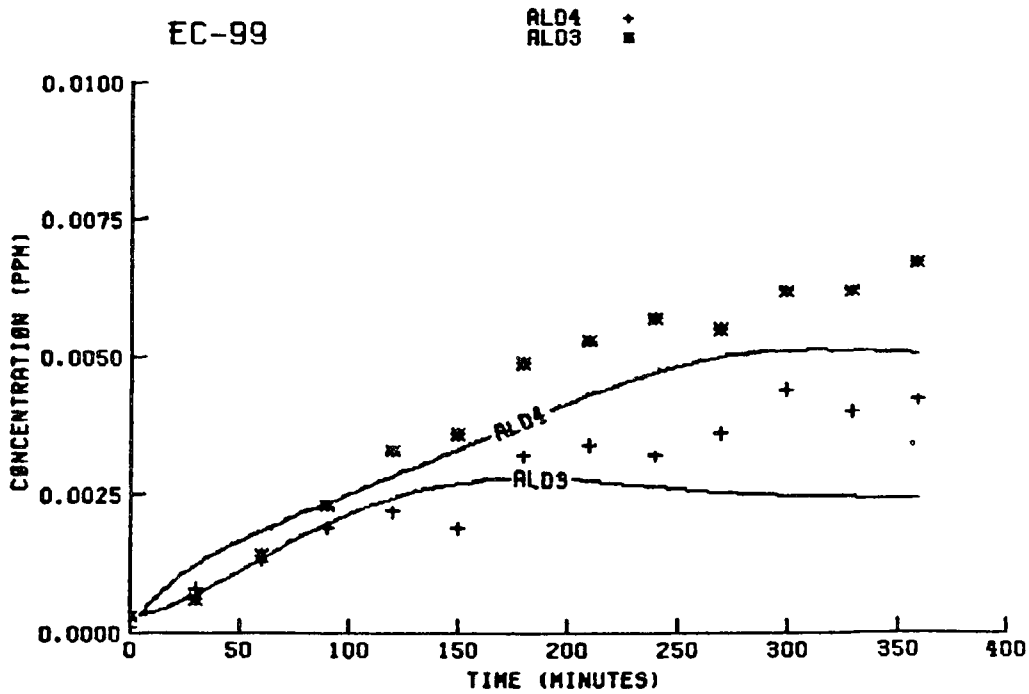

EC-99
NO2
NO
O3
0.80
0.60
0.40
0.20
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

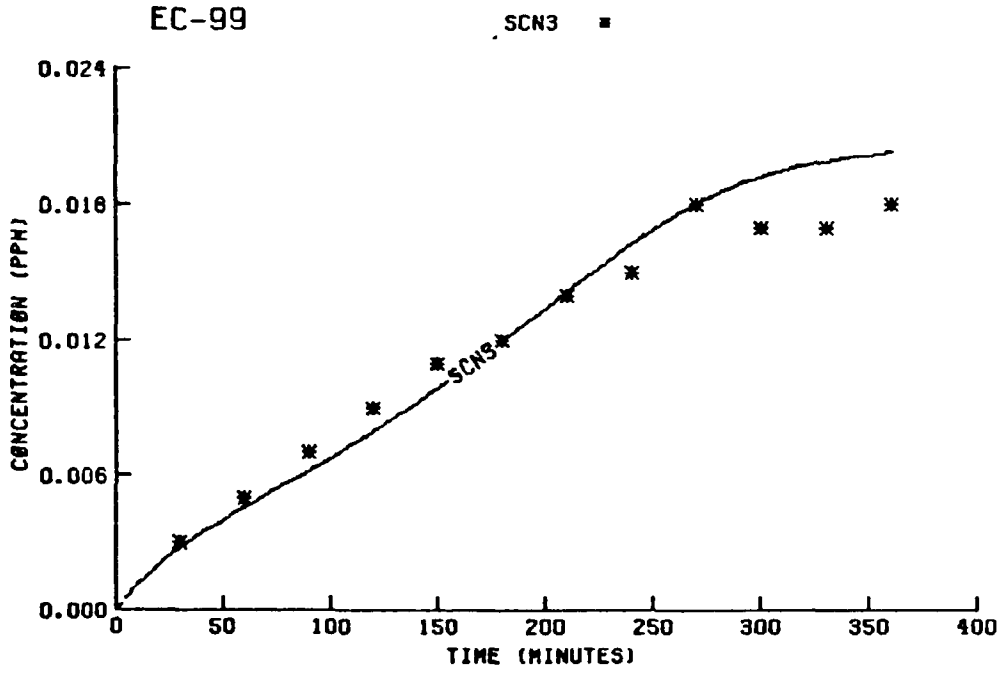

EC-99
PROP
ALD2
0.44
0.33
0.22
0.11
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

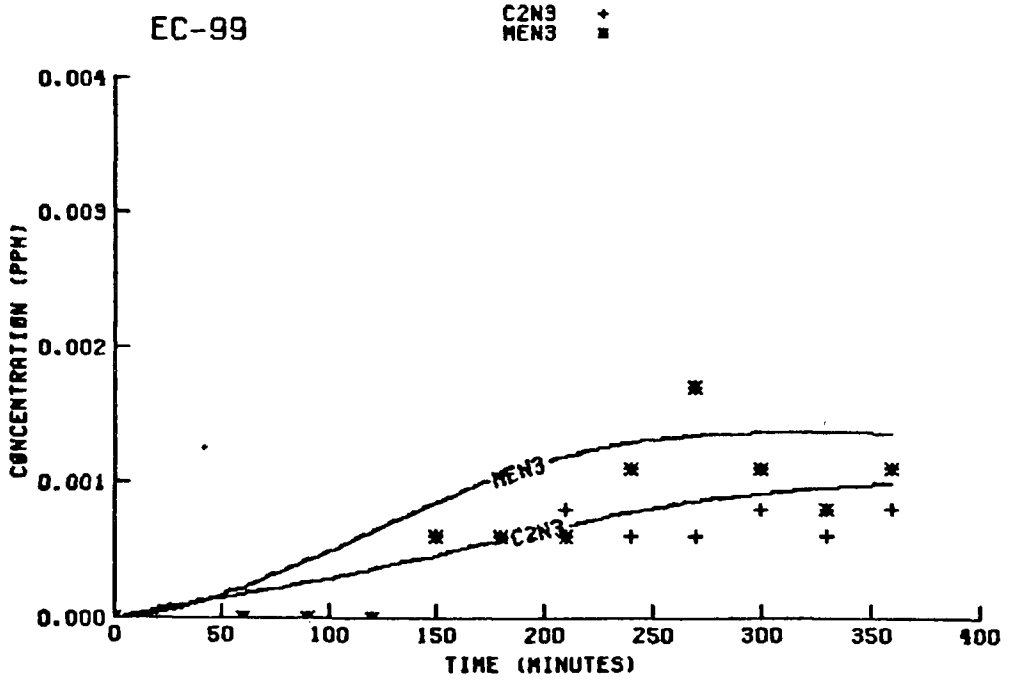

EC-99
FORM +
PAN *
0.32
0.24
0.16
0.08
0.00
CONCENTRATION (PPM)
FORM
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

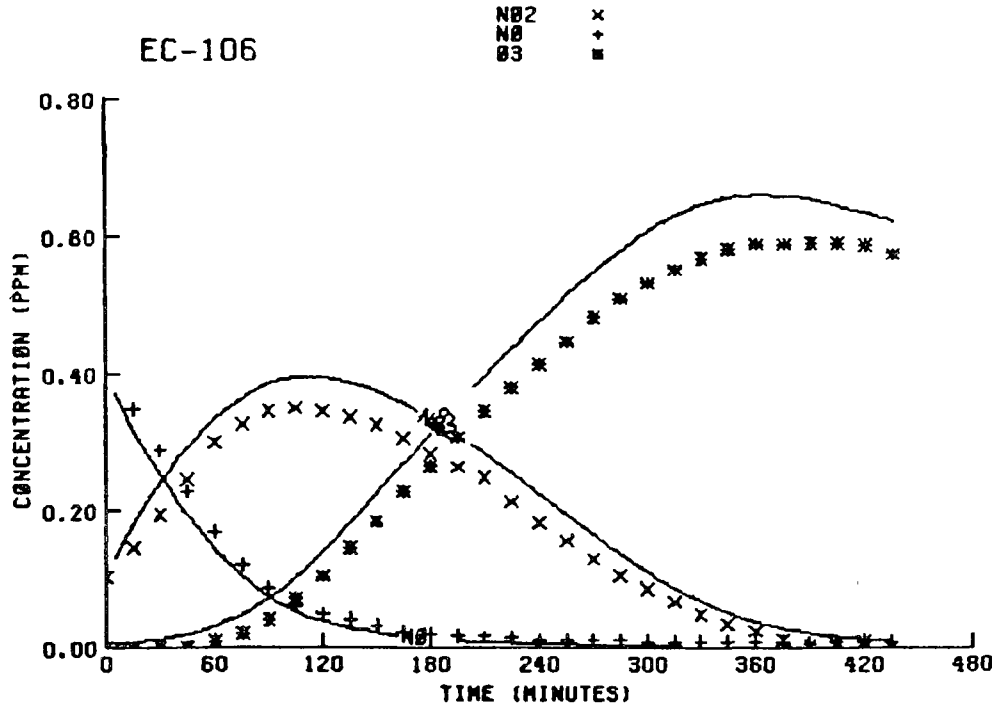

EC-99
BUT *
2.40
2.10
1.80
1.50
1.20
CONCENTRATION (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

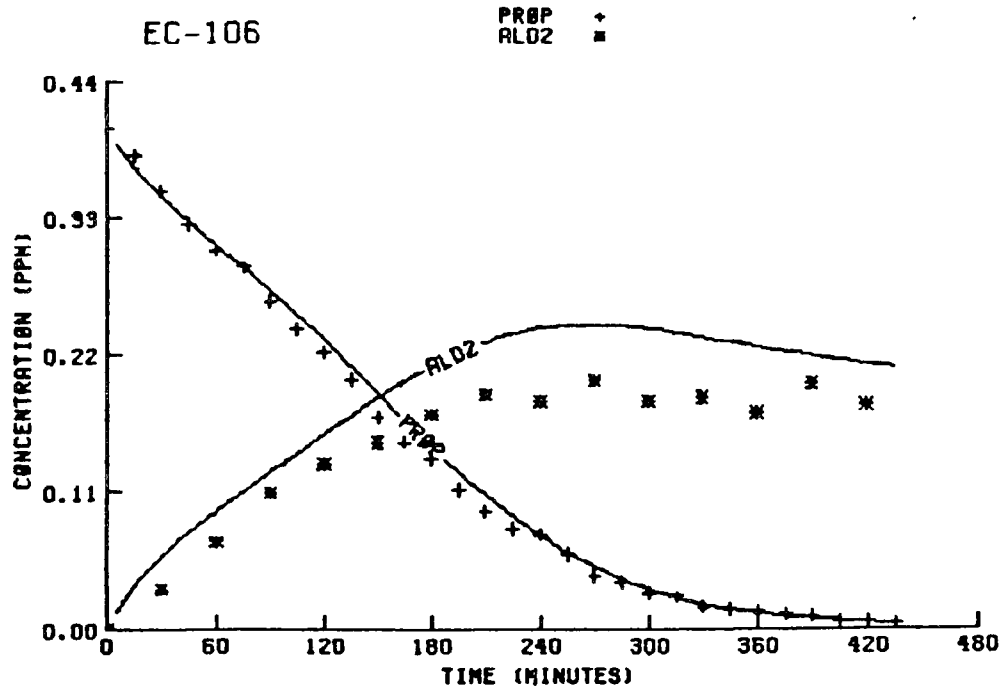

EC-99
MEK
0.20
0.15
0.10
0.05
0.00
CONCENTRATION (PPM)
MEK
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

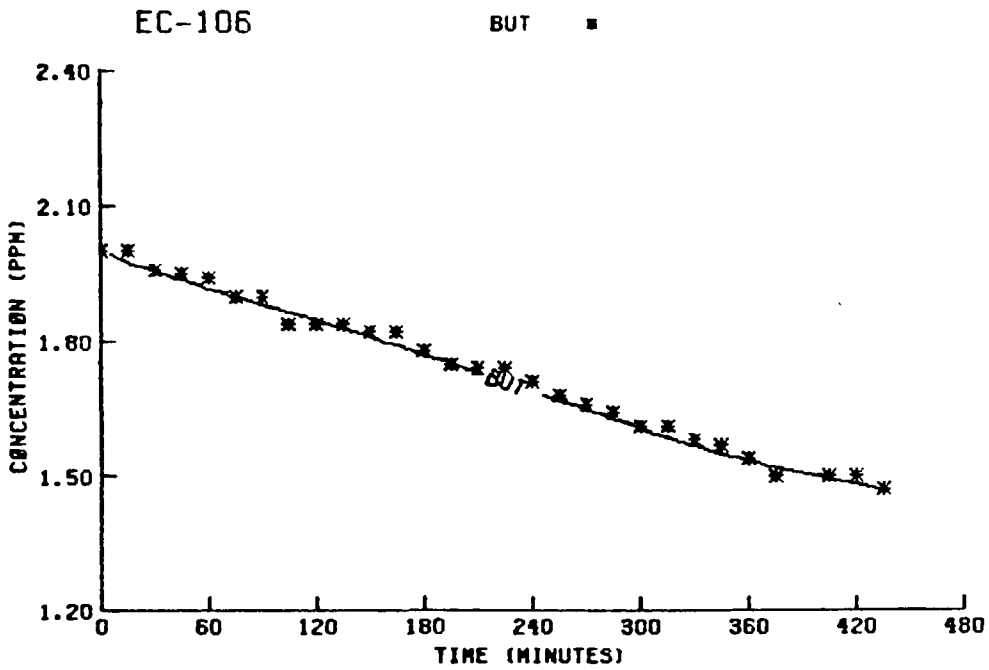

EC-99
ALD4
ALD3
0.0100
0.0075
0.0050
0.0025
0.0000
CONCENTRATION (PPM)
ALD4
ALD3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

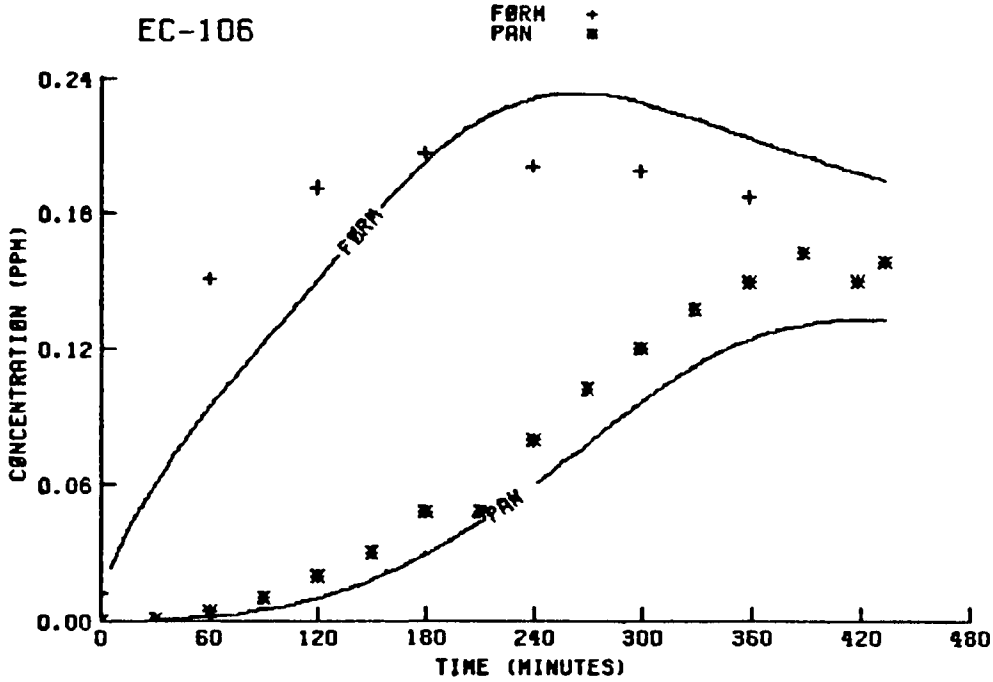

EC-99
SCN3 *
0.024
0.018
0.012
0.006
0.000
CONCENTRATION (PPM)
SCN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

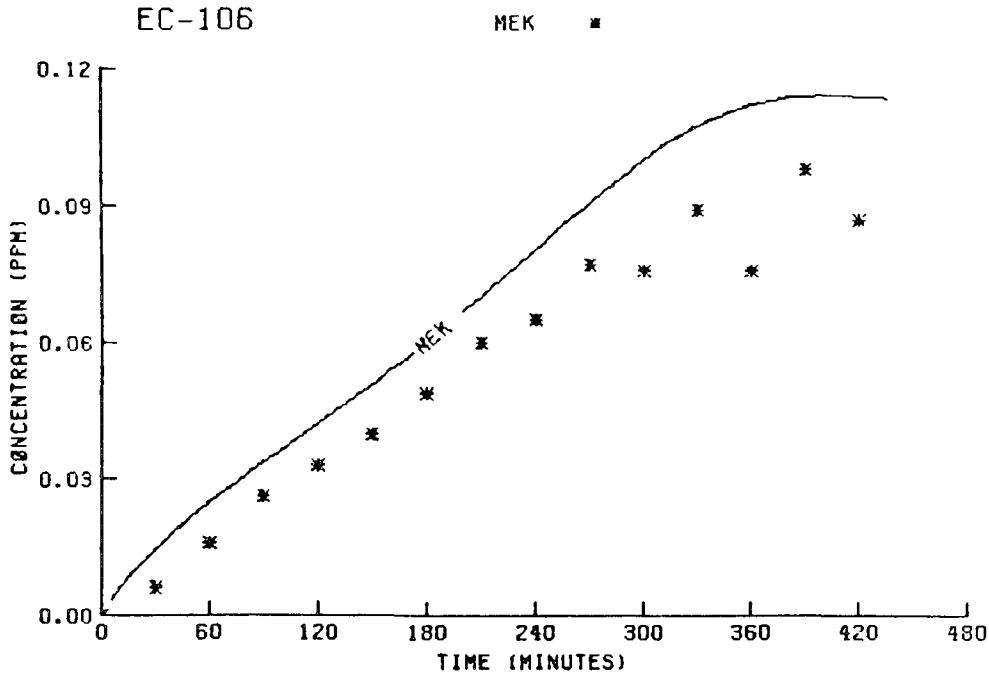

EC-99
C2N3 +
MEN3 *
0.004
0.003
0.002
0.001
0.000
CONCENTRATION (PPM)
MEN3
C2N3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

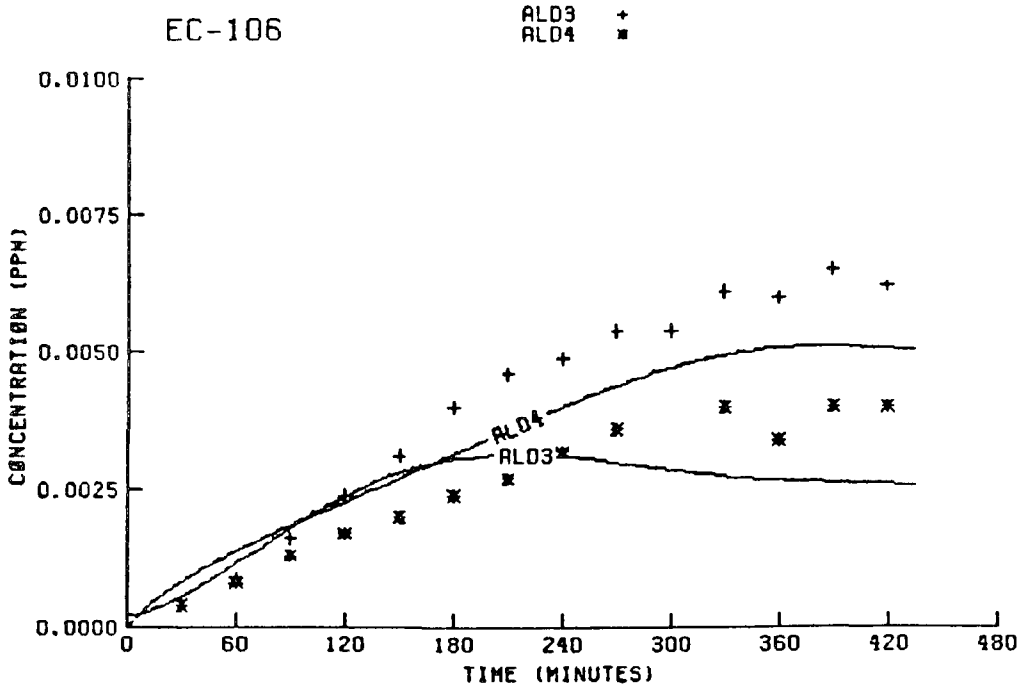

EC-106
NØ2
NØ
Ø3
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
0
60
120
180
240
300
360
420
480
TIME (MINUTES)
NØ2
NØ
Ø3

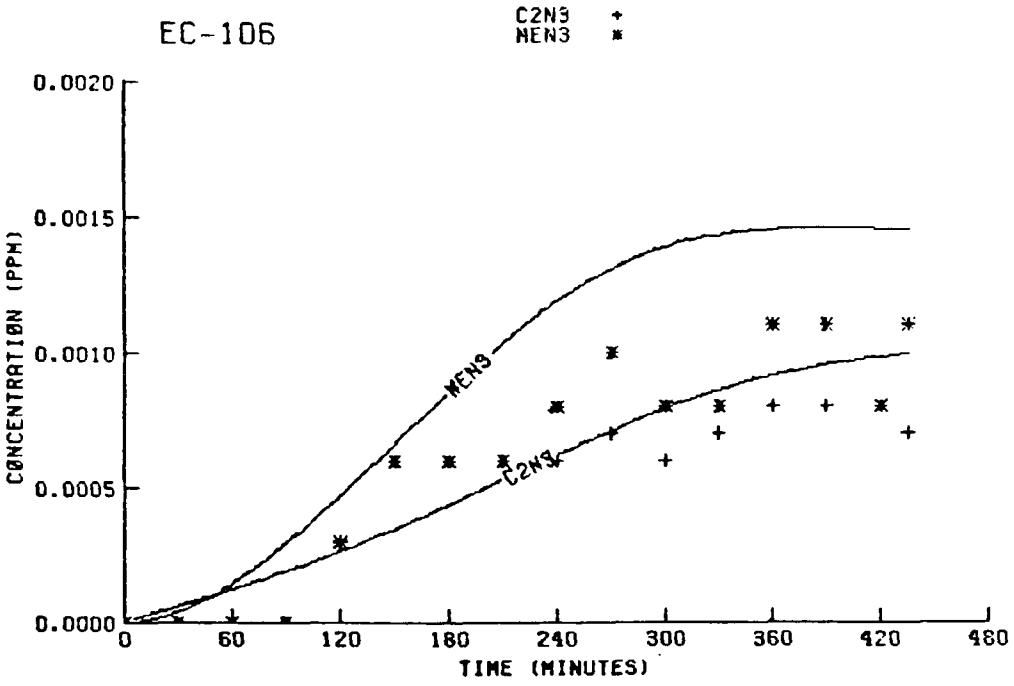

EC-106
PRØP
ALD2
0.44
0.33
0.22
0.11
0.00
CØNCENTRATIØN (PPM)
0
60
120
180
240
300
360
420
480
TIME (MINUTES)
ALD2
PRØP

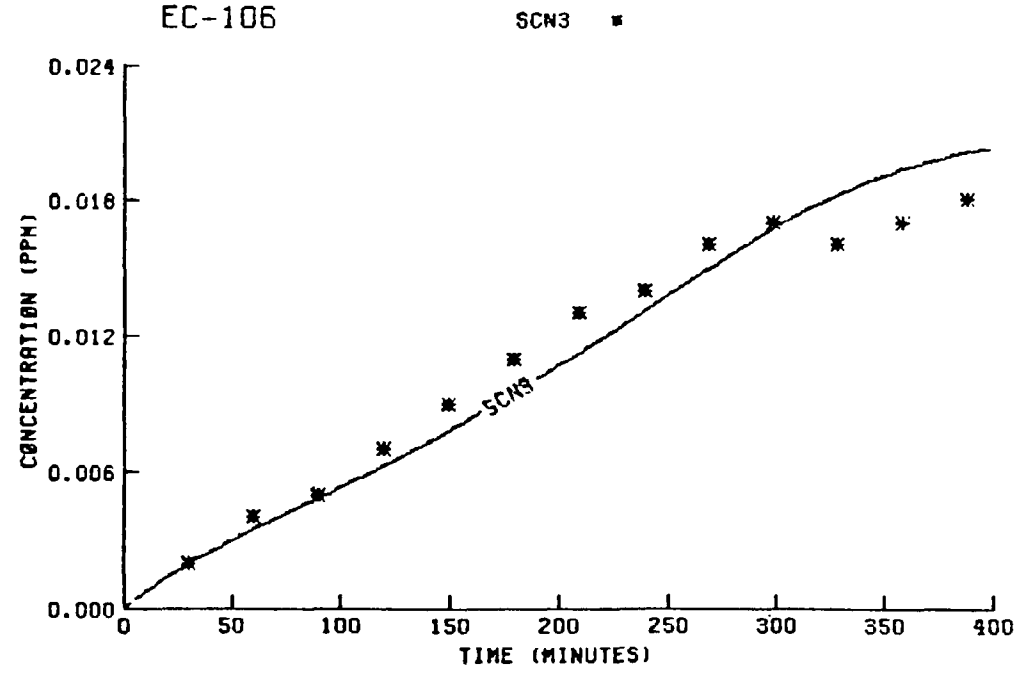

EC-106
BUT
2.40
2.10
1.80
1.50
1.20
CONCENTRATION (PPM)
0
60
120
180
240
300
360
420
480
TIME (MINUTES)
BUT

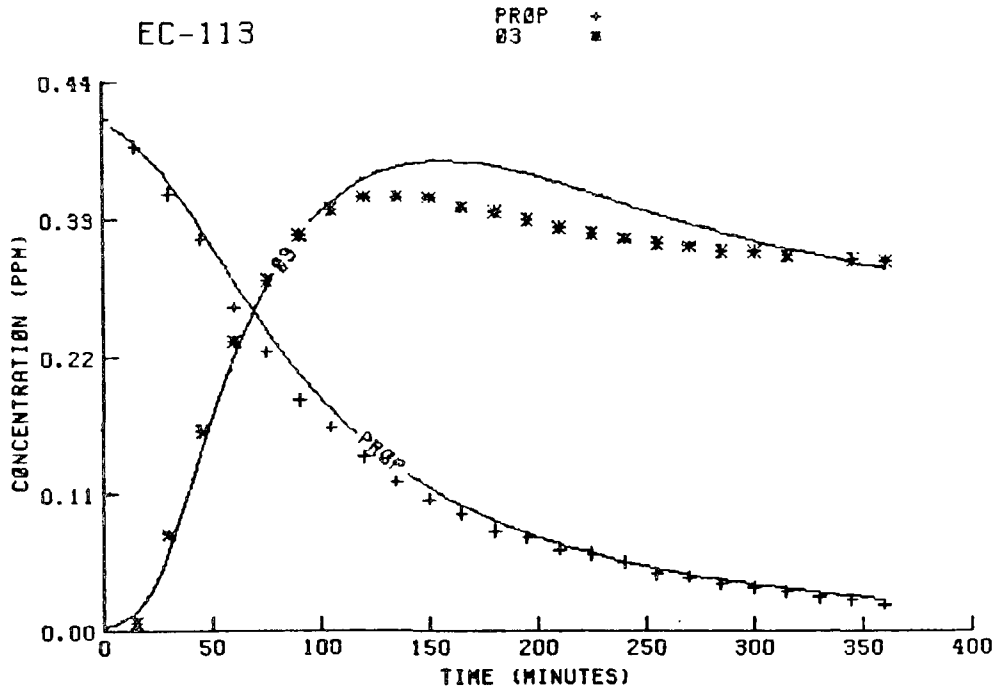

EC-106
FORM
PAN
0.24
0.18
0.12
0.06
0.00
CONCENTRATION (PPM)
0
60
120
180
240
300
360
420
480
TIME (MINUTES)
FORM
PAN

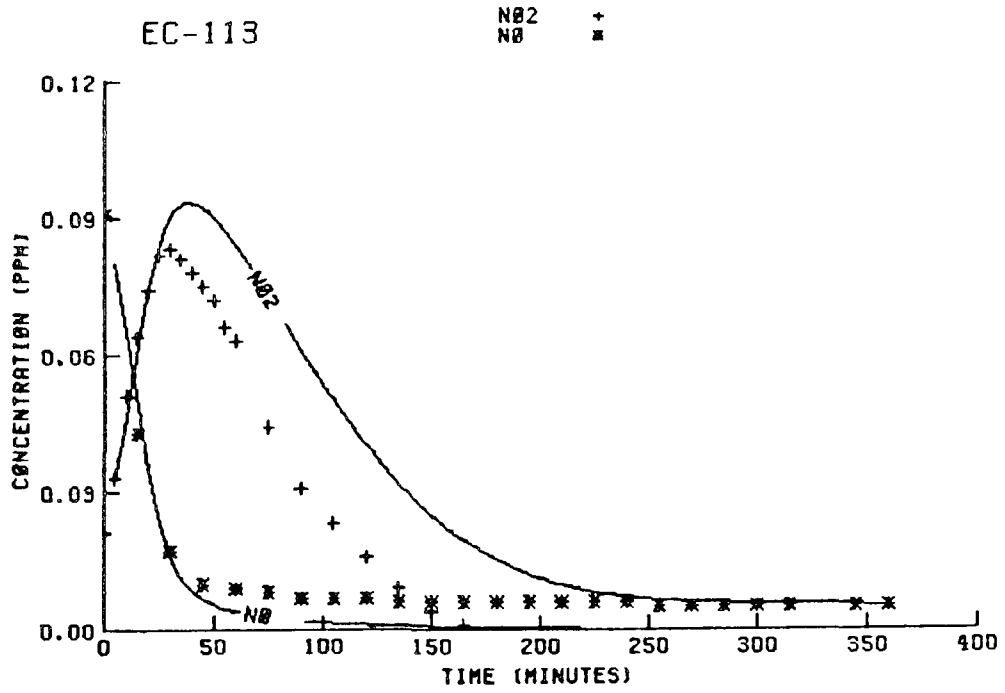

EC-106
MEK
0.12
0.09
0.06
0.03
0.00
CONCENTRATION (PPM)
MEK
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

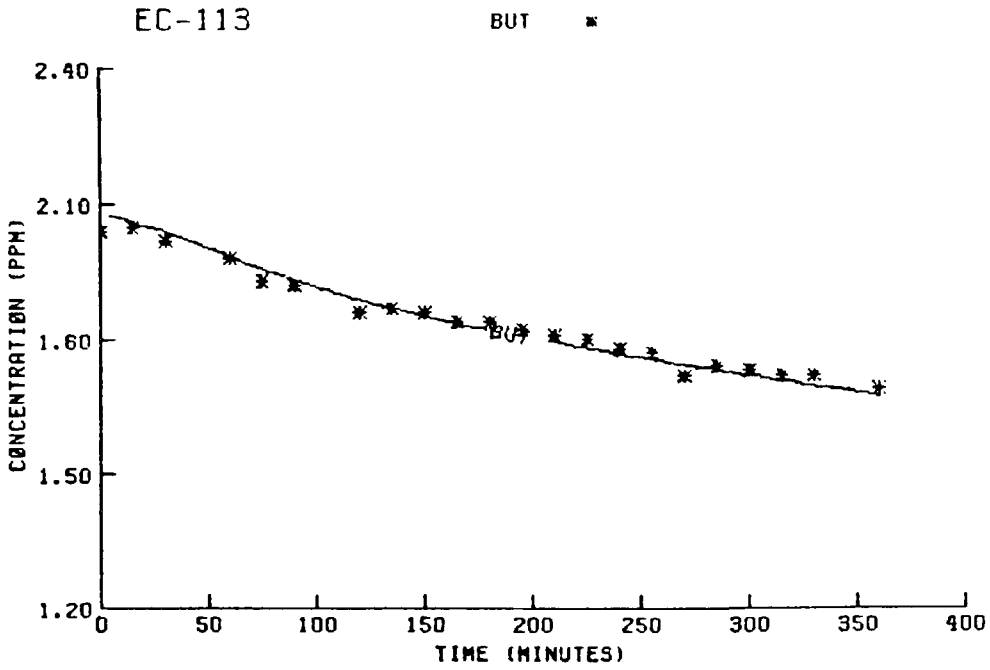

EC-106
ALD3
ALD4
0.0100
0.0075
0.0050
0.0025
0.0000
CONCENTRATION (PPM)
ALD4
ALD3
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

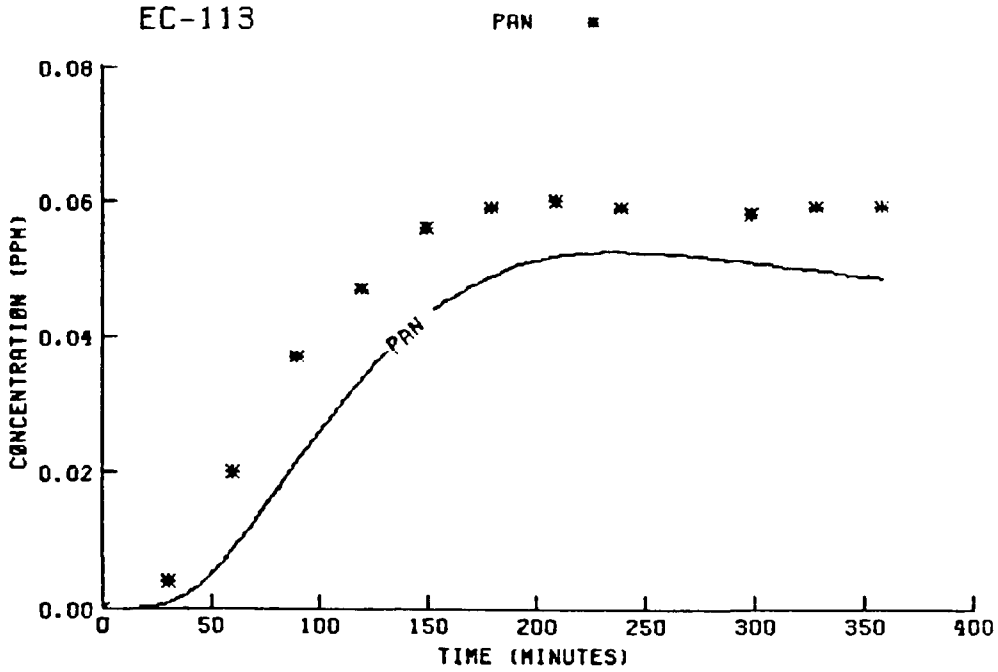

EC-106
C2N3 +
MEN3 *
0.0020
0.0015
0.0010
0.0005
0.0000
CONCENTRATION (PPM)
MEN3
C2N3
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

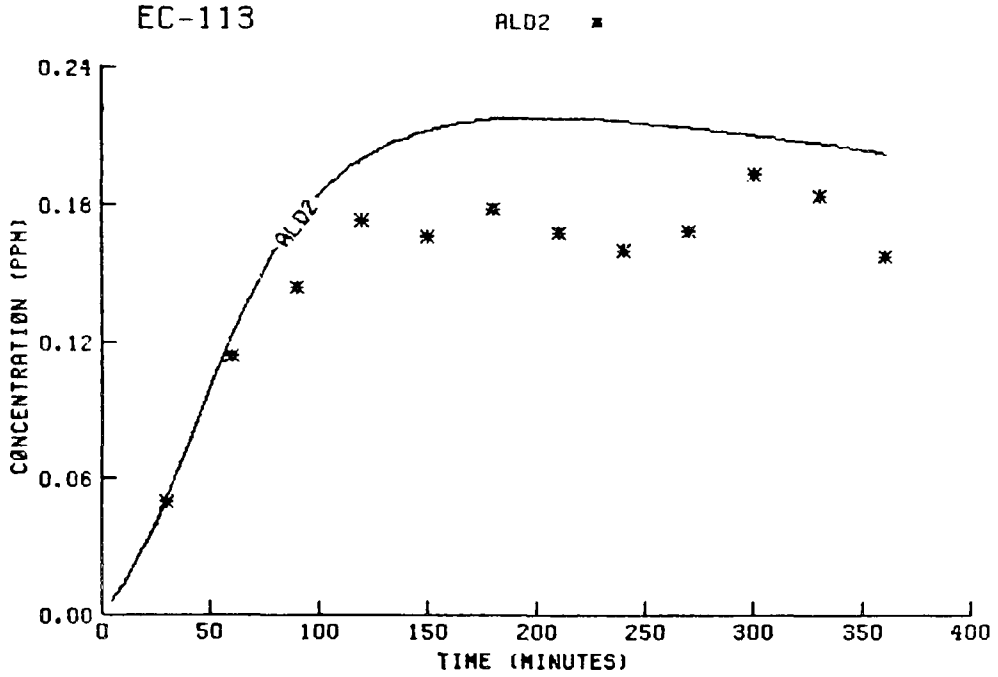

EC-106
SCN3 *
0.024
0.018
0.012
0.006
0.000
CONCENTRATION (PPM)
SCN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

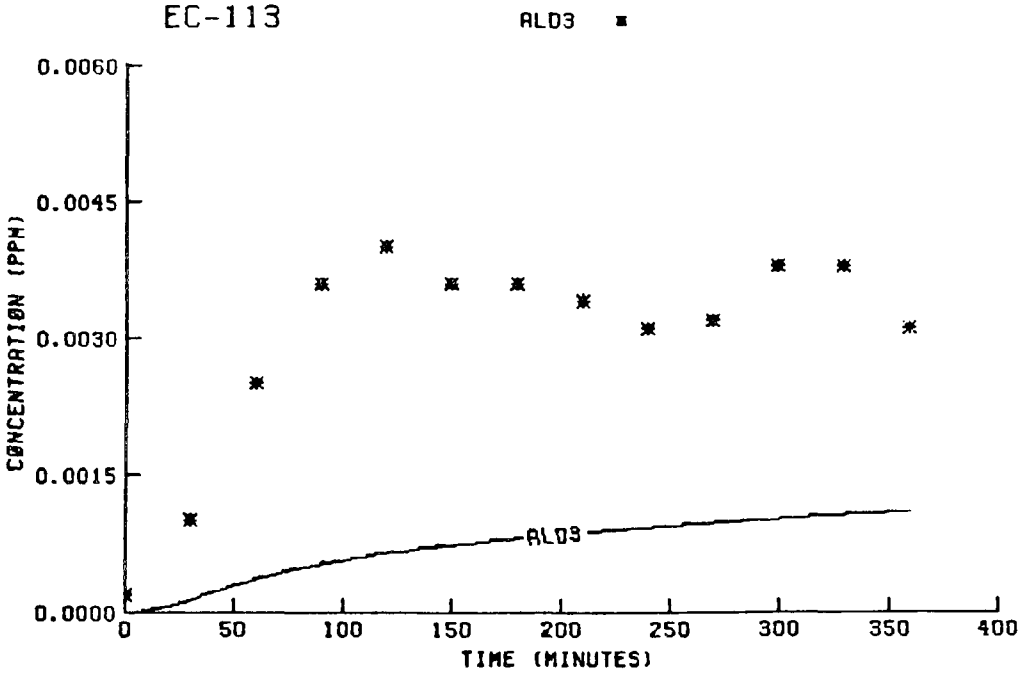

EC-113
PRØP
Ø3
CØNCENTRATIØN (PPM)
0.44
0.33
0.22
0.11
0.00
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
Ø3
PRØP

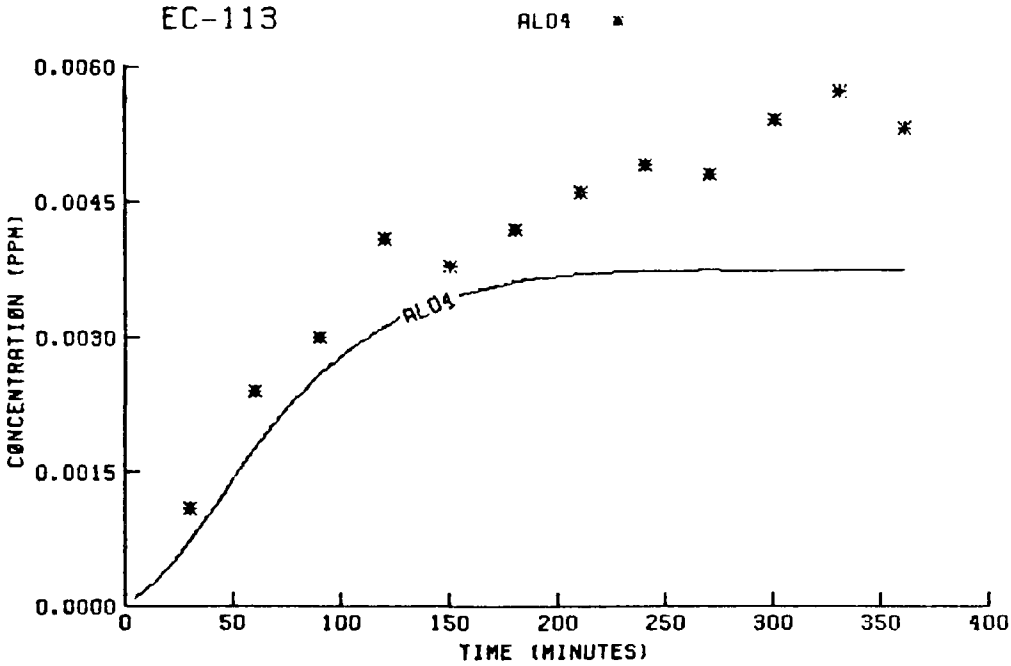

EC-113
NØ2
NØ
CØNCENTRATIØN (PPM)
0.12
0.09
0.06
0.03
0.00
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
NØ2
NØ

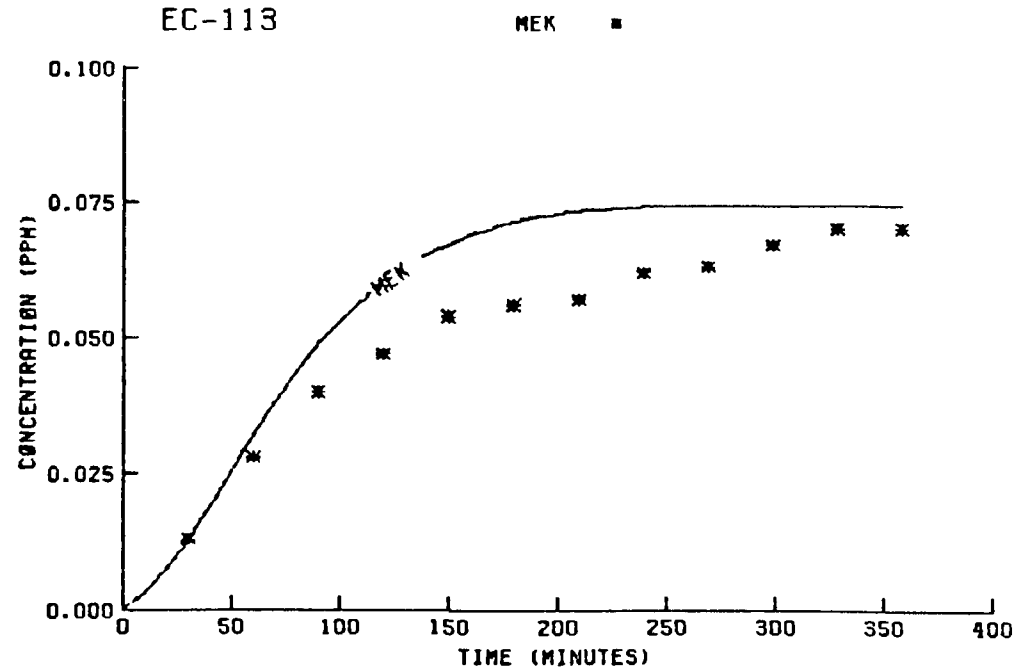

EC-113
BUT
2.40
2.10
1.60
1.50
1.20
CONCENTRATION (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

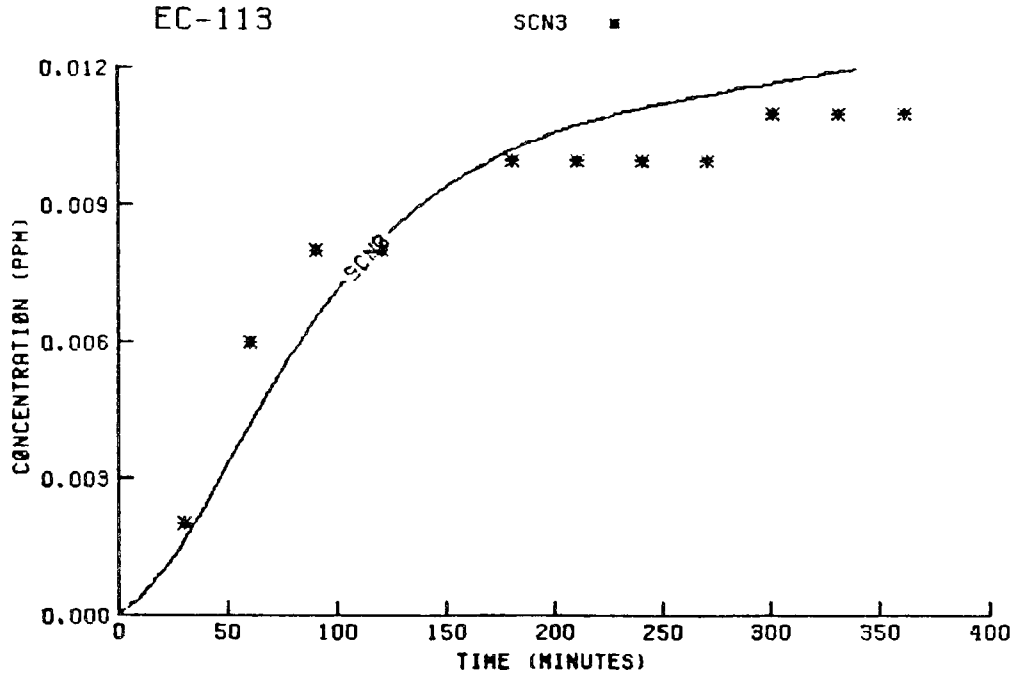

EC-113
PAN
0.08
0.06
0.04
0.02
0.00
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

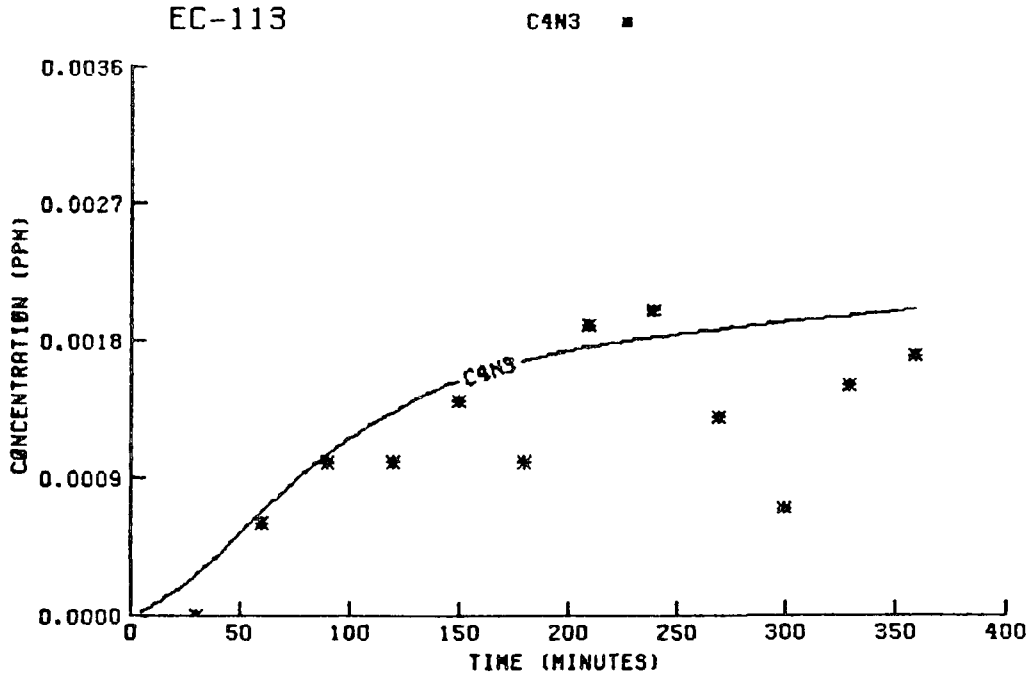

EC-113
ALD2
0.24
0.18
0.12
0.06
0.00
CONCENTRATION (PPM)
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

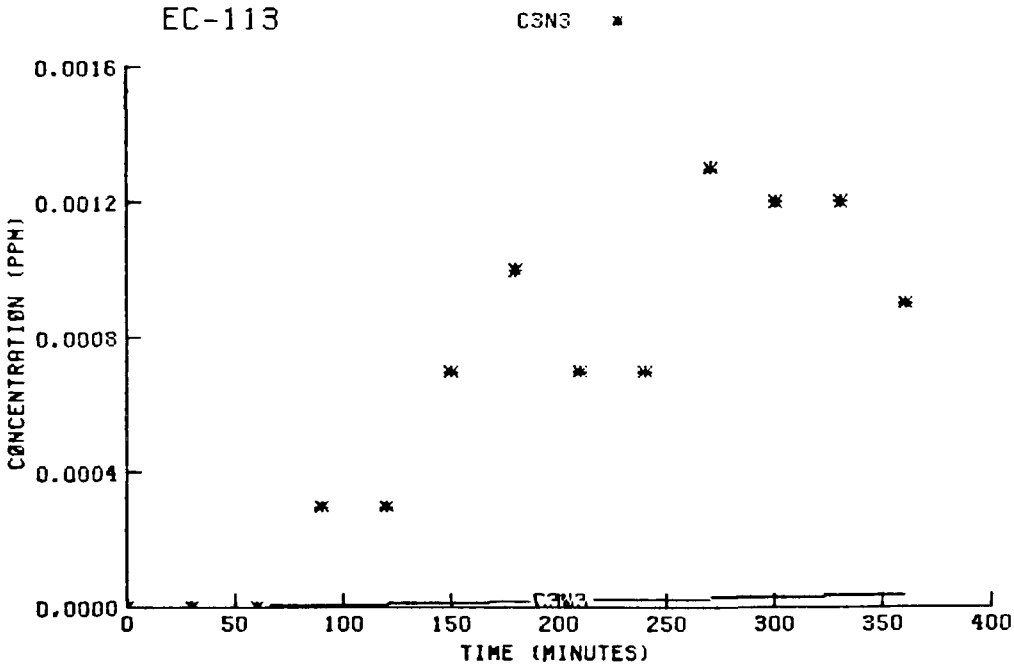

EC-113
ALD3
0.0060
0.0045
0.0030
0.0015
0.0000
CONCENTRATION (PPM)
ALD3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

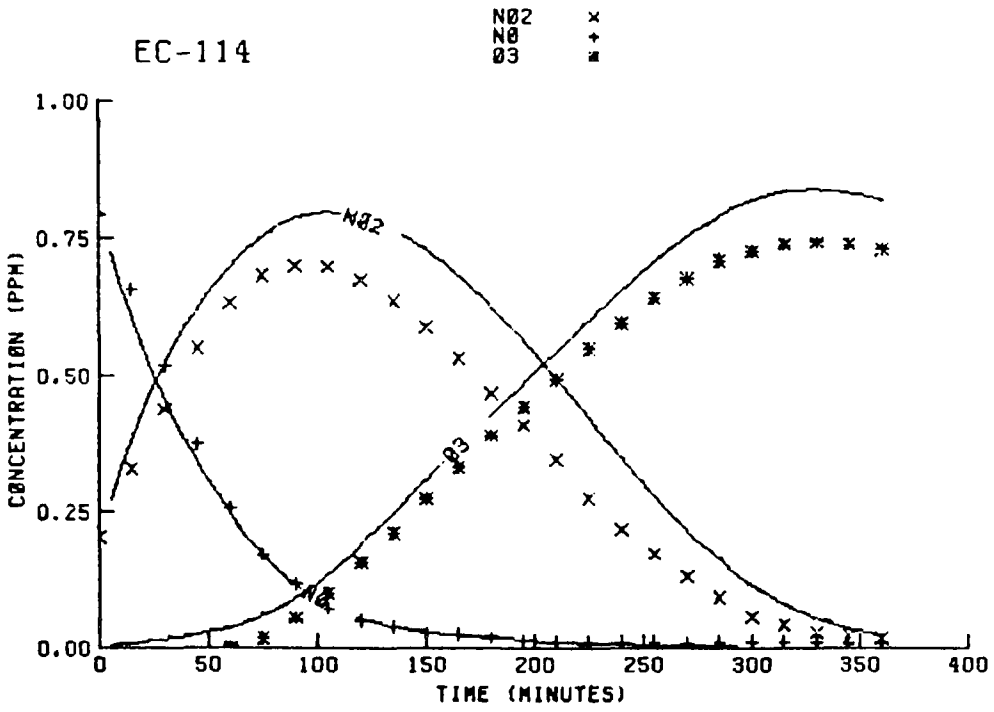

EC-113
ALO4
0.0060
0.0045
0.0030
0.0015
0.0000
CONCENTRATION (PPM)
ALO4
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

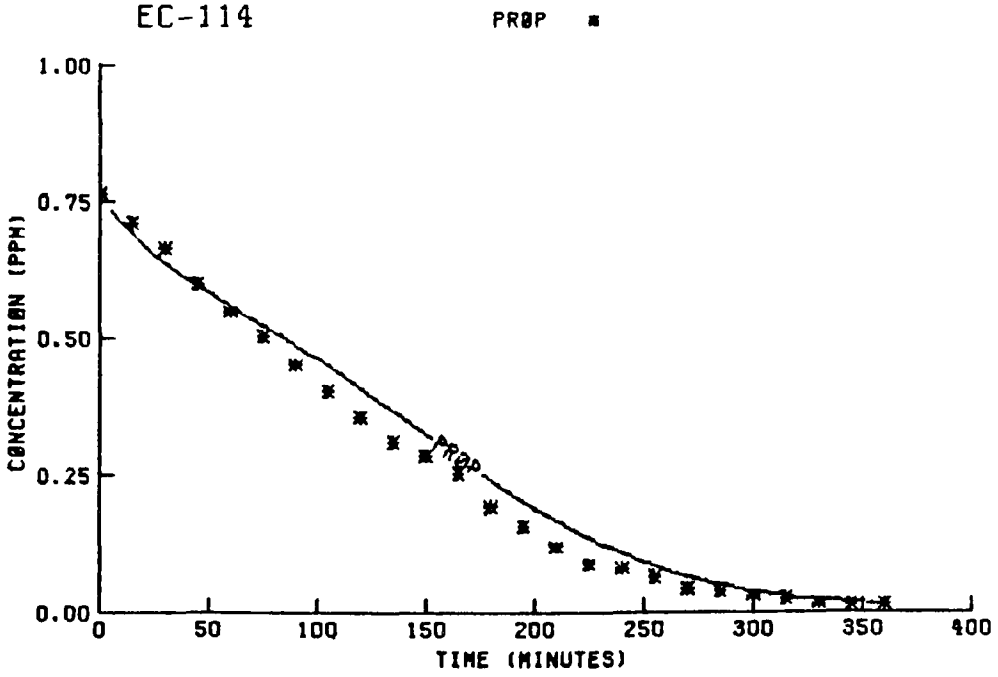

EC-113
MEK
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
MEK
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

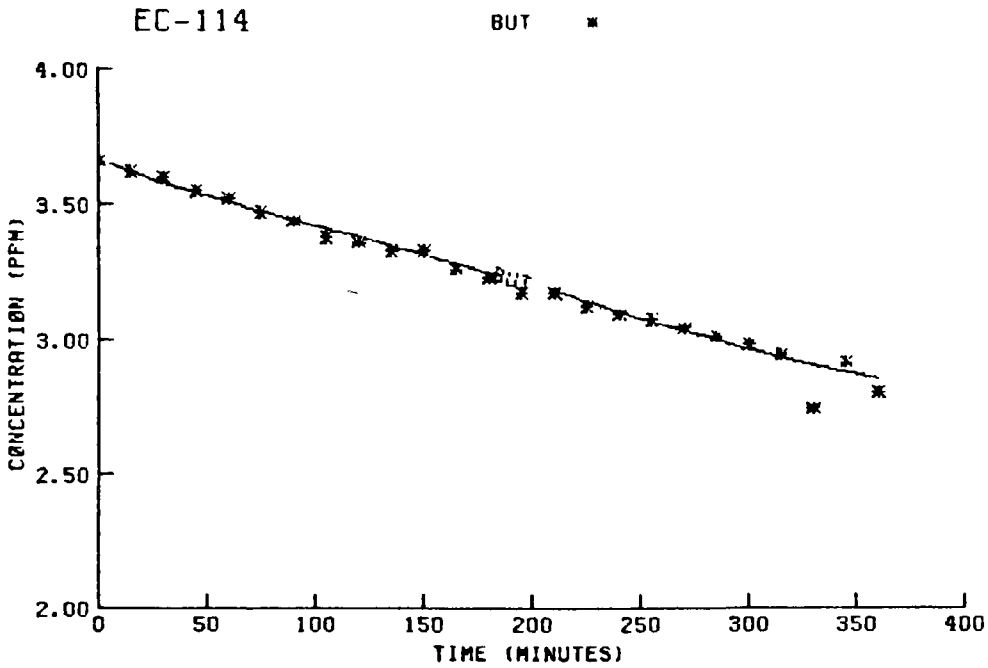

EC-113
SCN3
0.012
0.009
0.006
0.003
0.000
CONCENTRATION (PPM)
SCN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

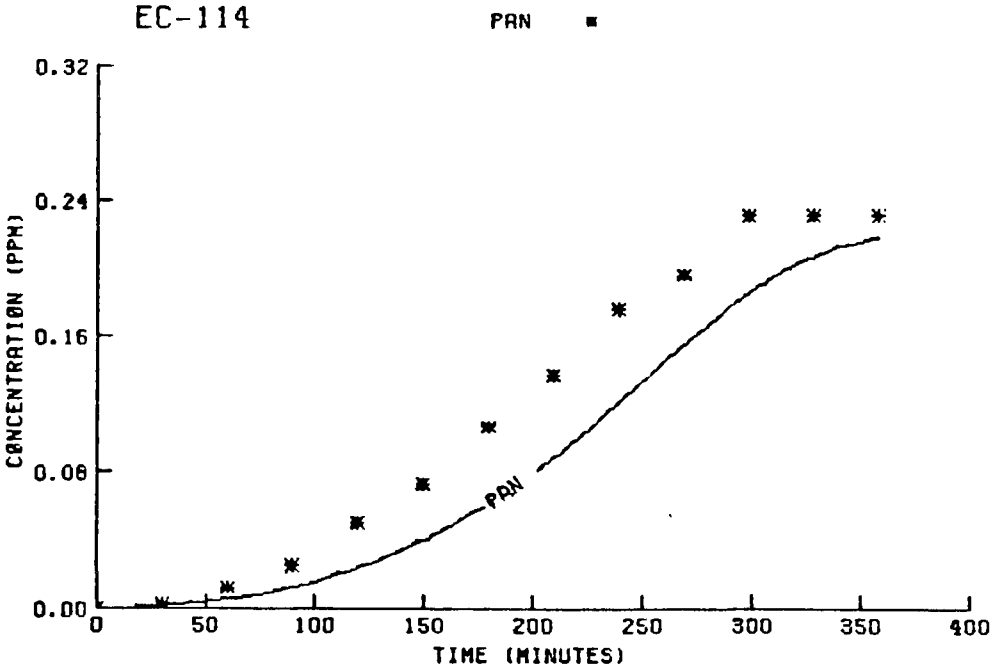

EC-113
C4N3
0.0036
0.0027
0.0018
0.0009
0.0000
CONCENTRATION (PPM)
C4N3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

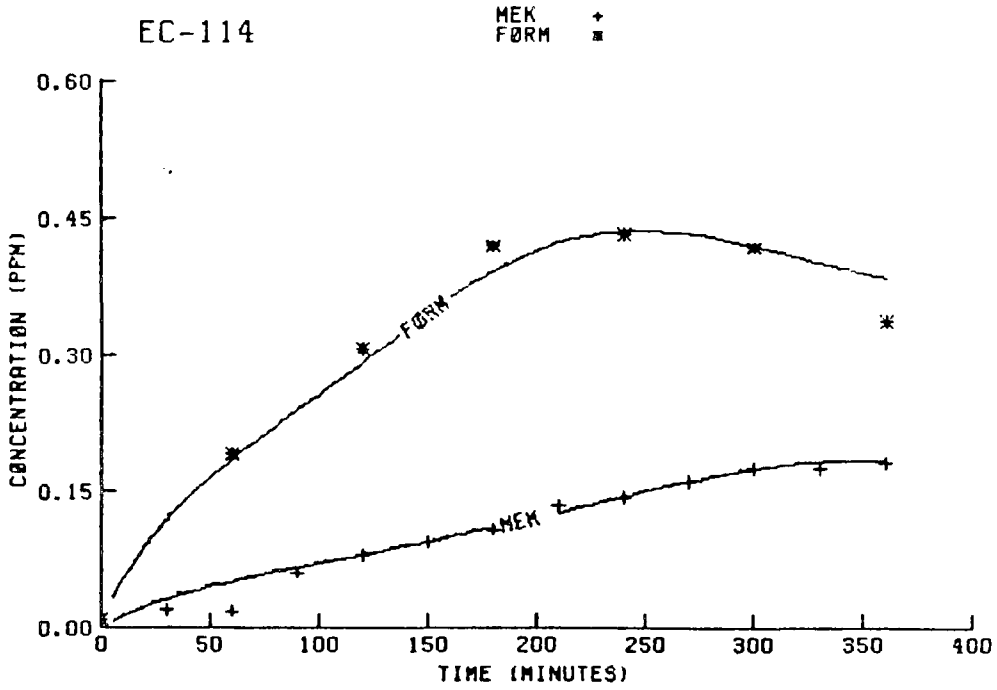

EC-113
C3N3
0.0016
0.0012
0.0008
0.0004
0.0000
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
C3N3

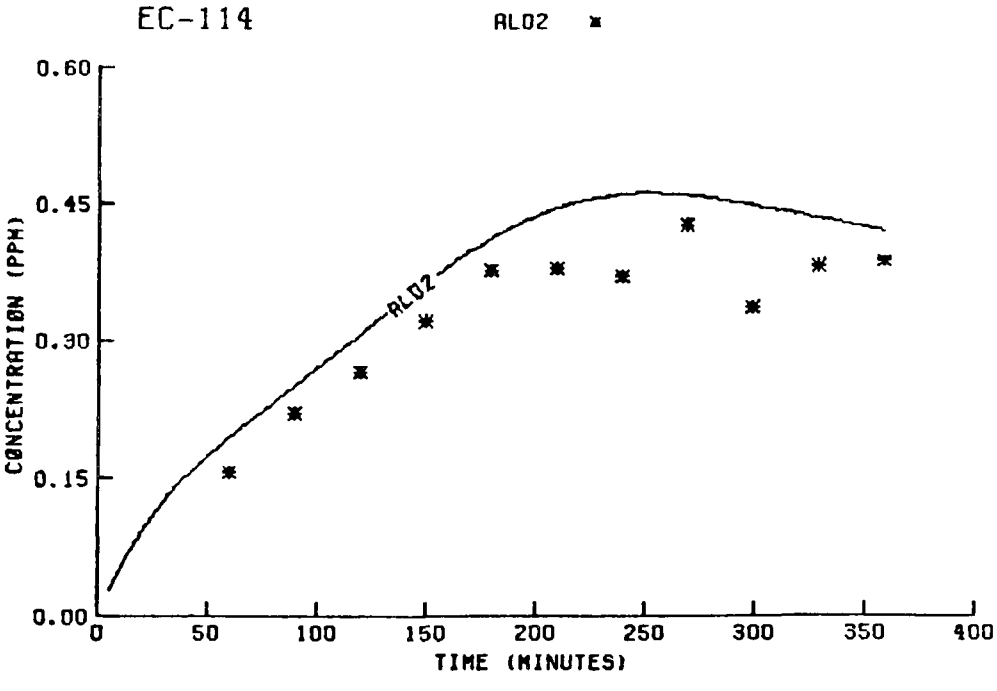

EC-114
NØ2 ×
NØ +
Ø3 ∗
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

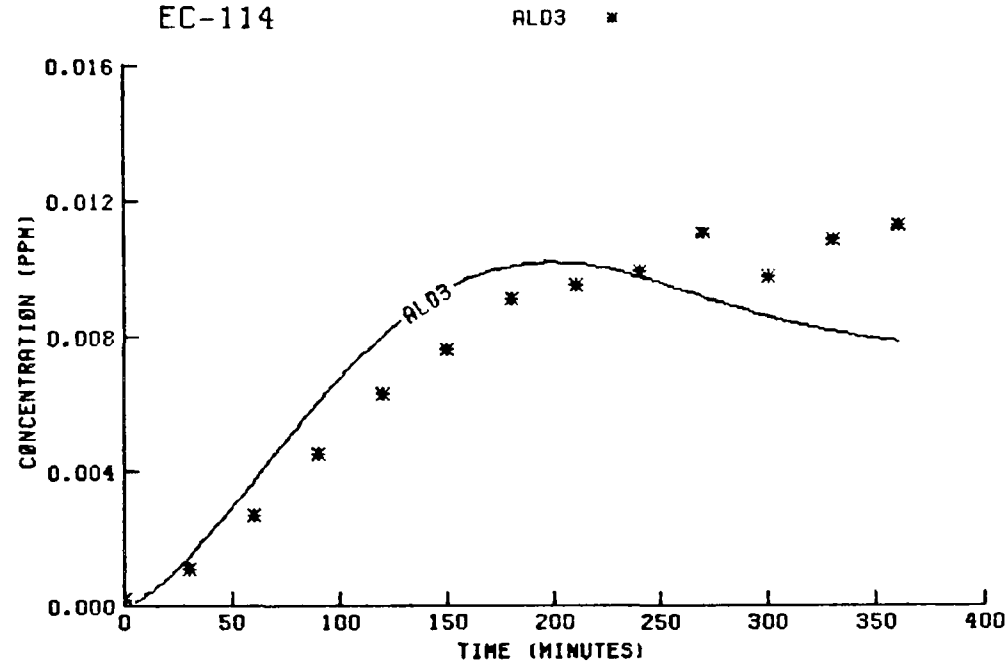

EC-114
PRØP ∗
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
PRØP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

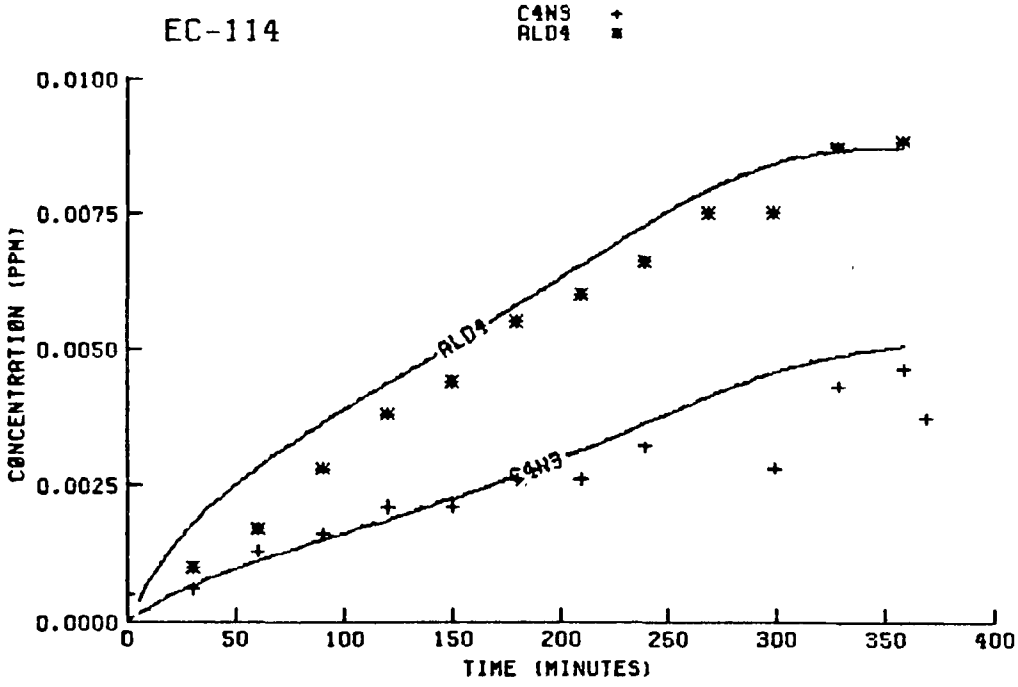

EC-114
BUT
4.00
3.50
3.00
2.50
2.00
CONCENTRATION (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

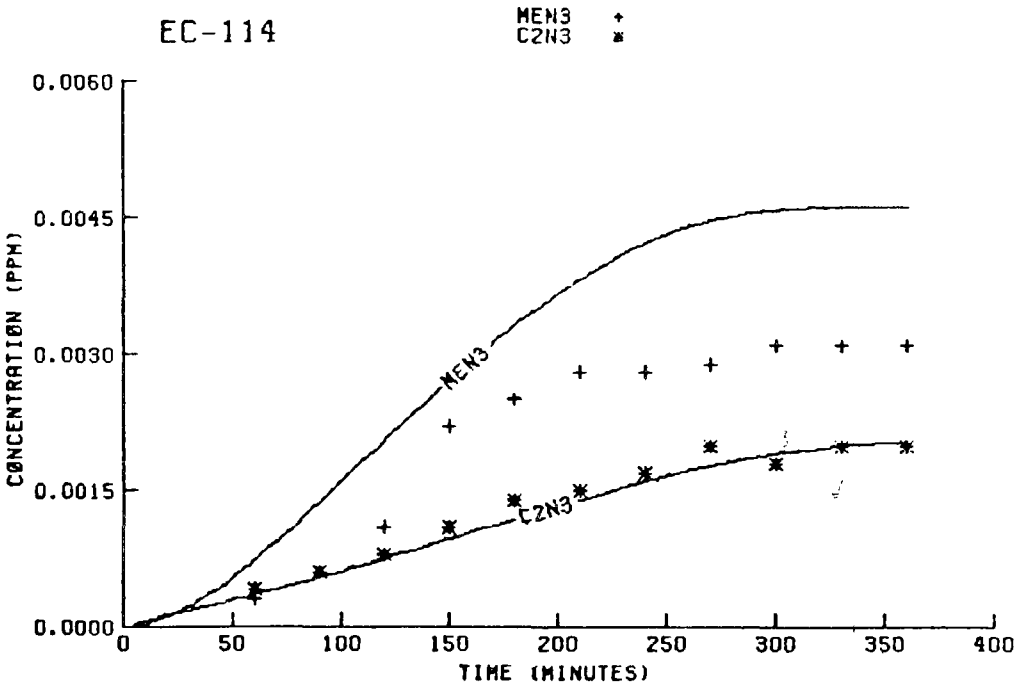

EC-114
PAN
0.32
0.24
0.16
0.08
0.00
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

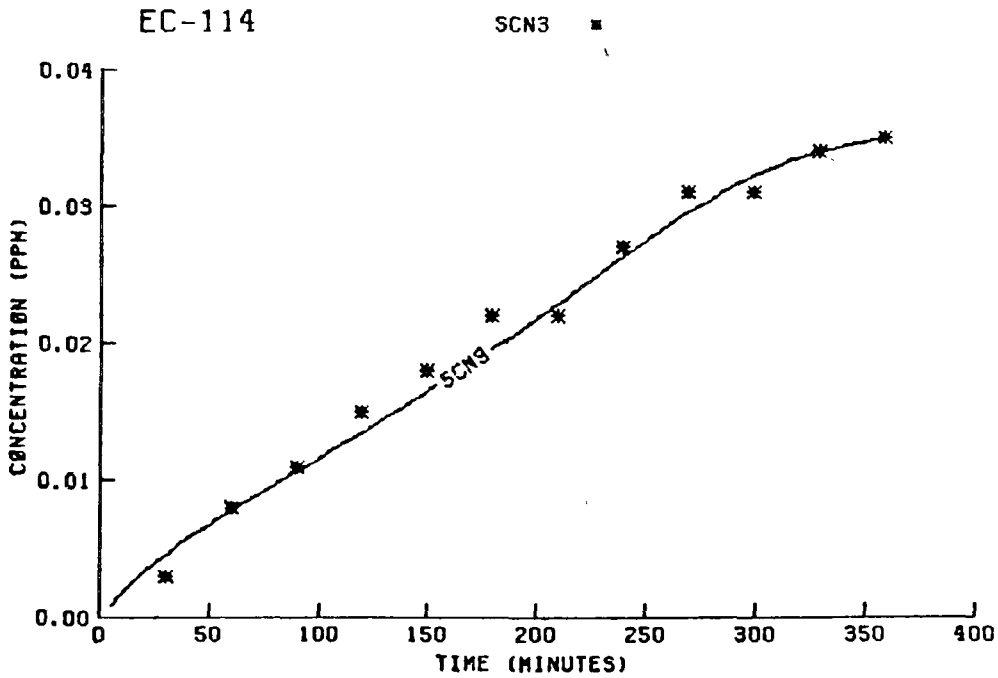

EC-114
MEK +
FORM *
0.60
0.45
0.30
0.15
0.00
CONCENTRATION (PPM)
FORM
MEK
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

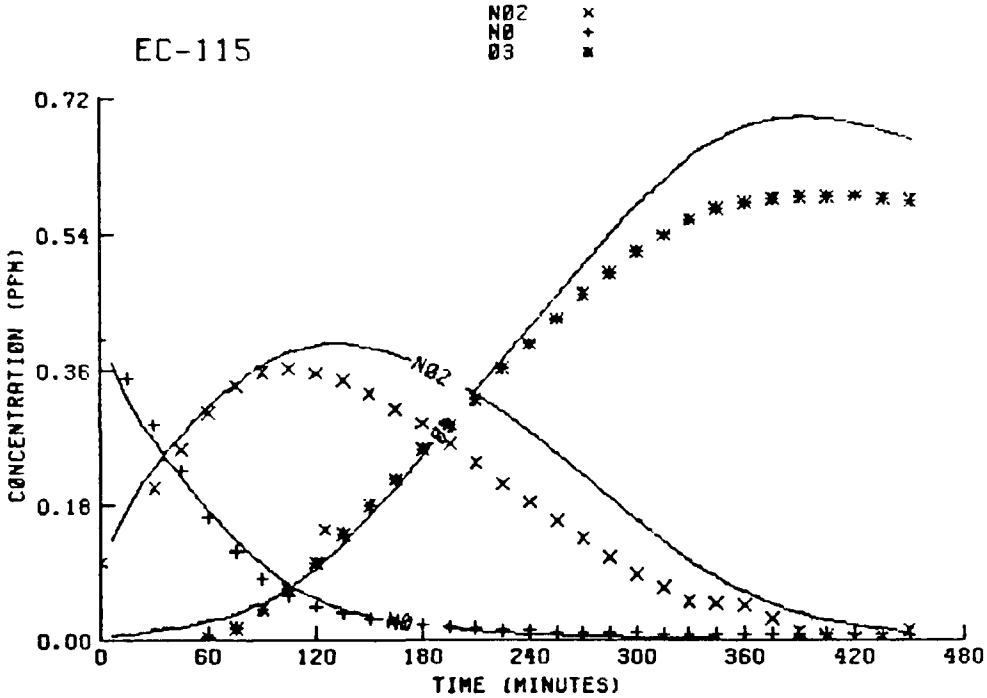

EC-114
ALD2 *
0.60
0.45
0.30
0.15
0.00
CONCENTRATION (PPM)
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

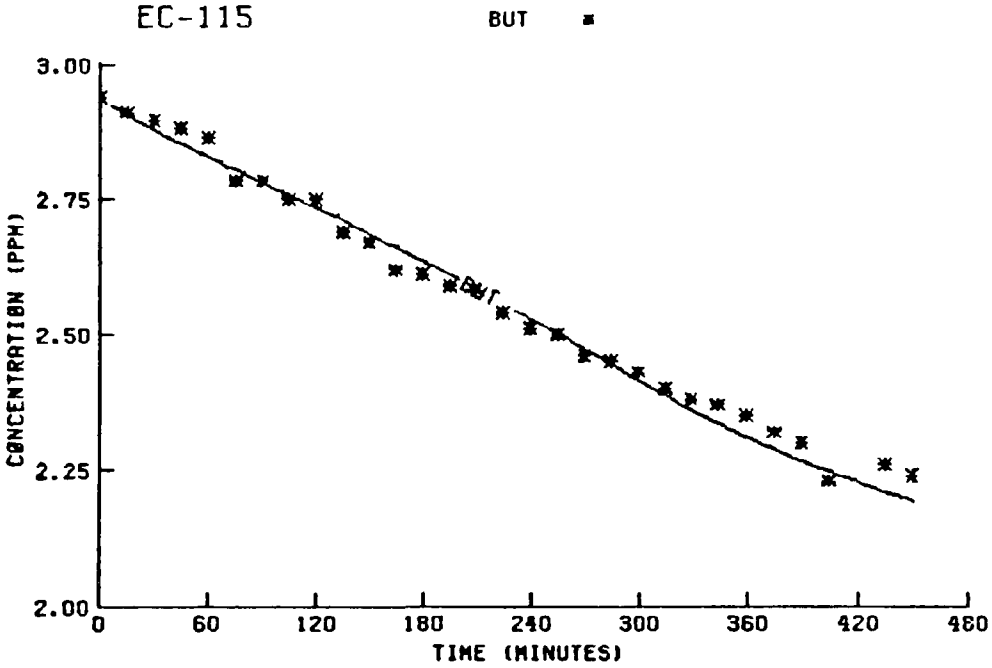

EC-114
ALD3
0.016
0.012
0.008
0.004
0.000
CONCENTRATION (PPM)
ALD3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

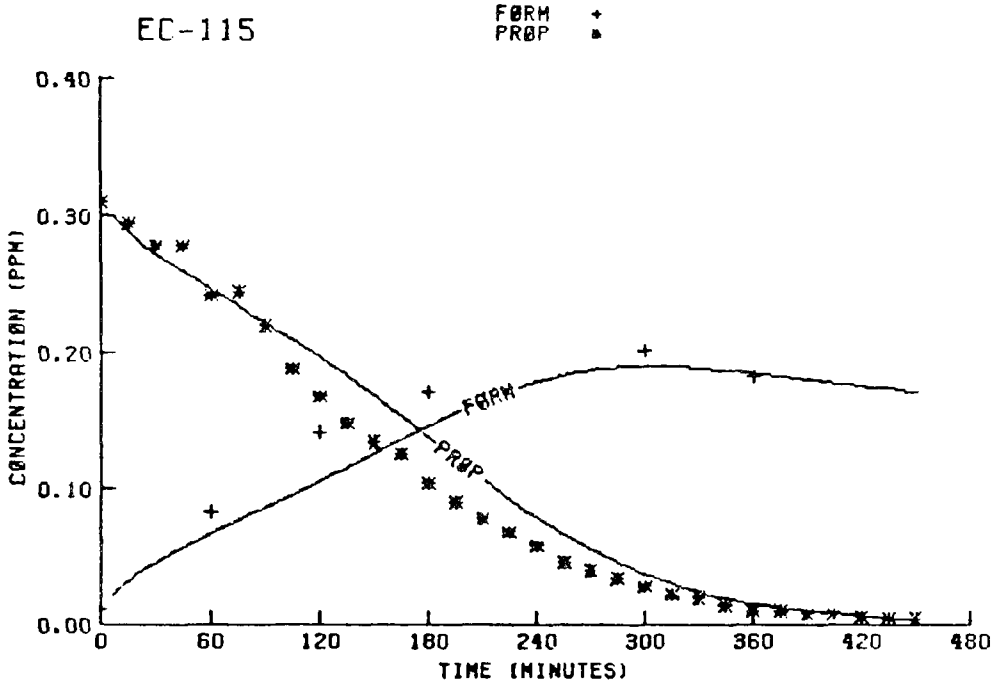

EC-114
C4N3
ALD4
0.0100
0.0075
0.0050
0.0025
0.0000
CONCENTRATION (PPM)
ALD4
C4N3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

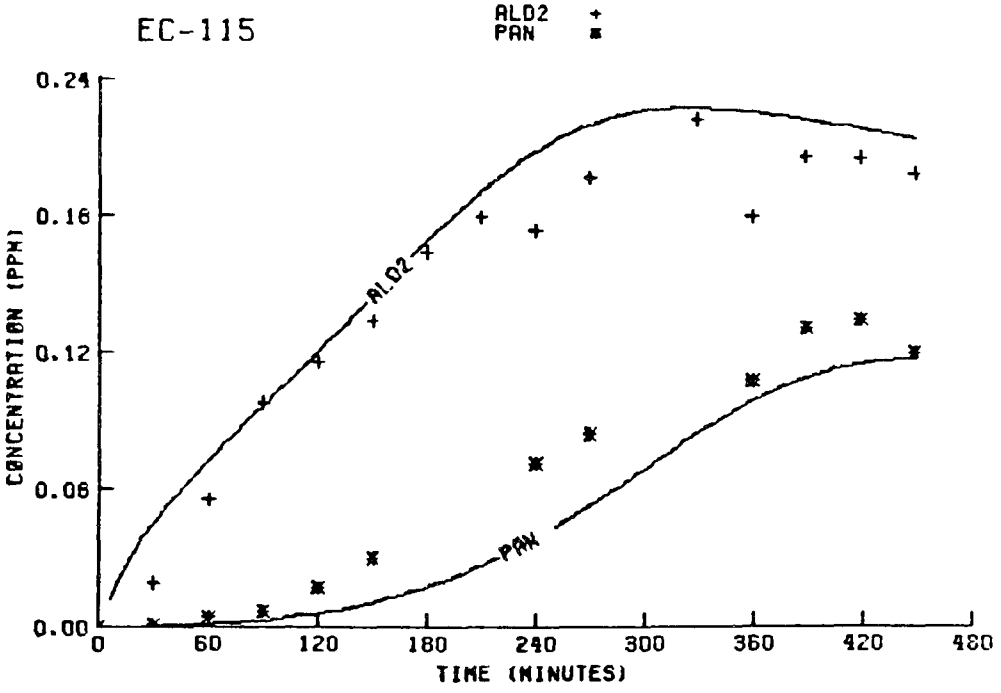

EC-114
MEN3 +
C2N3 *
0.0060
0.0045
0.0030
0.0015
0.0000
CONCENTRATION (PPM)
MEN3
C2N3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

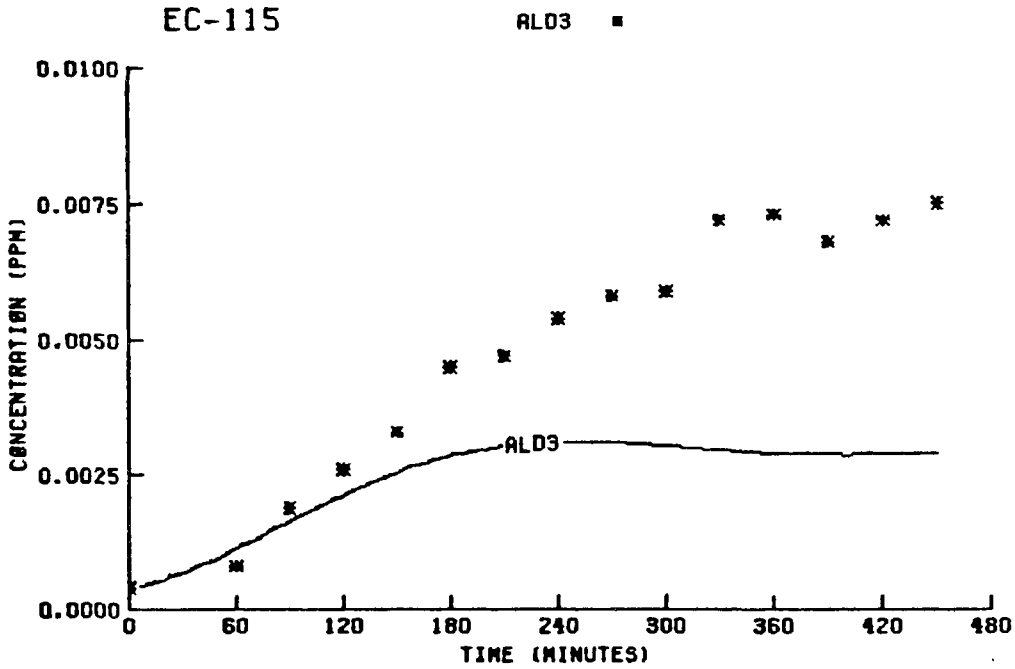

EC-114
SCN3 *
0.04
0.03
0.02
0.01
0.00
CONCENTRATION (PPM)
SCN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

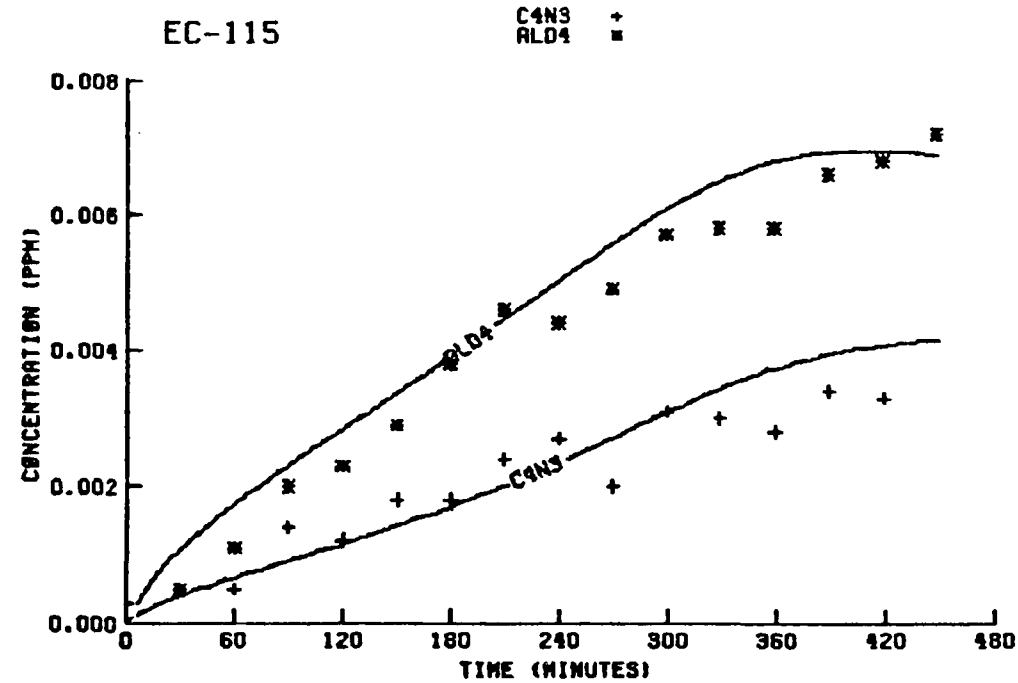

EC-115
NØ2
NØ
Ø3
0.72
0.54
0.36
0.18
0.00
CØNCENTRATIØN (PPM)
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

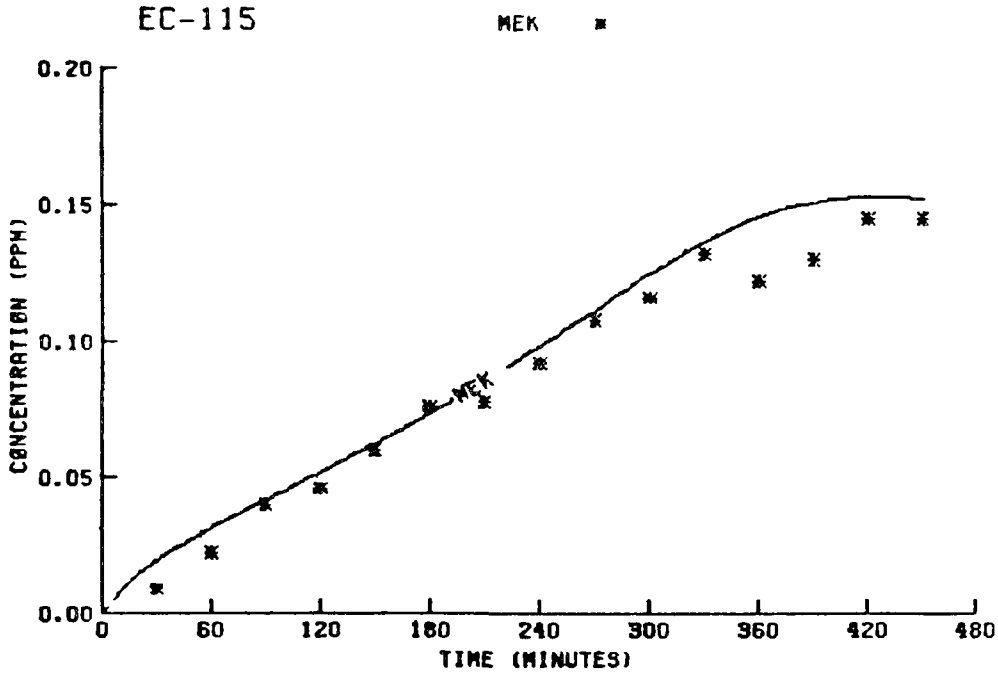

EC-115
BUT
3.00
2.75
2.50
2.25
2.00
CØNCENTRATIØN (PPM)
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

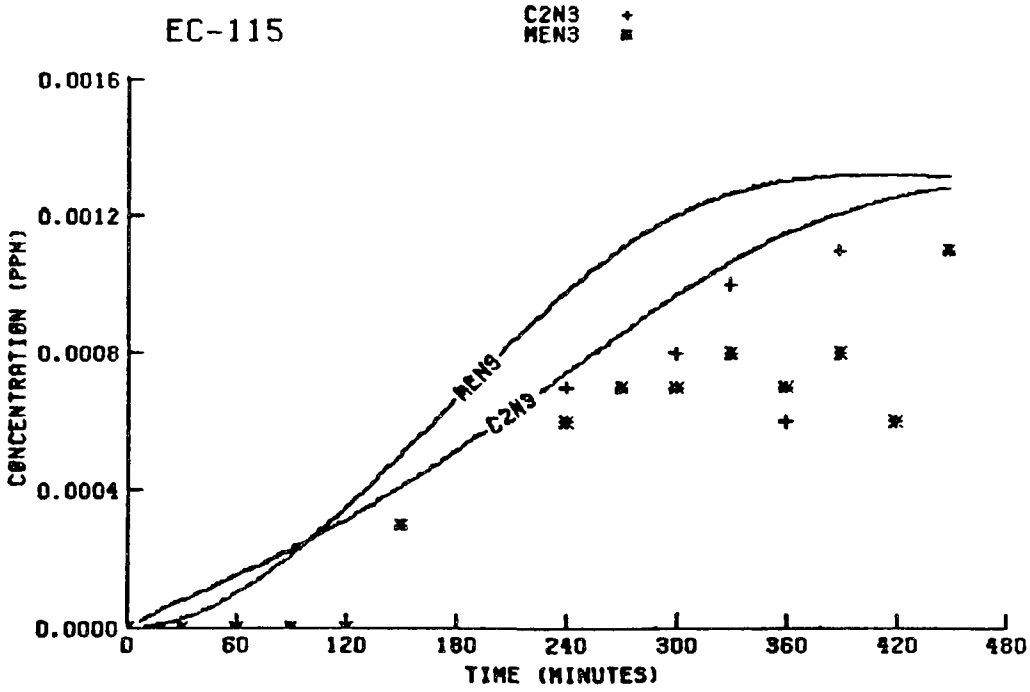

EC-115
FØRM
PRØP
0.40
0.30
0.20
0.10
0.00
CØNCENTRATIØN (PPM)
FØRM
PRØP
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

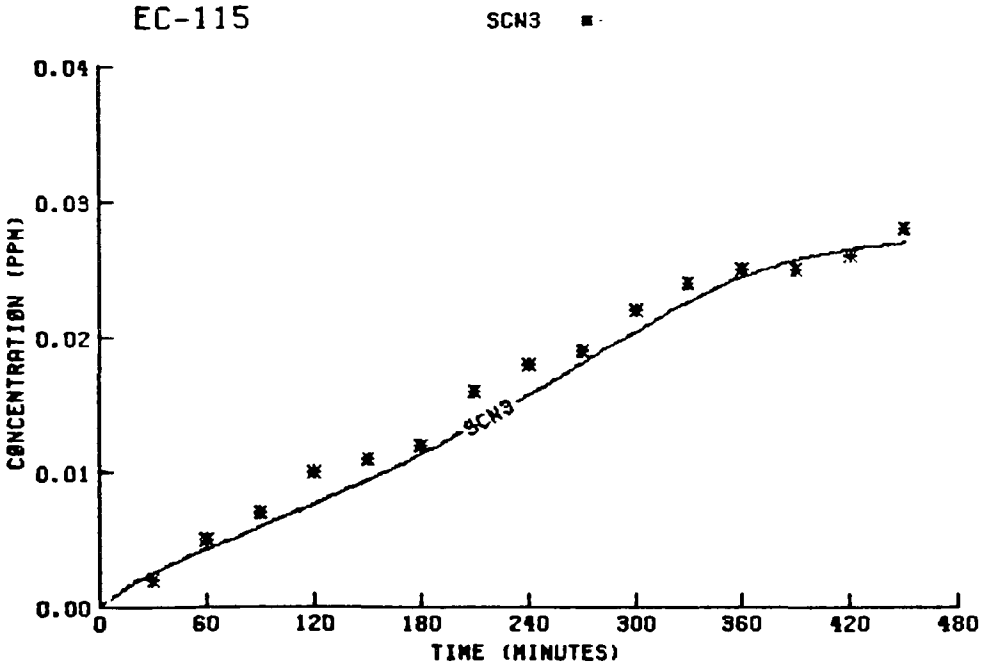

EC-115
ALD2
PAN
0.24
0.16
0.12
0.06
0.00
CØNCENTRATIØN (PPM)
ALD2
PAN
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

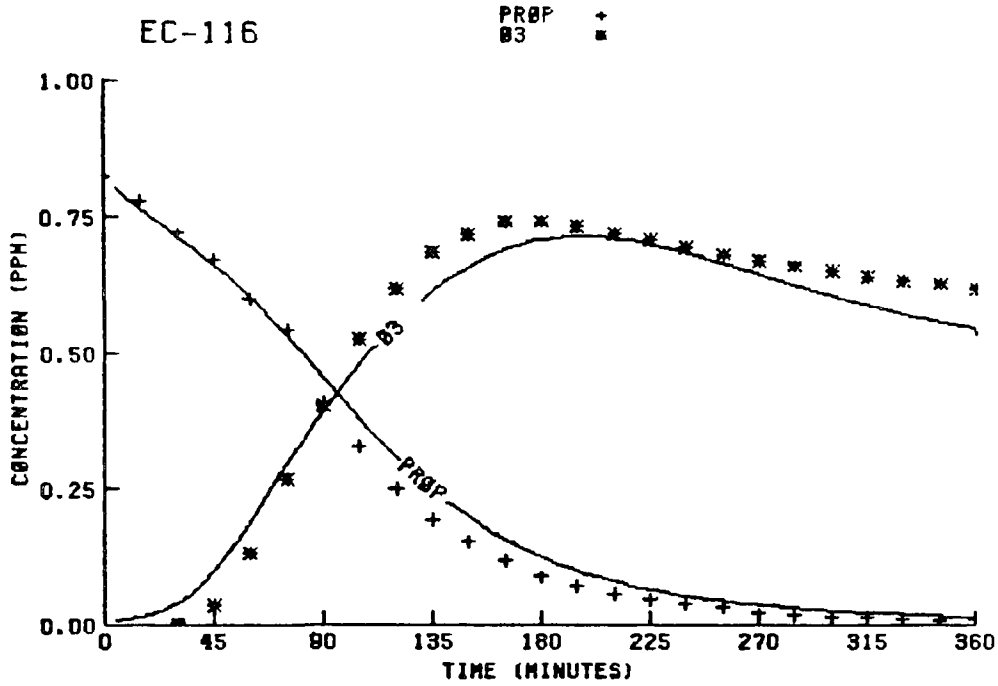

EC-115
ALD3
0.0100
0.0075
0.0050
0.0025
0.0000
CONCENTRATION (PPM)
ALD3
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

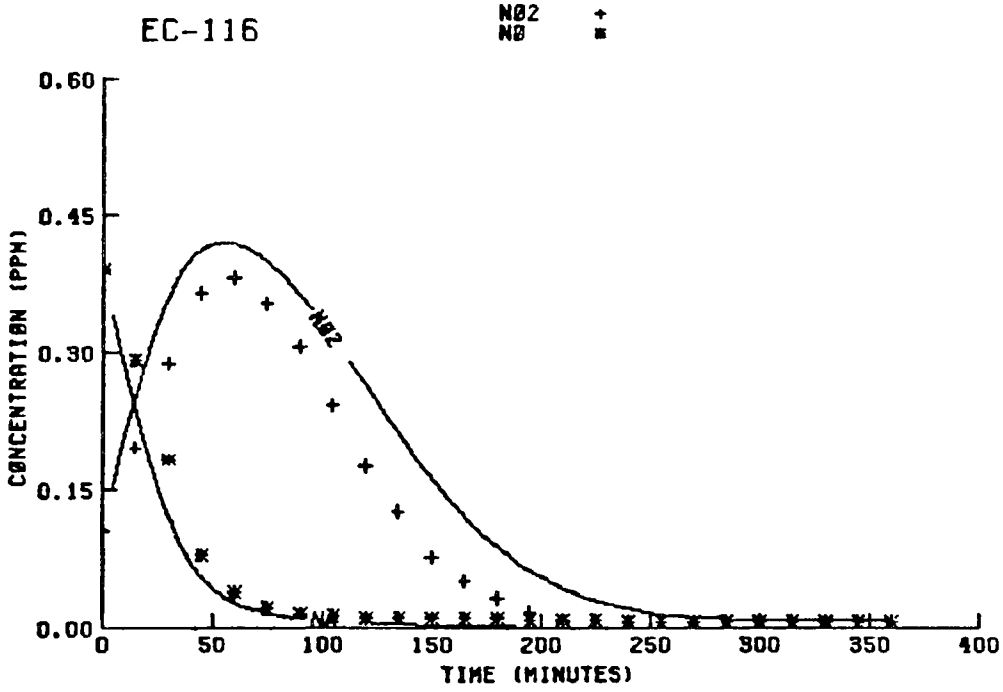

EC-115
C4N3
ALD4
0.008
0.006
0.004
0.002
0.000
CONCENTRATION (PPM)
ALD4
C4N3
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

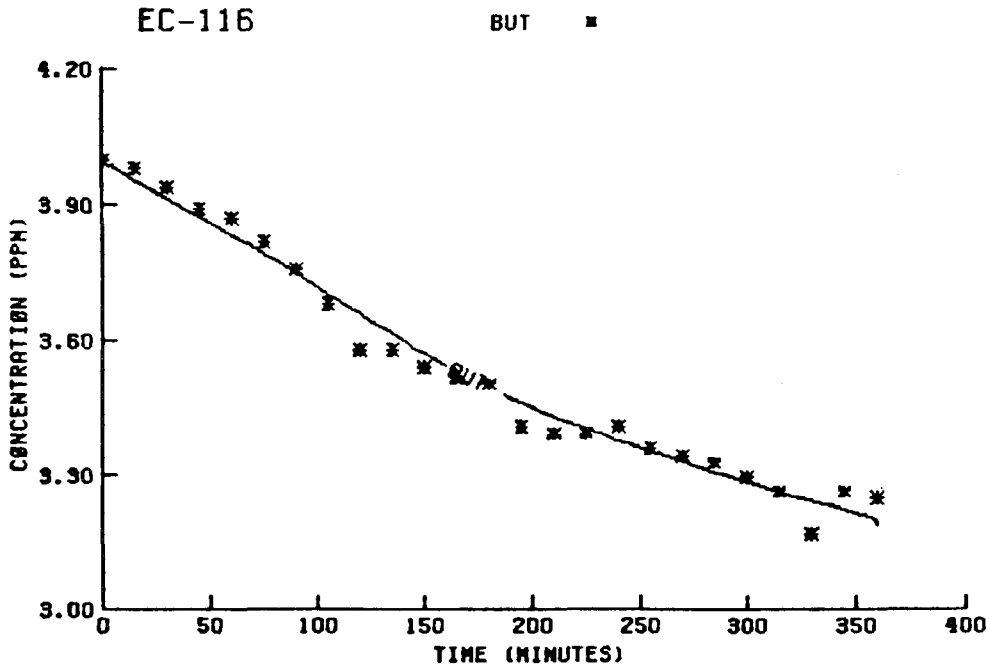

EC-115
MEK
0.20
0.15
0.10
0.05
0.00
CONCENTRATION (PPM)
MEK
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

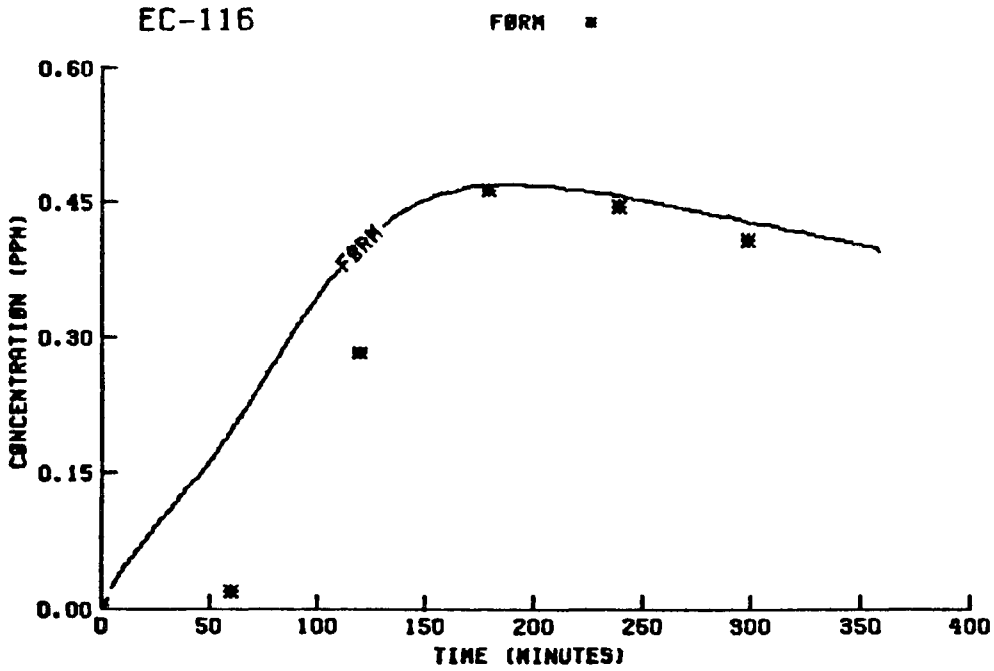

EC-115
C2N3
MEN3
0.0016
0.0012
0.0008
0.0004
0.0000
CONCENTRATION (PPM)
MEN3
C2N3
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

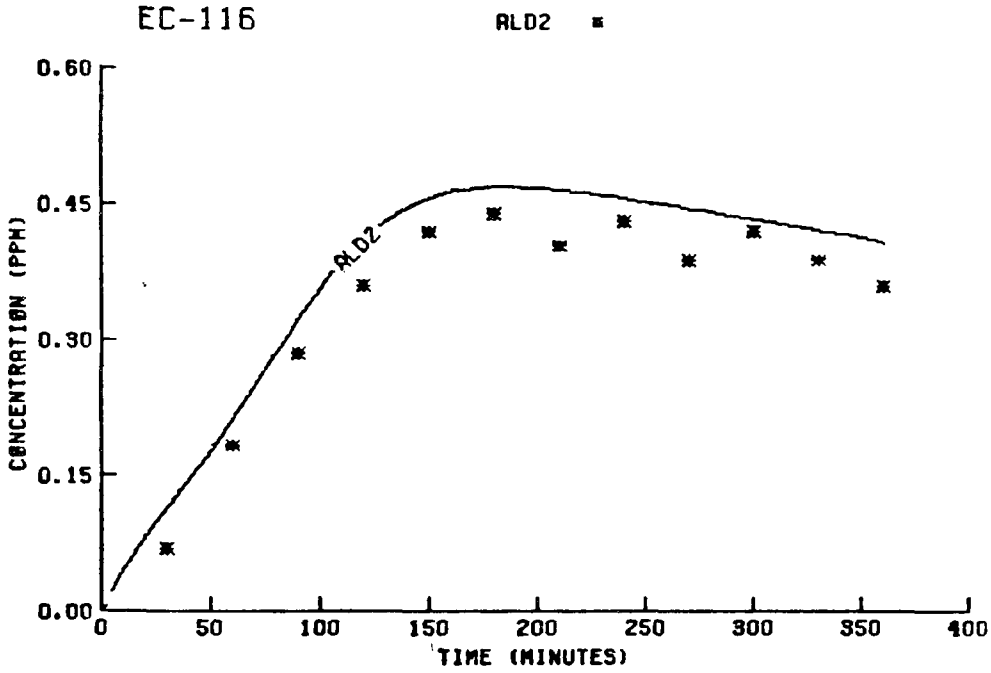

EC-115
SCN3
0.04
0.03
0.02
0.01
0.00
CONCENTRATION (PPM)
SCN3
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

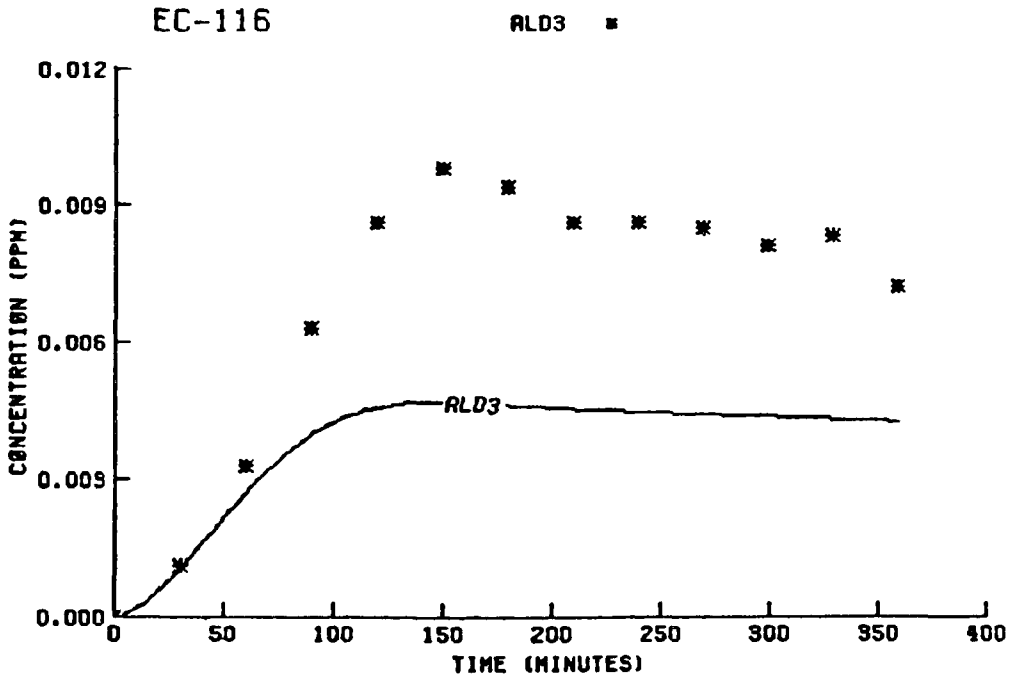

EC-116
PRØP +
Ø3 *
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPH)
Ø3
PRØP
0
45
90
135
180
225
270
315
360
TIME (MINUTES)

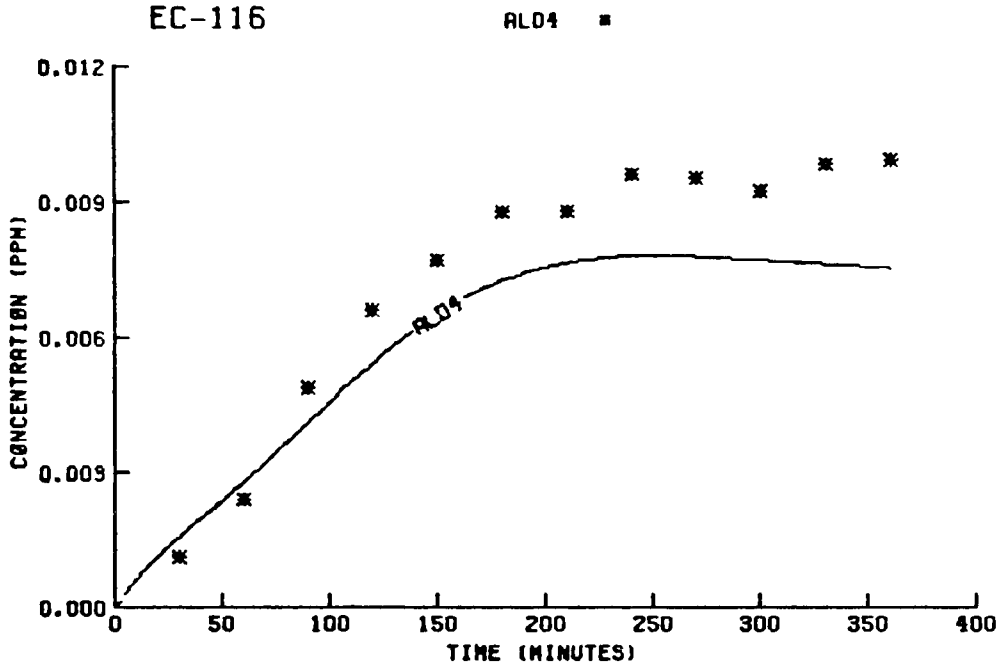

EC-116
NØ2 +
NØ *
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPH)
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

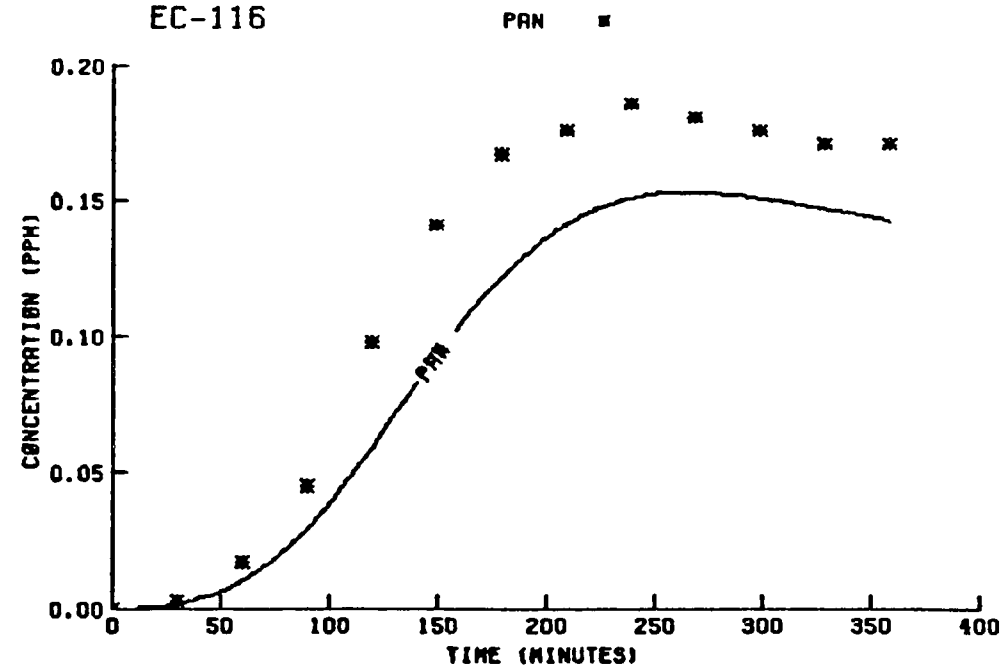

EC-116
BUT
4.20
3.90
3.60
3.30
3.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

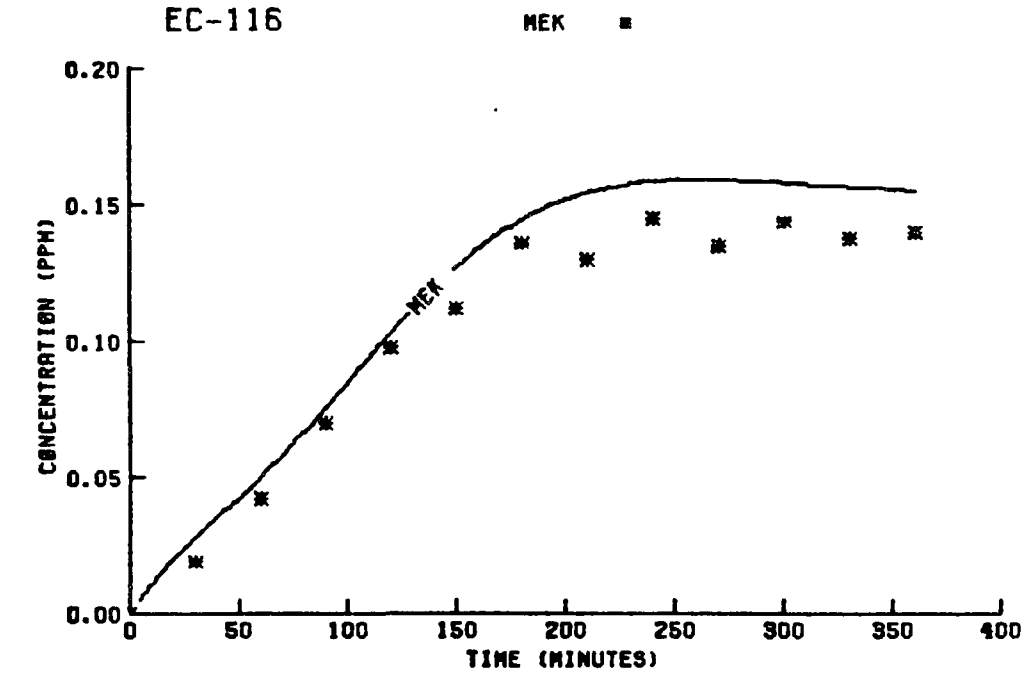

EC-116
FORM
0.60
0.45
0.30
0.15
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

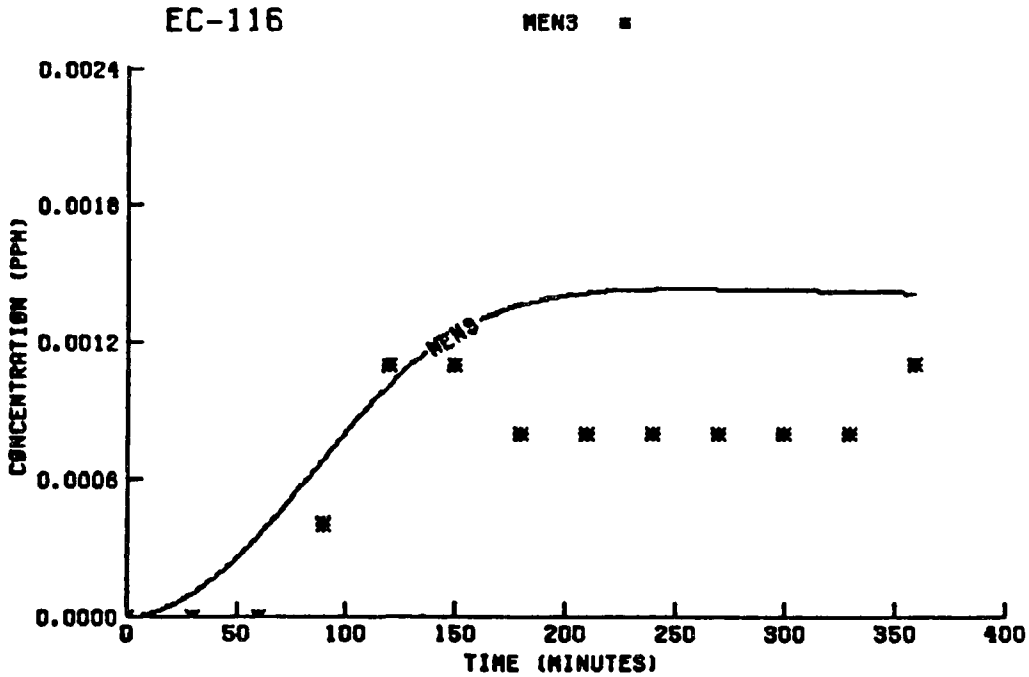

EC-116
RLD2
0.60
0.45
0.30
0.15
0.00
CONCENTRATION (PPM)
RLD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

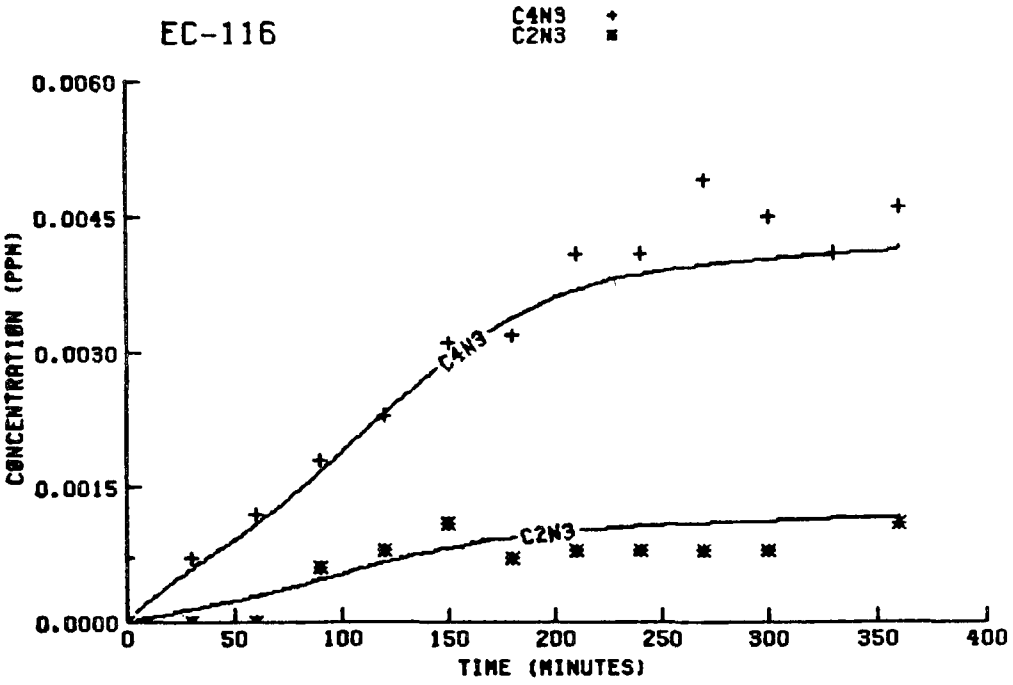

EC-116
RLD3
0.012
0.009
0.006
0.003
0.000
CONCENTRATION (PPM)
RLD3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

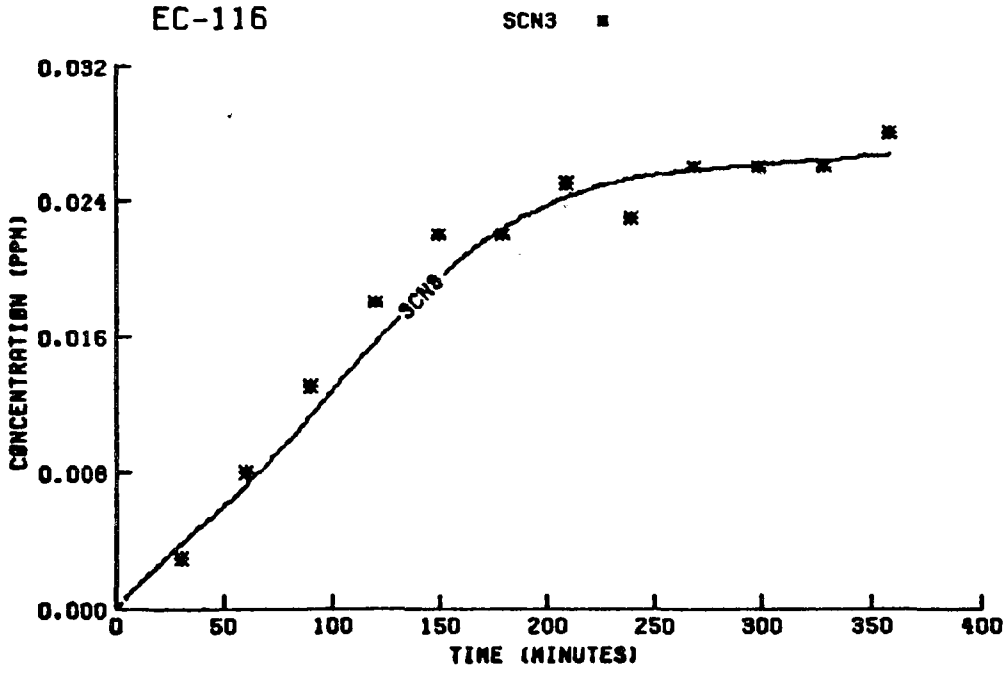

EC-116
ALD4
0.012
0.009
0.006
0.003
0.000
CONCENTRATION (PPM)
ALD4
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-116
PAN
0.20
0.15
0.10
0.05
0.00
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

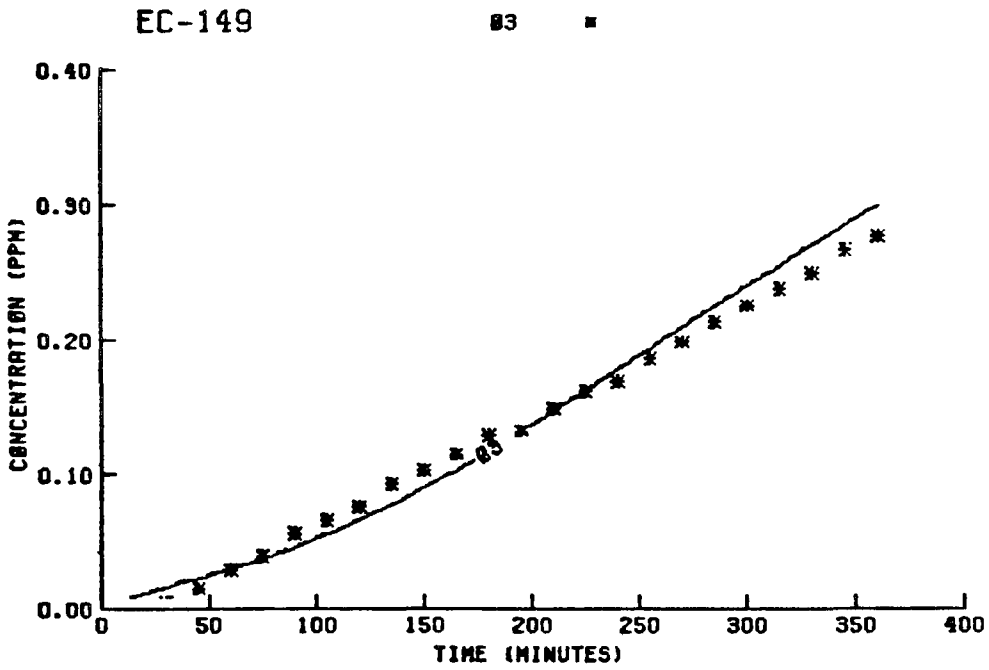

EC-116
MEK
0.20
0.15
0.10
0.05
0.00
CONCENTRATION (PPM)
MEK
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

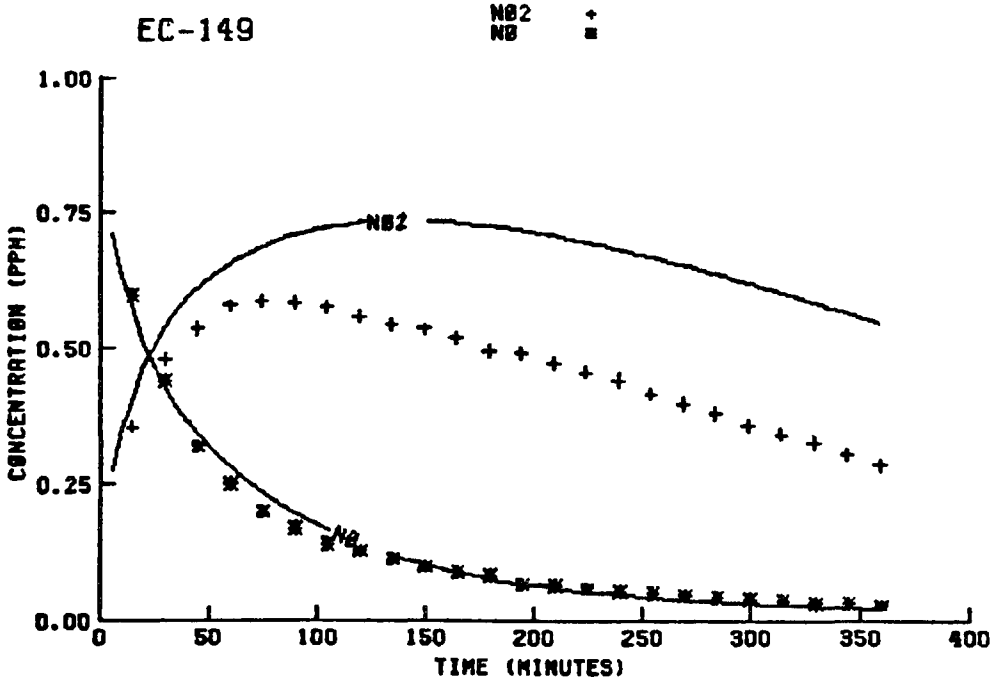

EC-116
MEN3
0.0024
0.0018
0.0012
0.0006
0.0000
CONCENTRATION (PPM)
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

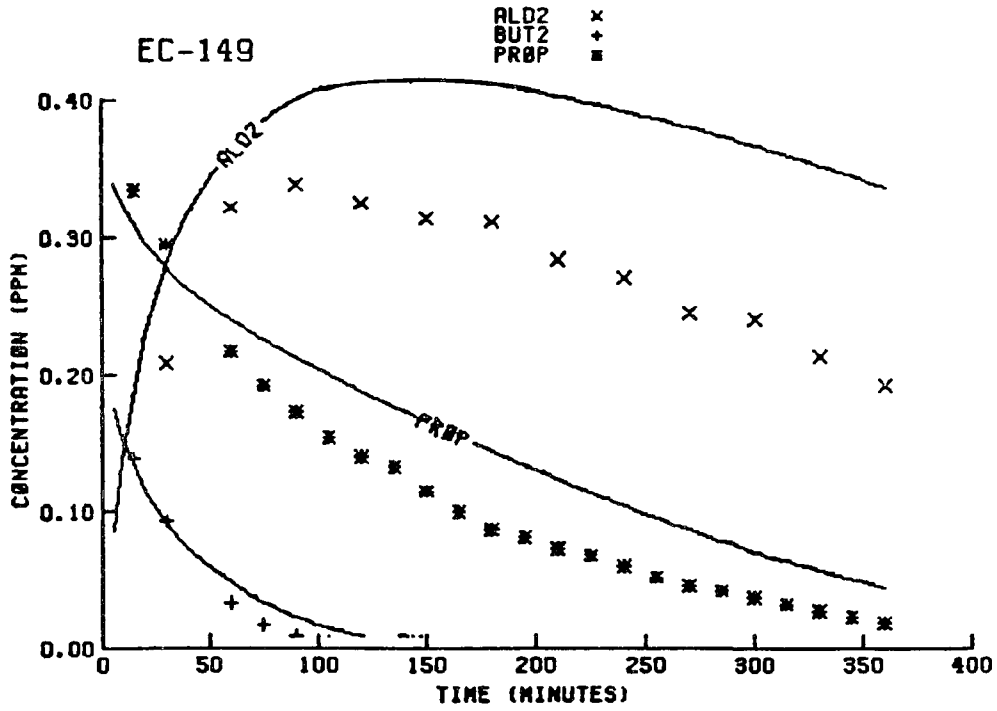

EC-116
C4N3 +
C2N3 ■
0.0060
0.0045
0.0030
0.0015
0.0000
CONCENTRATION (PPM)
C4N3
C2N3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

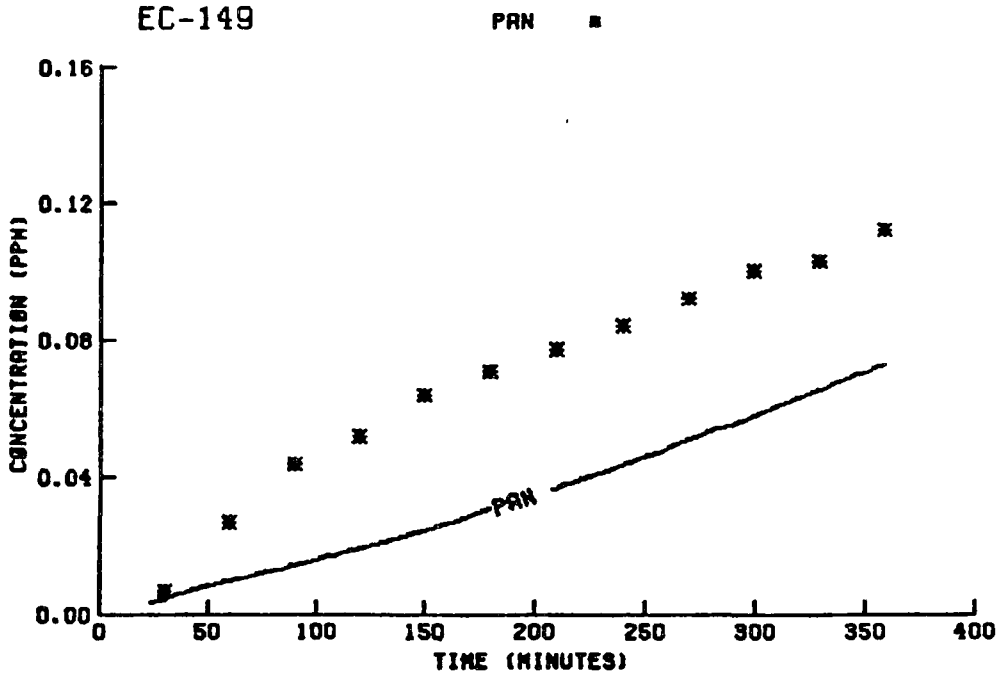

EC-116
SCN3 ■
0.032
0.024
0.016
0.008
0.000
CONCENTRATION (PPM)
SCN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

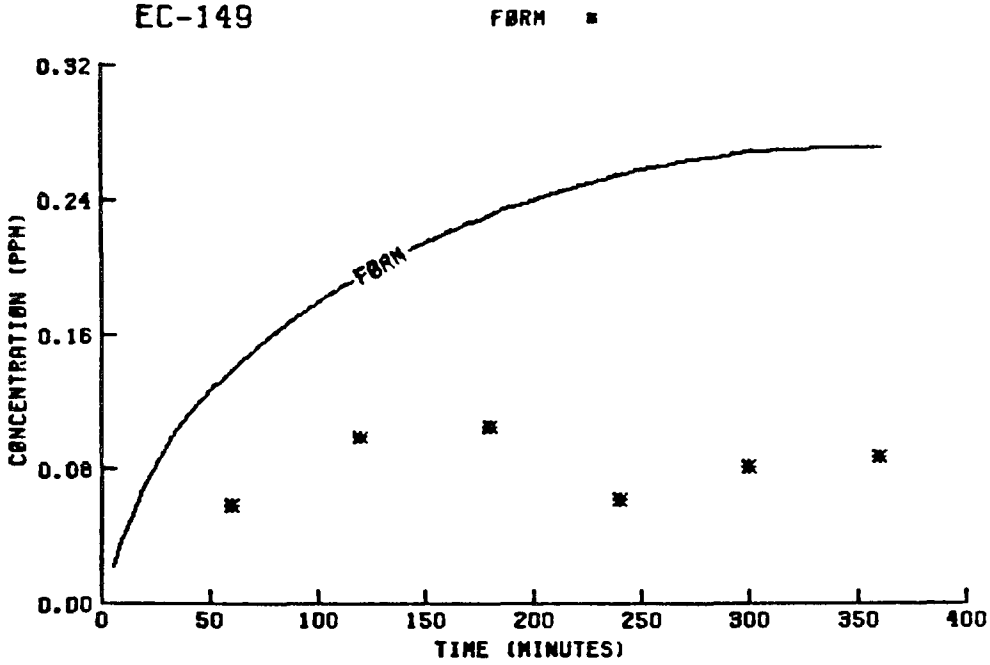
UCR PROPYLENE/TRANS-2-BUTENE EXPERIMENT

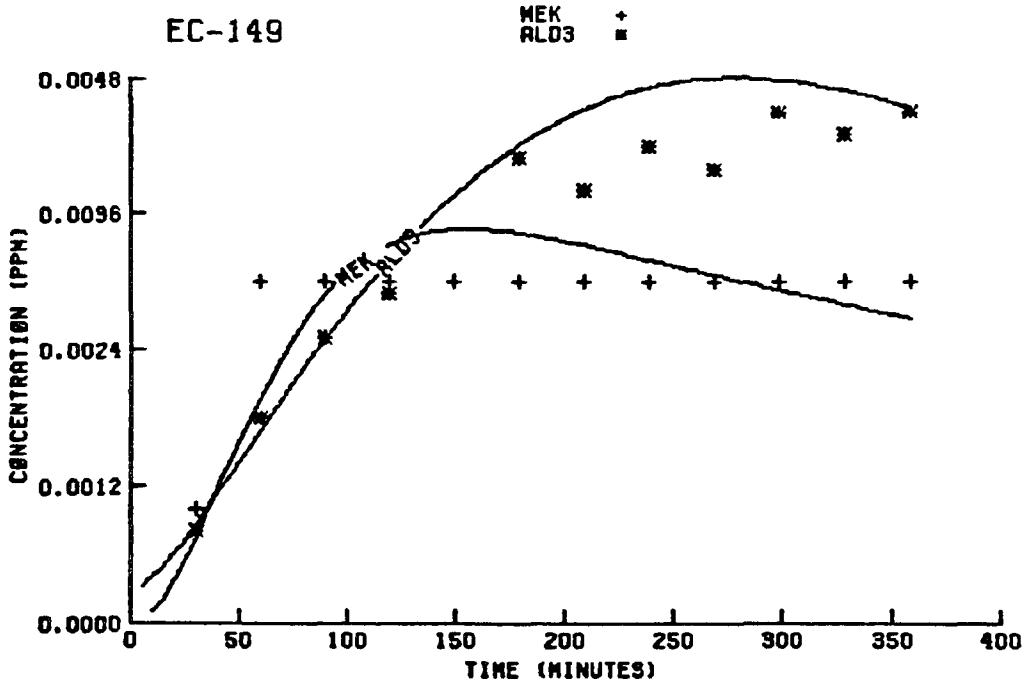

EC-149
O3
0.40
0.30
0.20
0.10
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

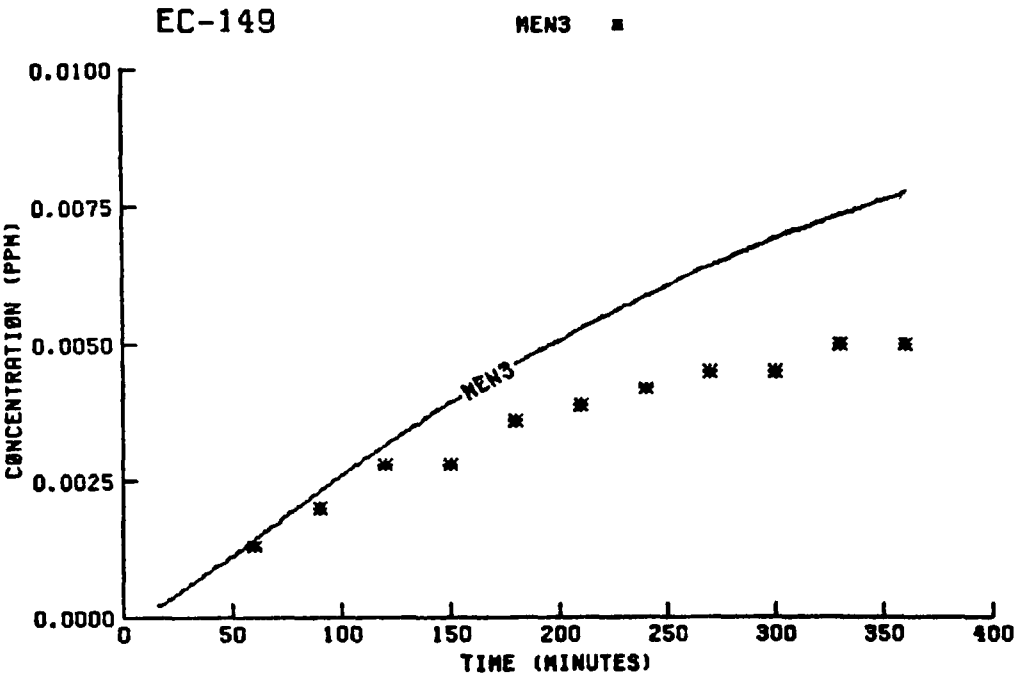

EC-149
NO2
NO
1.00
0.75
0.50
0.25
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-149
ALD2 ×
BUT2 +
PR0P ■
0.40
0.30
0.20
0.10
0.00
CONCENTRATION (PPM)
ALD2
PR0P
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

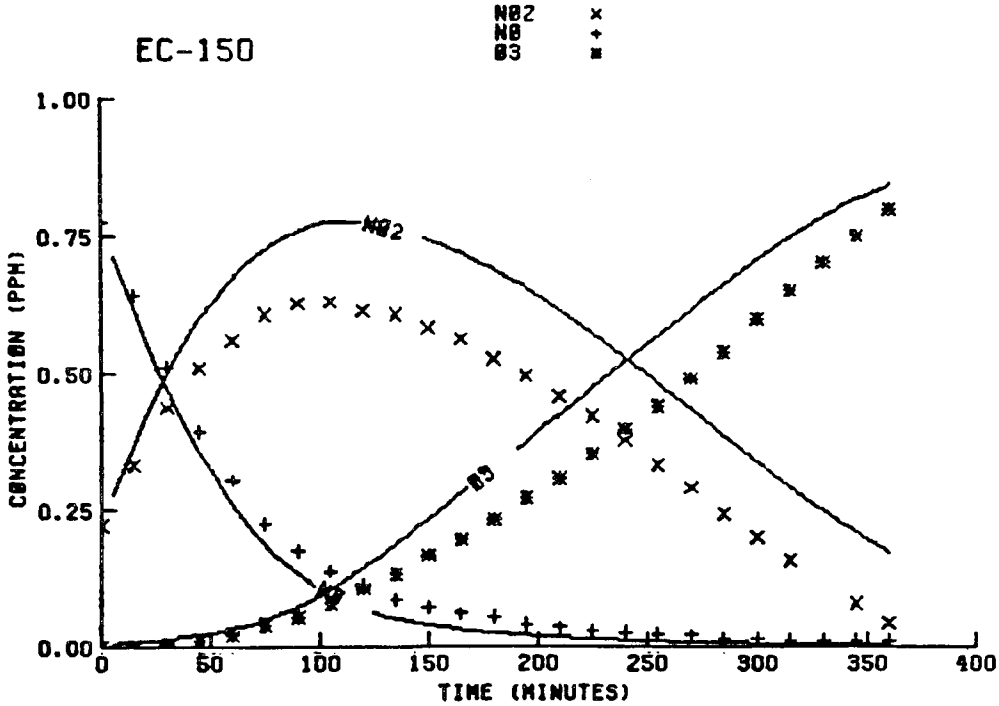

EC-149
PAN ■
0.16
0.12
0.08
0.04
0.00
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

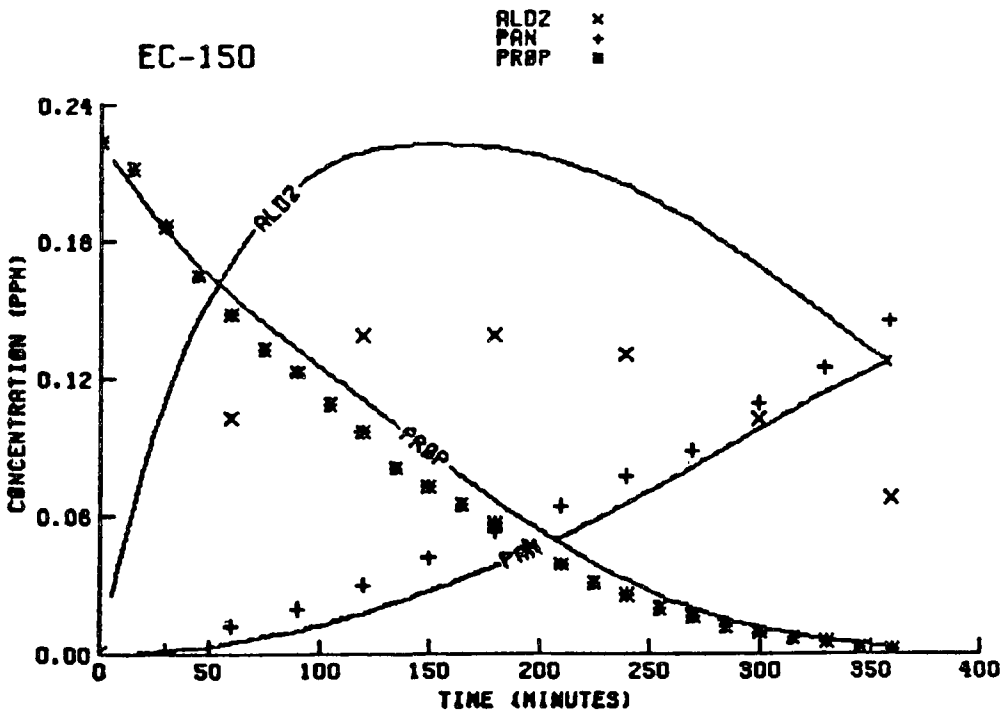

EC-149
FORM
0.32
0.24
0.16
0.08
0.00
CONCENTRATION (PPM)
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

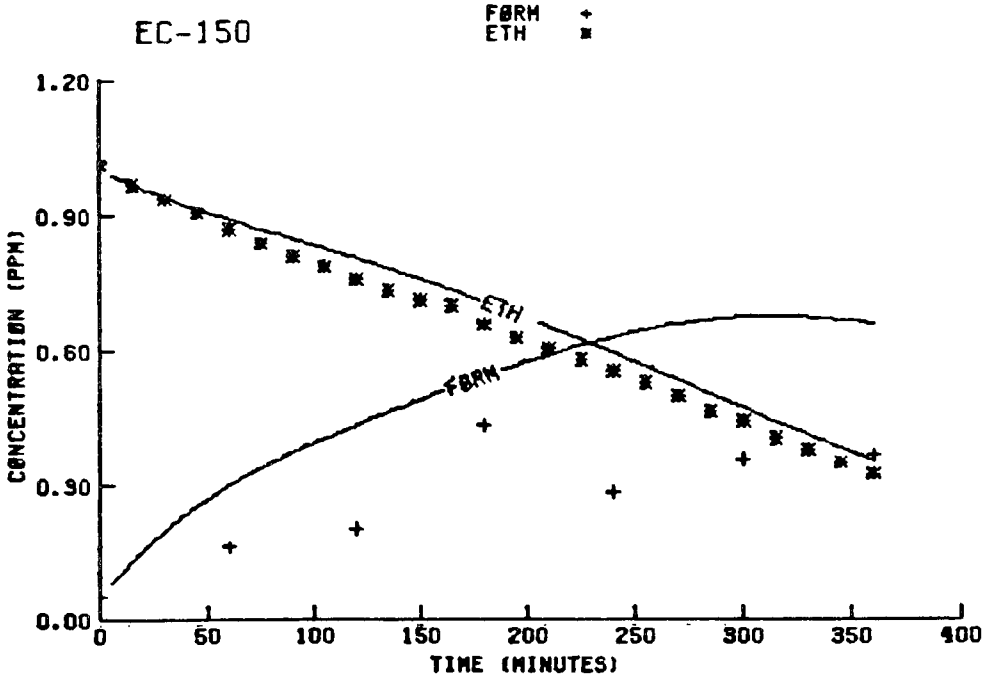

EC-149
MEK
ALD3
0.0048
0.0096
0.0024
0.0012
0.0000
CONCENTRATION (PPM)
MEK
ALD3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

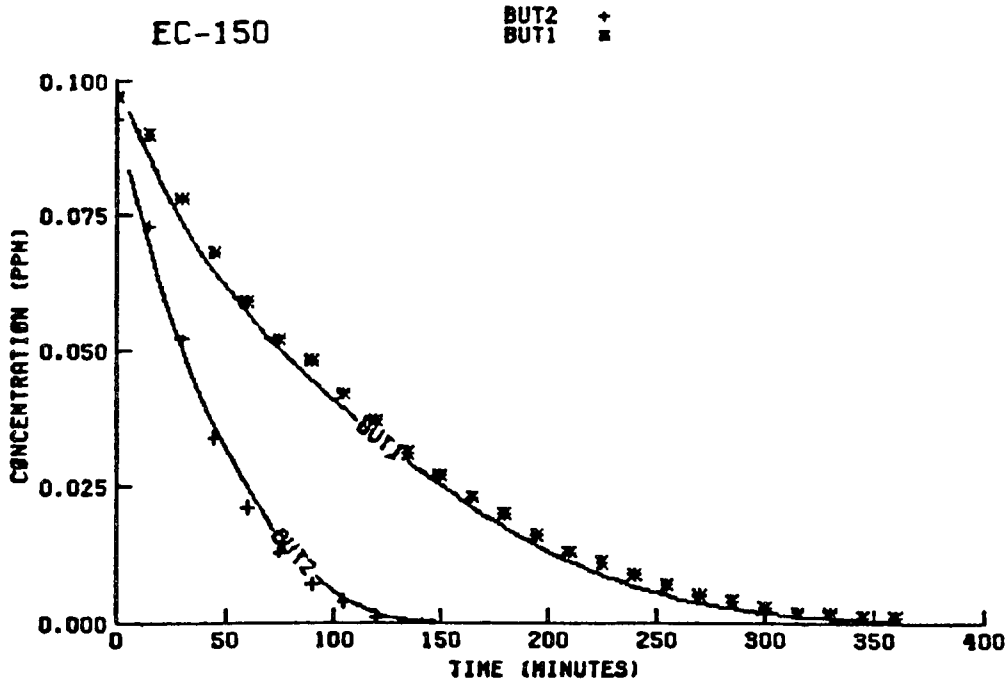

EC-149
MEN3
0.0100
0.0075
0.0050
0.0025
0.0000
CONCENTRATION (PPM)
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

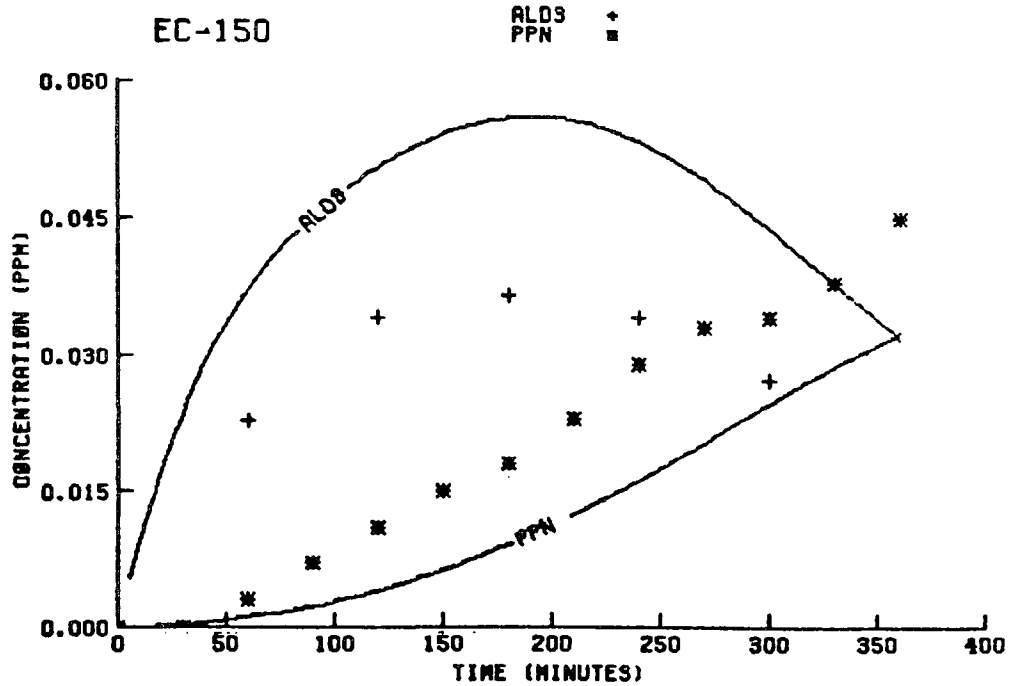
UCR MULTIOLEFIN EXPERIMENTS

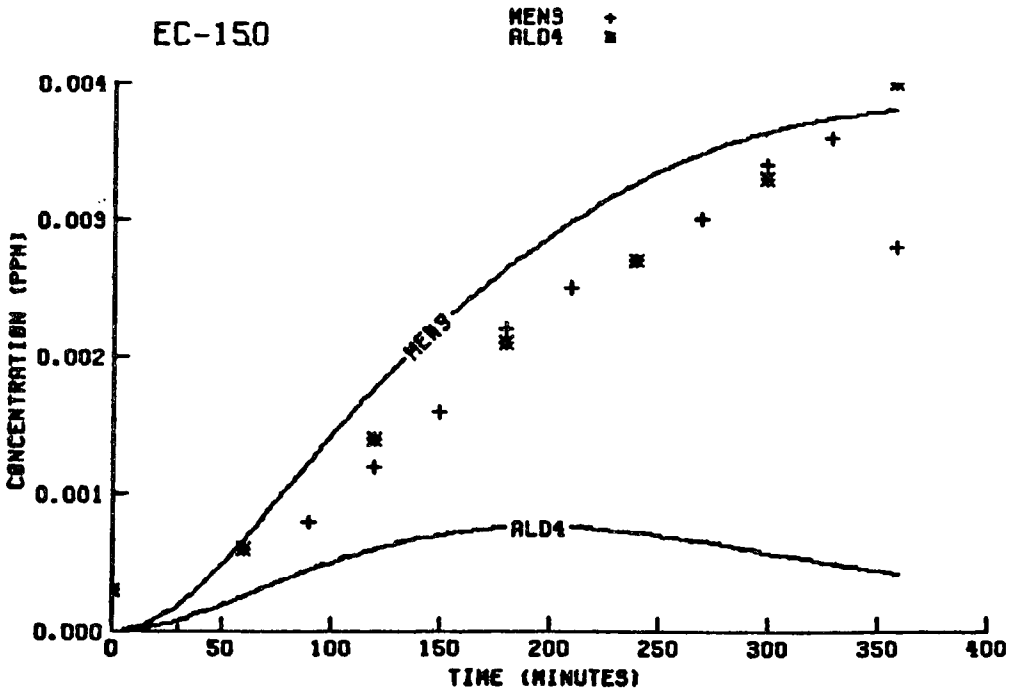

EC-150
NO2
NO
O3
1.00
0.75
0.50
0.25
0.00
CONCENTRATION (PPM)
NO2
O3
NO
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

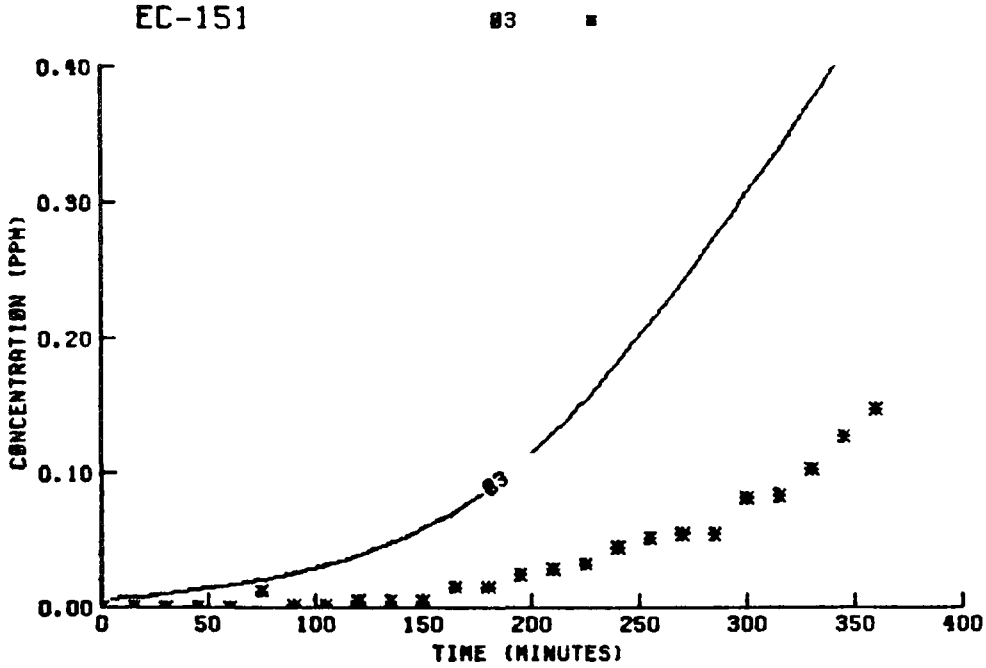

EC-150
ALD2
PAN
PROP
0.24
0.18
0.12
0.06
0.00
CONCENTRATION (PPM)
ALD2
PROP
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

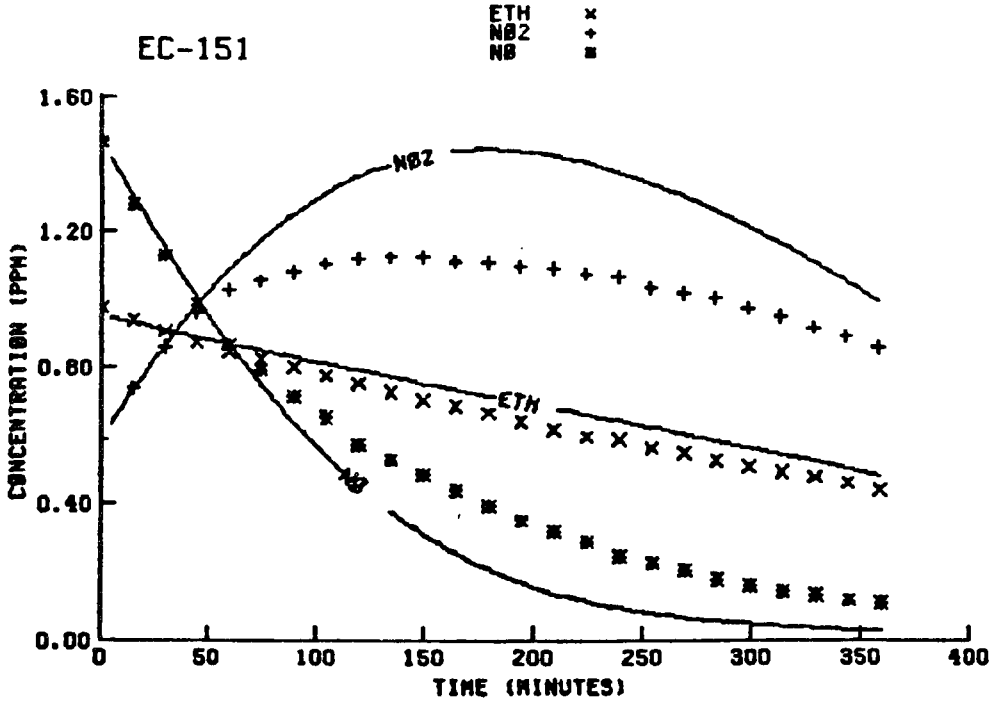

EC-150
FORM +
ETH *
1.20
0.90
0.60
0.30
0.00
CONCENTRATION (PPM)
ETH
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

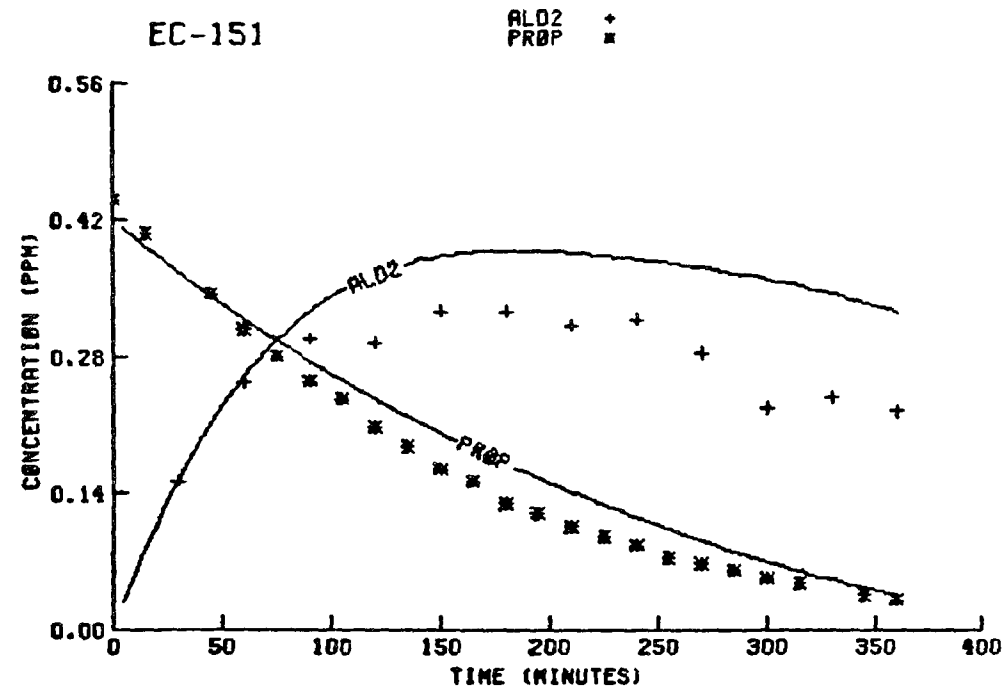

EC-150
BUT2 +
BUT1 *
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
BUT1
BUT2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

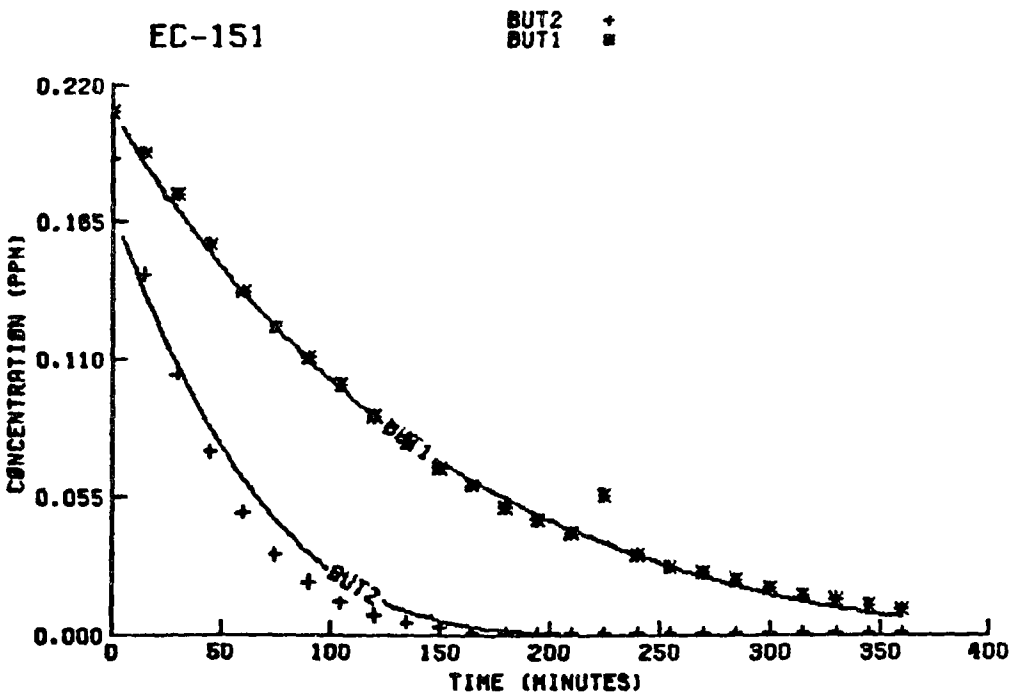

EC-150
ALD3
PPN
0.060
0.045
0.030
0.015
0.000
CONCENTRATION (PPM)
ALD3
PPN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

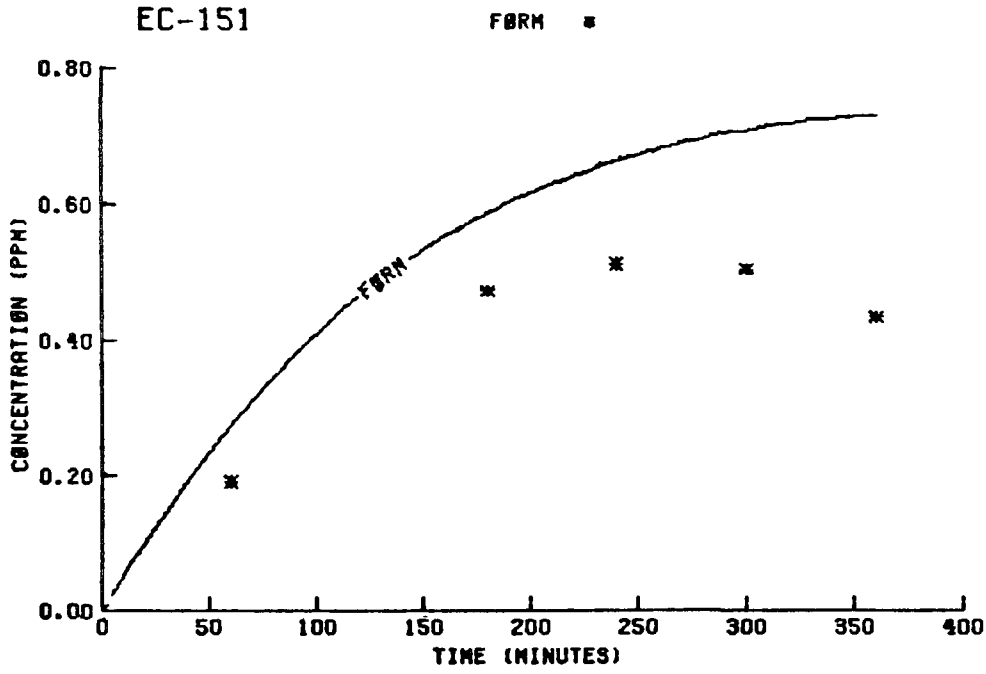

EC-150
MEN3
ALD4
0.004
0.003
0.002
0.001
0.000
CONCENTRATION (PPM)
MEN3
ALD4
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

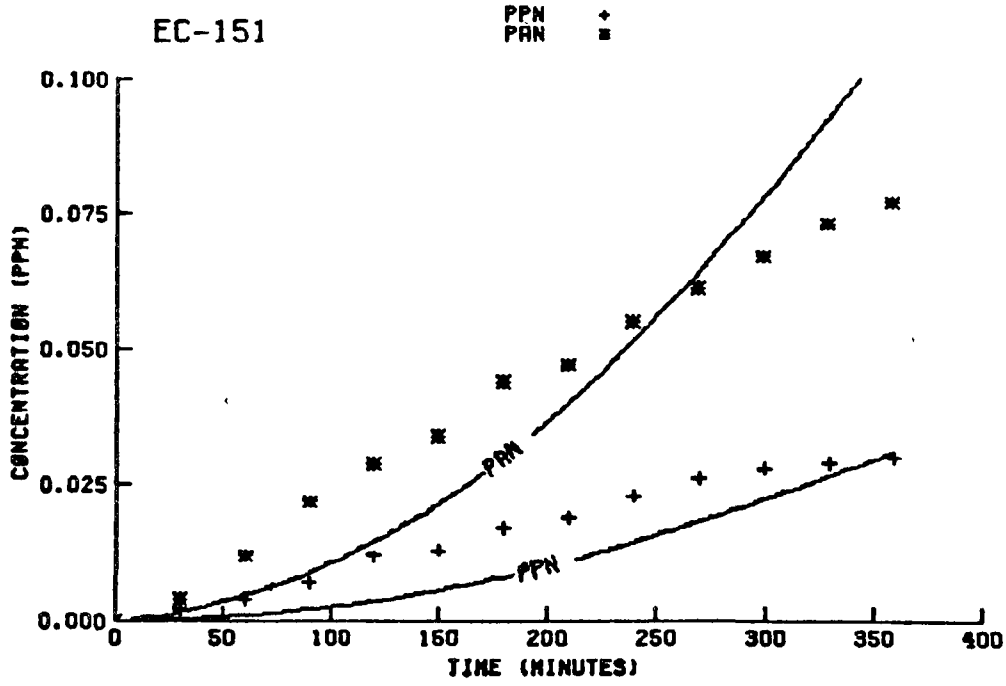

EC-151
O3
0.40
0.30
0.20
0.10
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

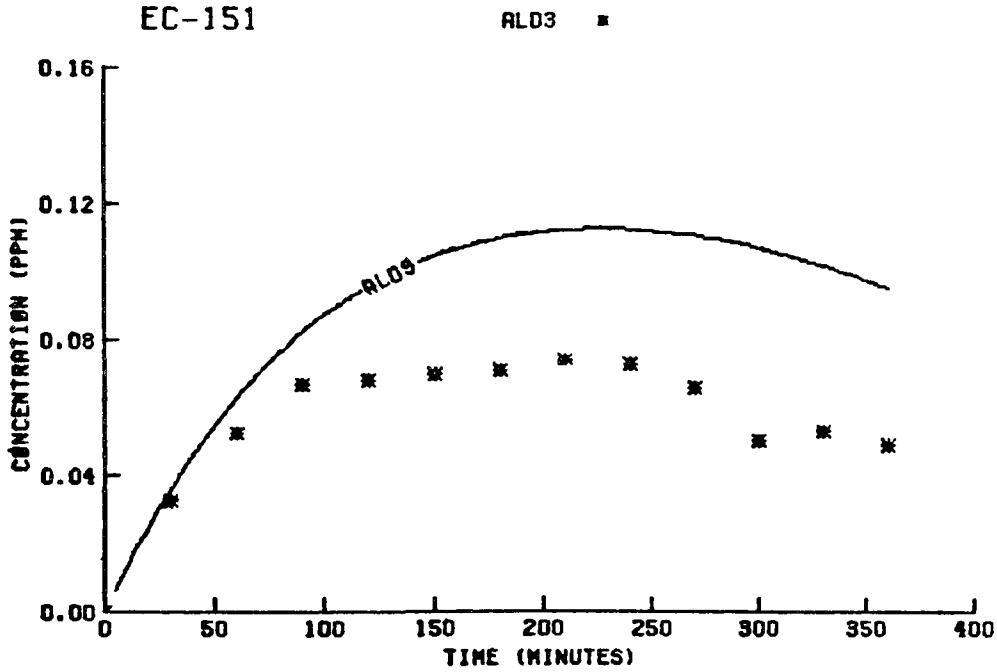

ETH
NO2
NO
EC-151
1.60
1.20
0.80
0.40
0.00
CONCENTRATION (PPM)
NO2
ETH
NO
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

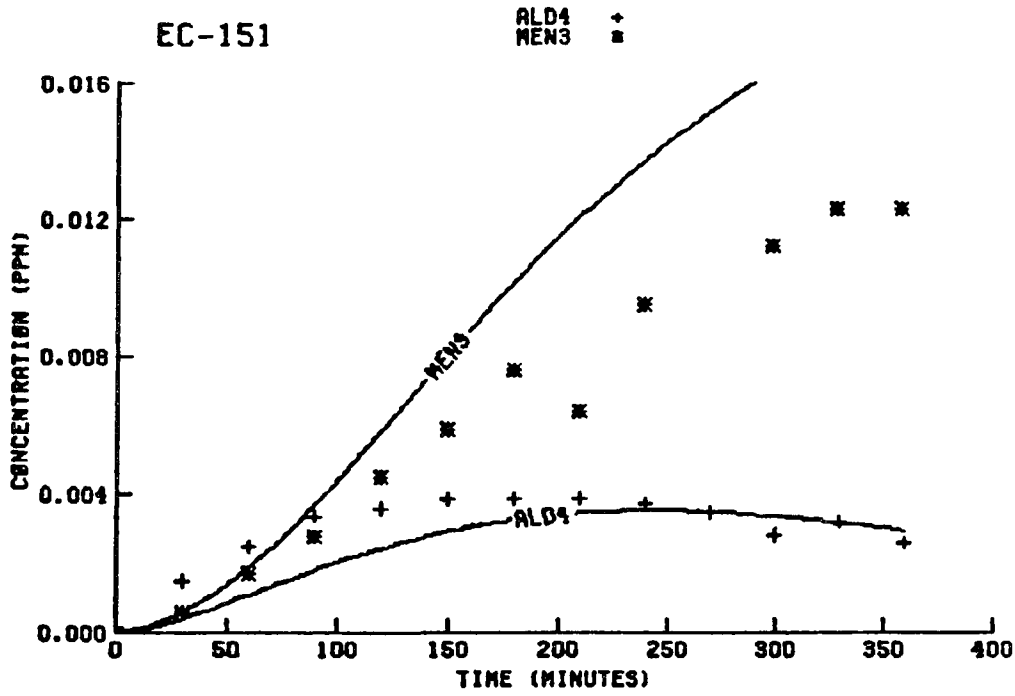

EC-151
ALD2
PROP
0.56
0.42
0.28
0.14
0.00
CONCENTRATION (PPM)
ALD2
PROP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

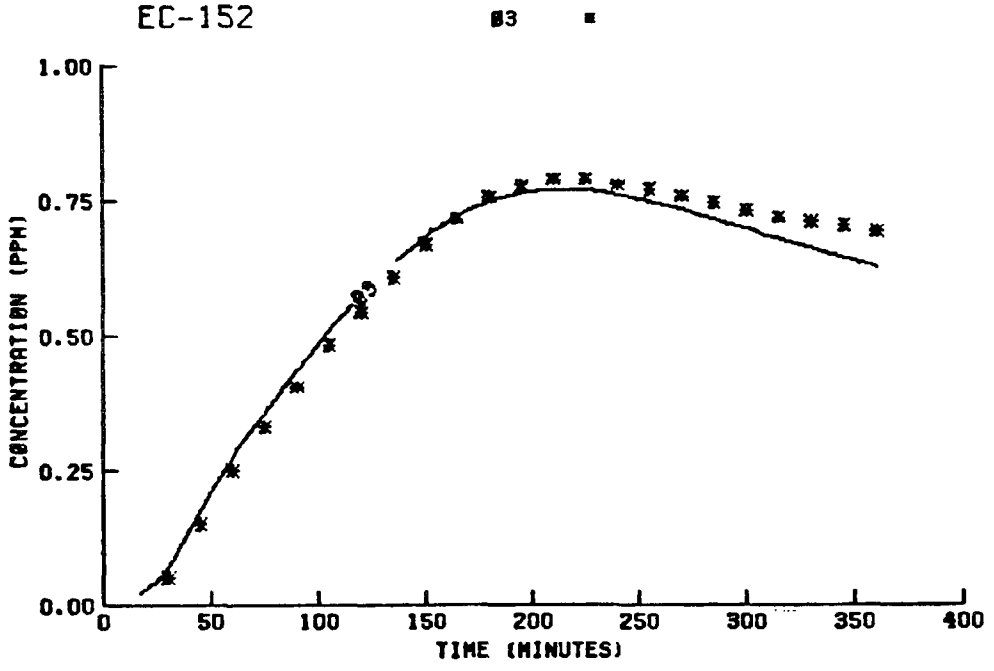

EC-151
BUT2
BUT1
0.220
0.165
0.110
0.055
0.000
CONCENTRATION (PPM)
BUT1
BUT2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

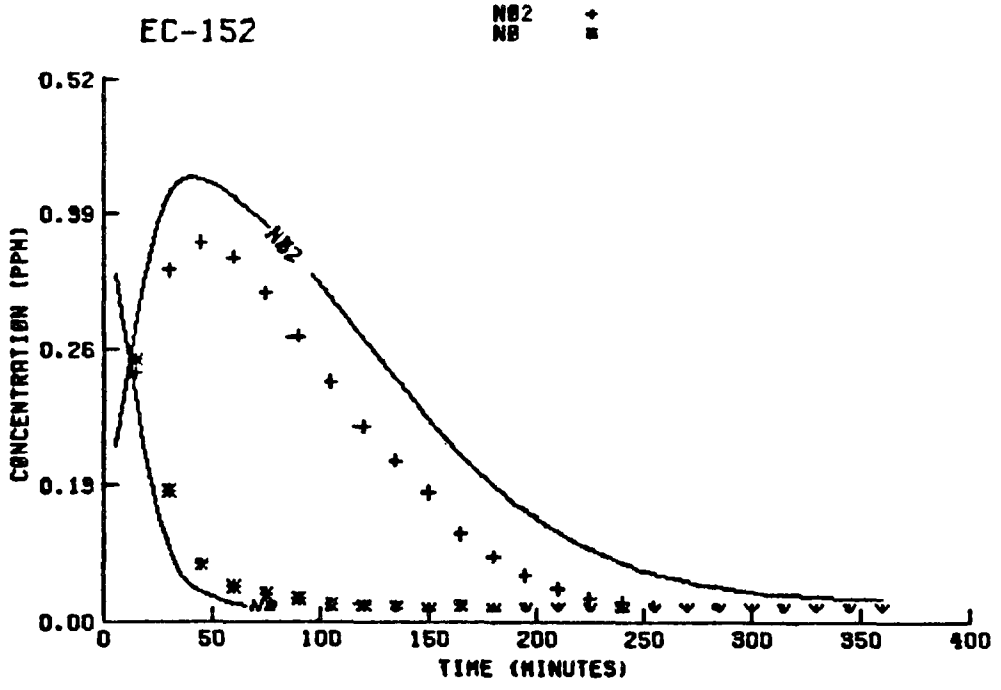

EC-151
FORM
0.80
0.60
0.40
0.20
0.00
CONCENTRATION (PPM)
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

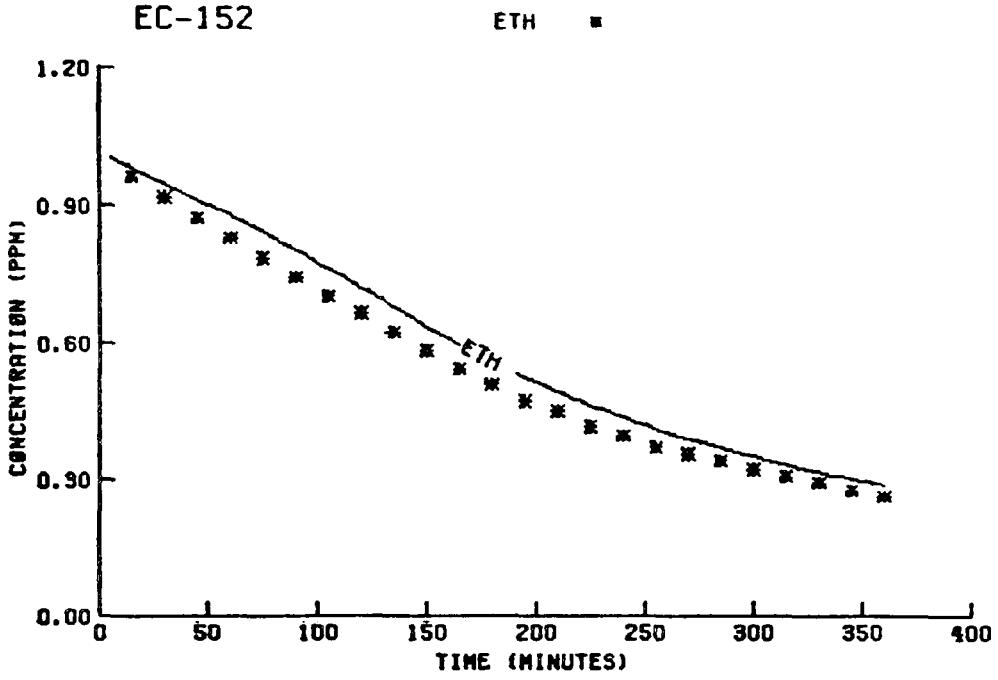

EC-151
PPN
PAN
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
PAN
PPN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

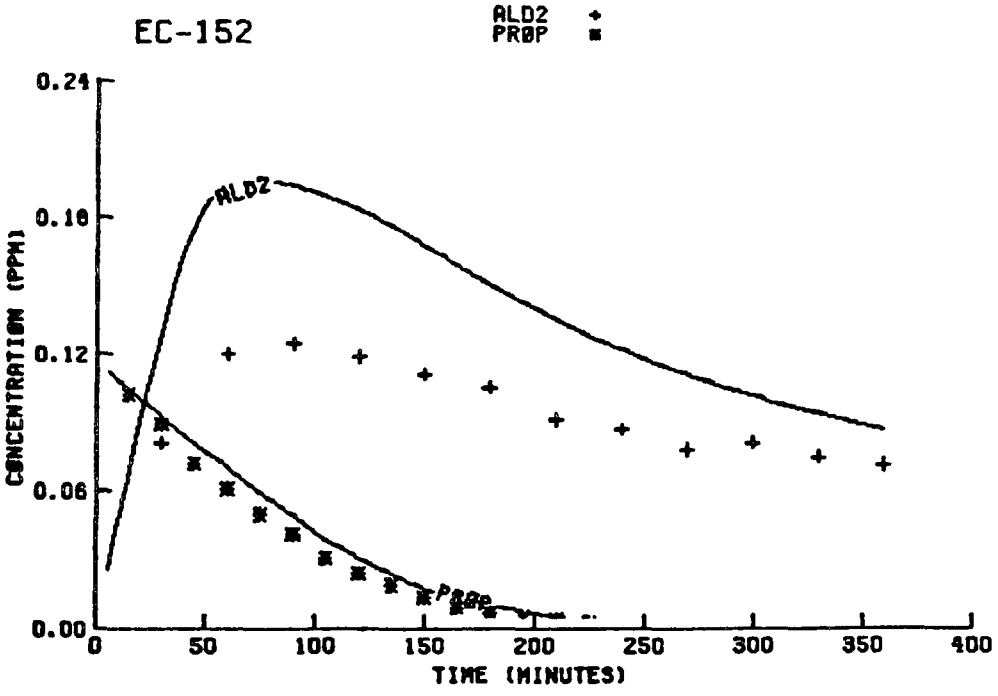

EC-151
ALD3
0.16
0.12
0.08
0.04
0.00
CONCENTRATION (PPM)
ALD3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

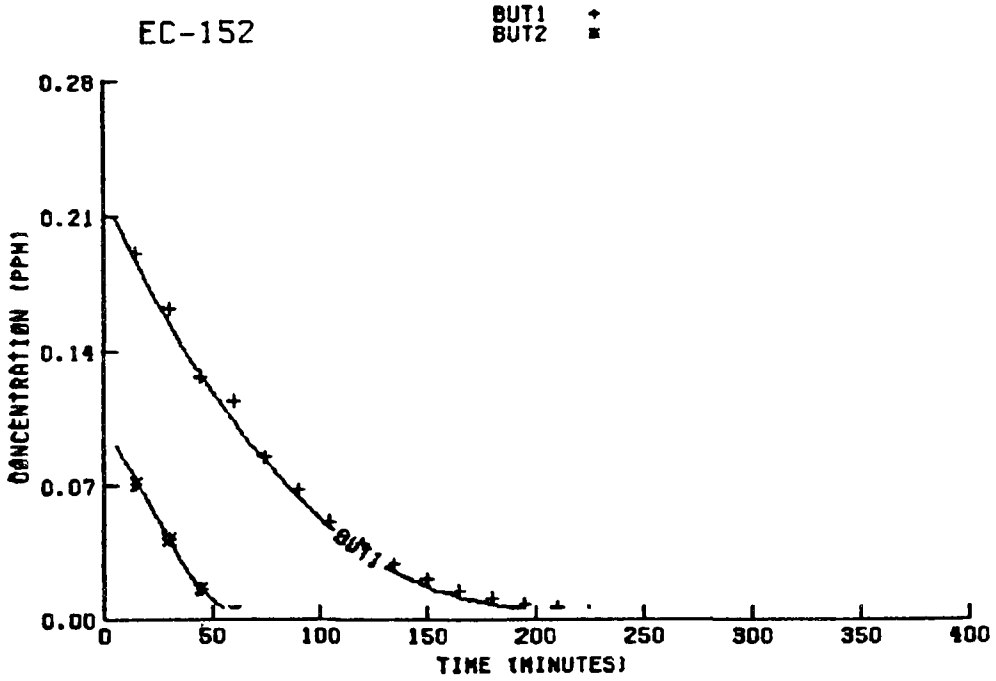

EC-151
ALD4
MEN3
0.016
0.012
0.008
0.004
0.000
CONCENTRATION (PPM)
MEN3
ALD4
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

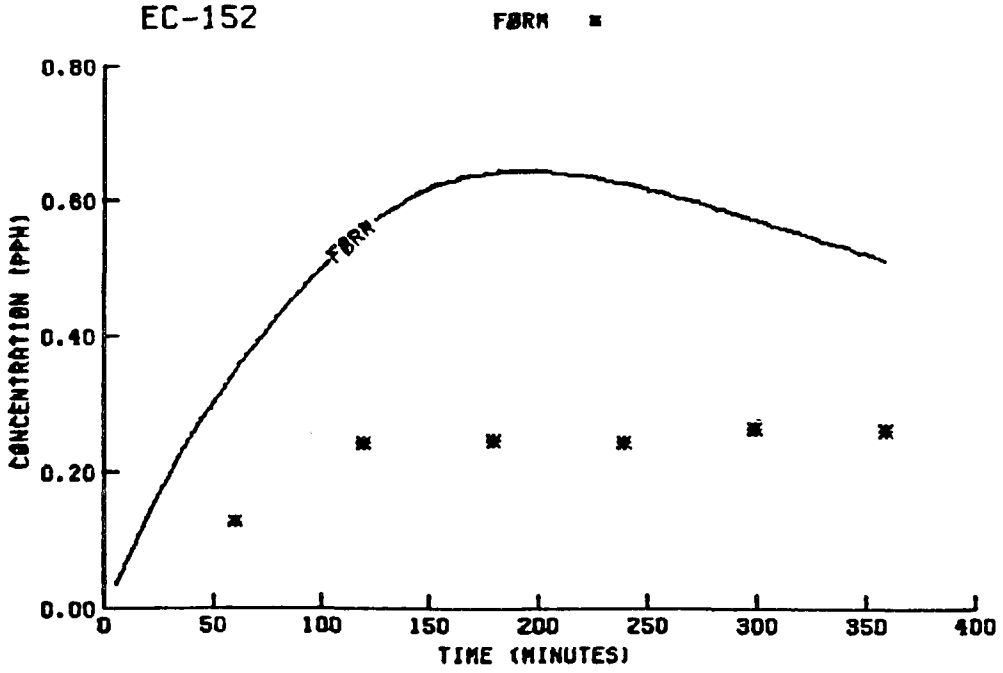

EC-152
O3
CONCENTRATION (PPM)
1.00
0.75
0.50
0.25
0.00
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

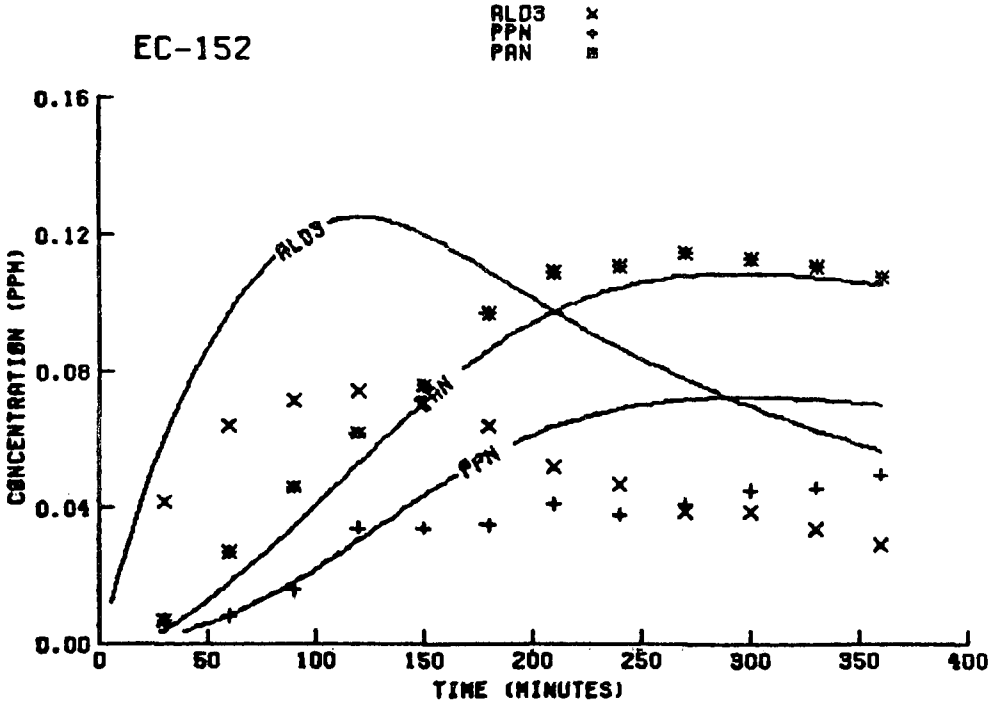

EC-152
NO2
NO
CONCENTRATION (PPM)
0.52
0.39
0.26
0.13
0.00
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

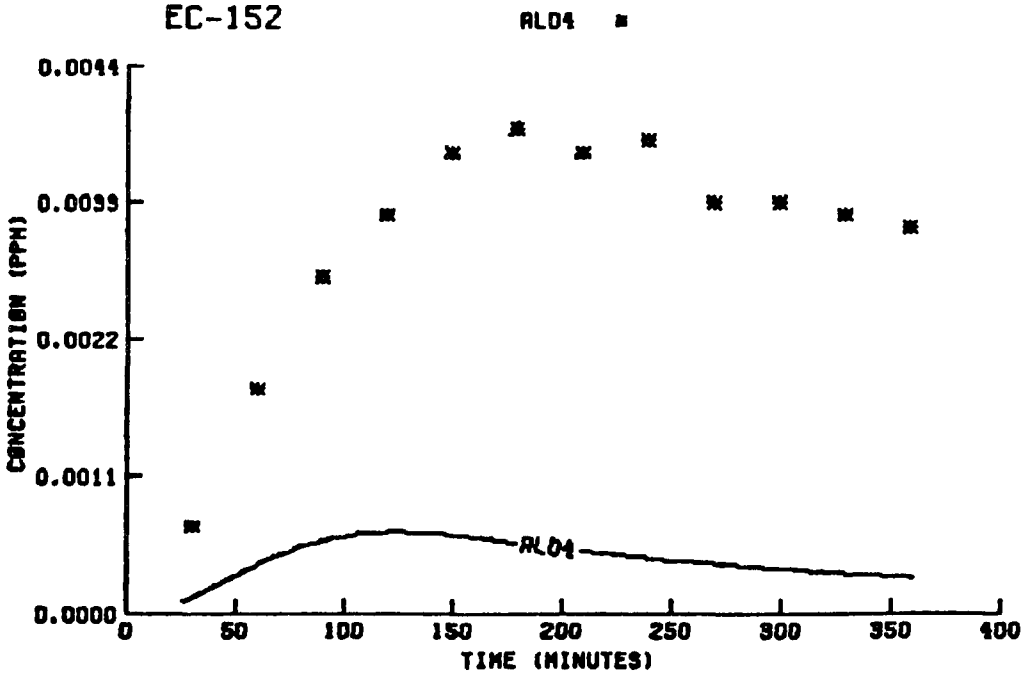

EC-152
ETH
1.20
0.90
0.60
0.30
0.00
CONCENTRATION (PPM)
ETH
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

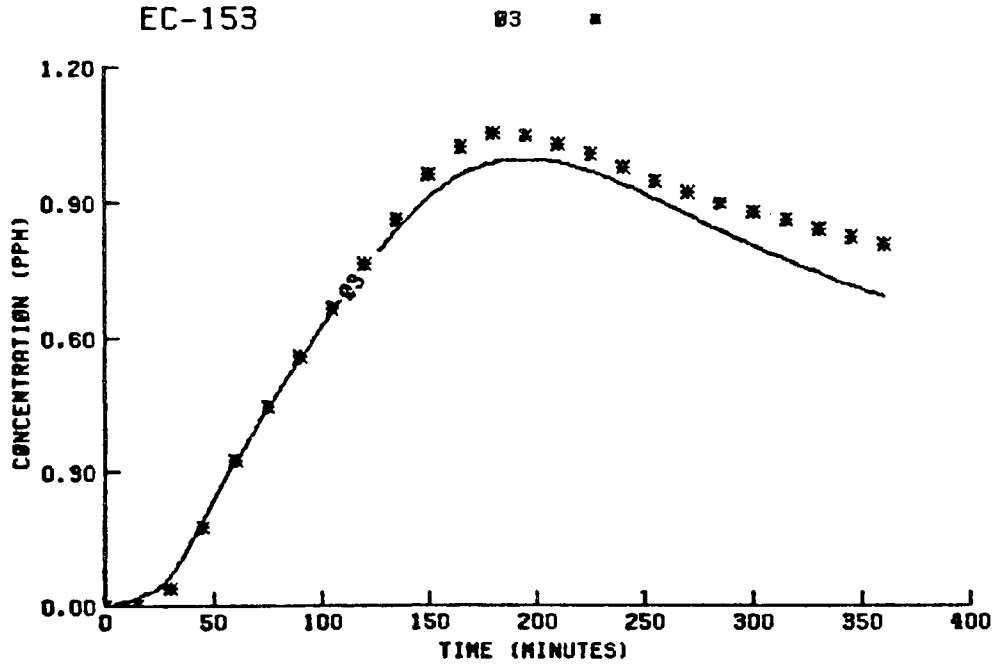

EC-152
ALD2
PROP
0.24
0.18
0.12
0.06
0.00
CONCENTRATION (PPM)
ALD2
PROP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

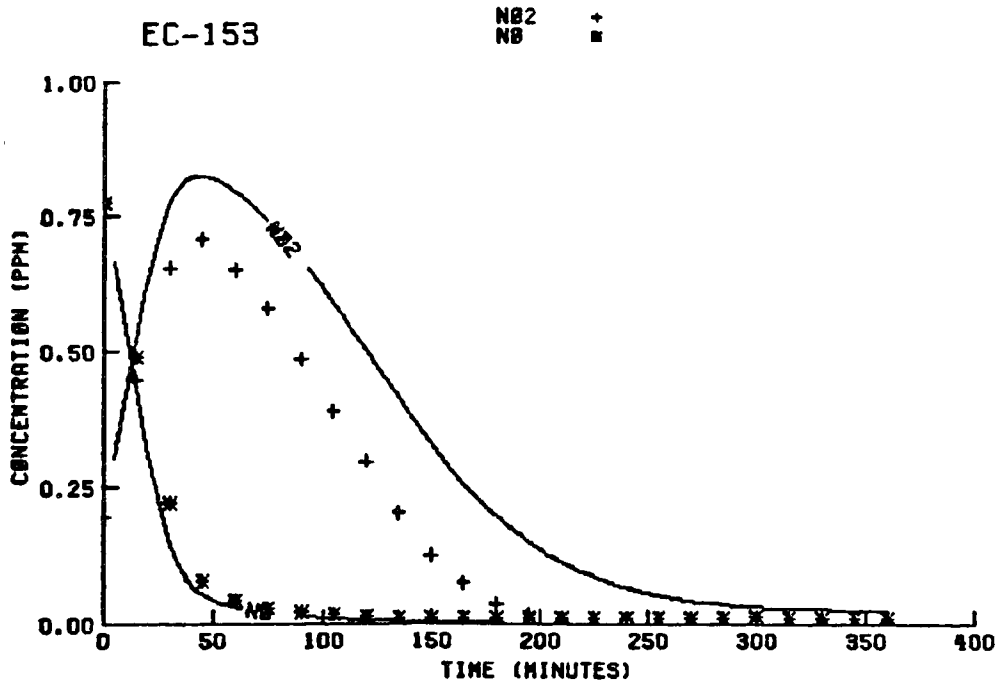

EC-152
BUT1 +
BUT2 *
0.28
0.21
0.14
0.07
0.00
CONCENTRATION (PPM)
BUT1
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

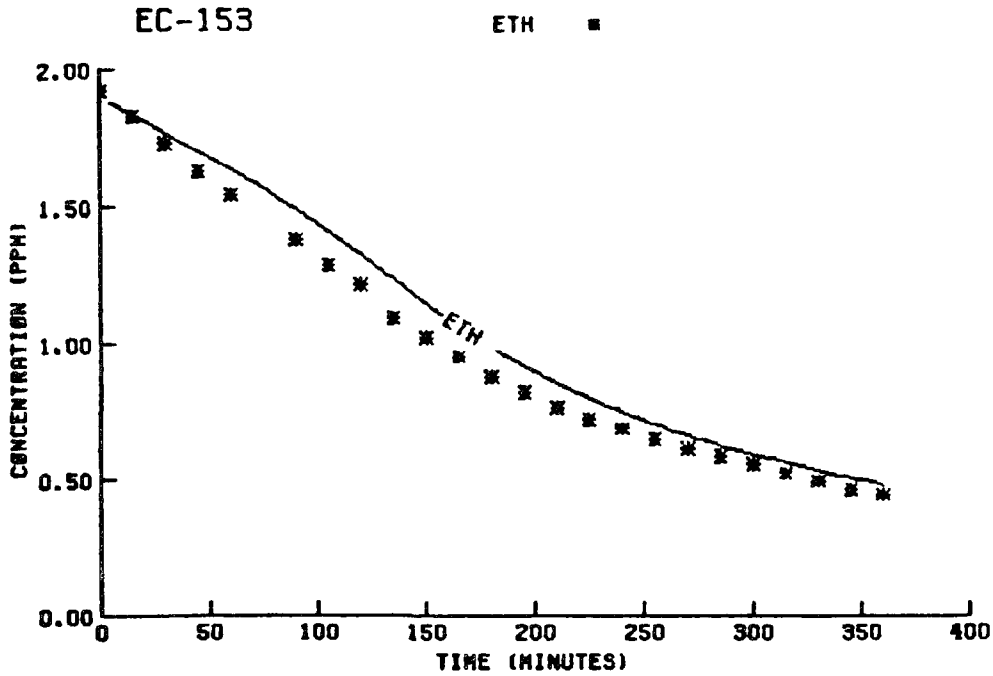

EC-152
FORM *
0.80
0.60
0.40
0.20
0.00
CONCENTRATION (PPM)
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

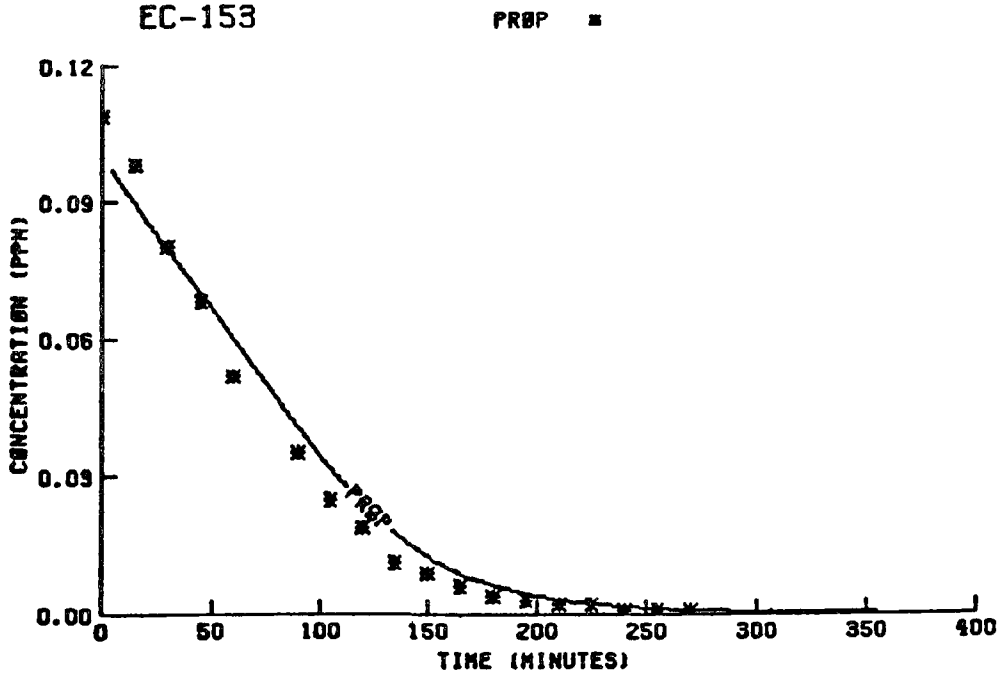

EC-152
ALD3
PPN
PAN
0.16
0.12
0.08
0.04
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

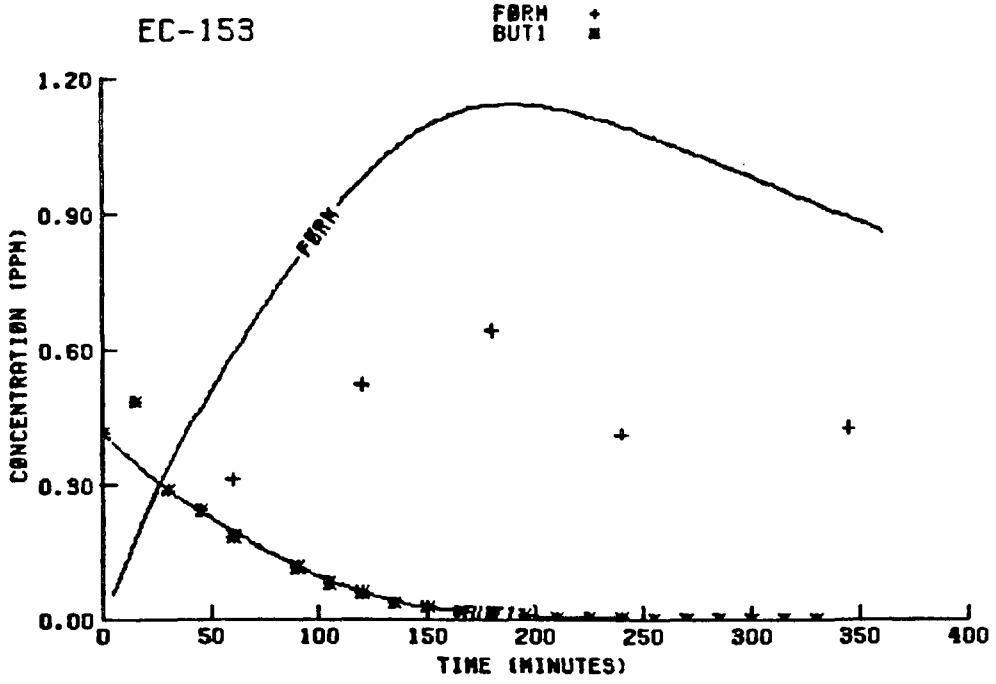

EC-152
ALD4
0.0044
0.0033
0.0022
0.0011
0.0000
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

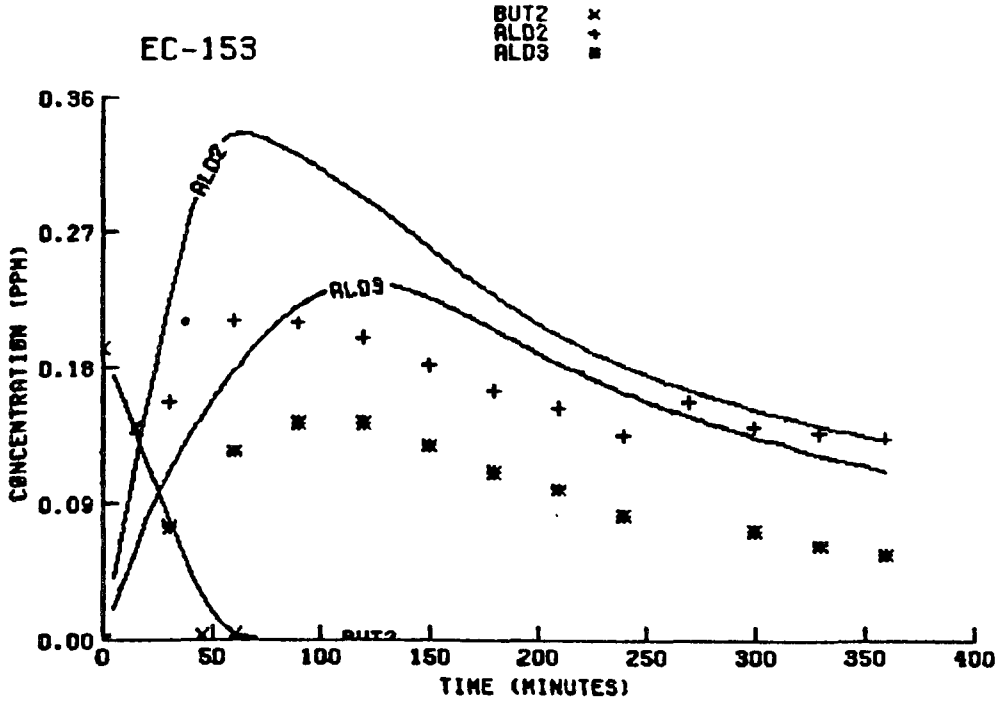

EC-153
03
1.20
0.90
0.60
0.30
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

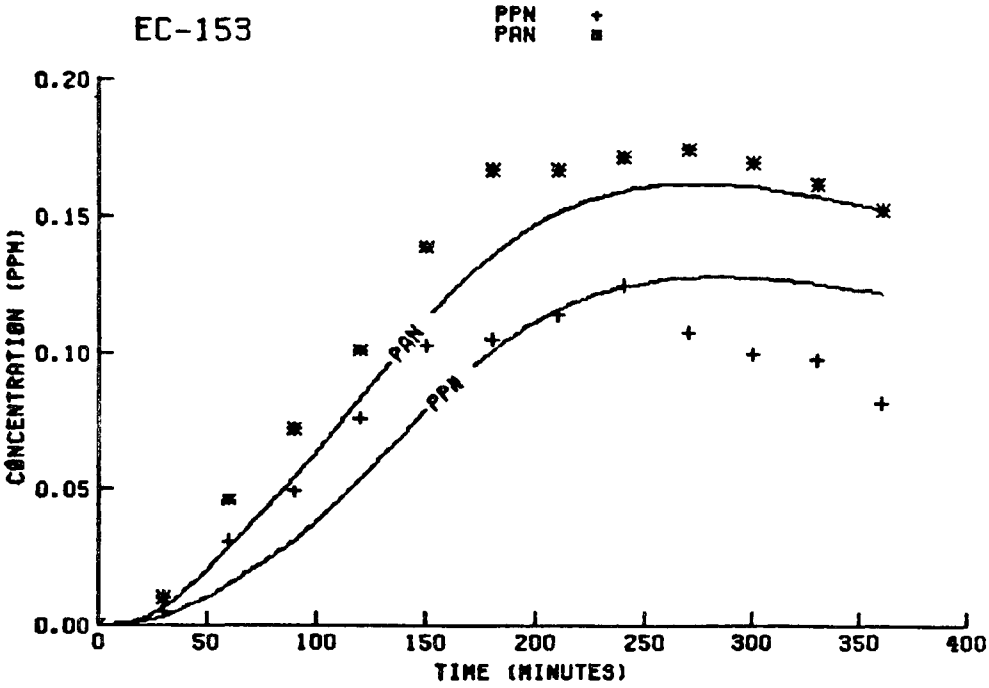

EC-153
NO2
NO
1.00
0.75
0.50
0.25
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

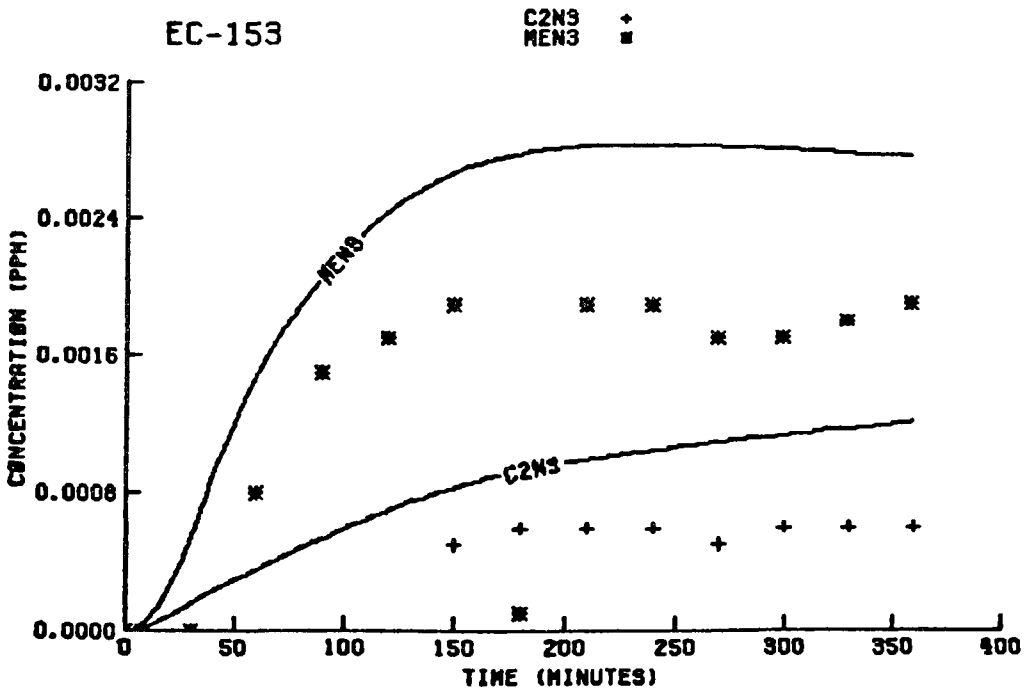

EC-153
ETH
2.00
1.50
1.00
0.50
0.00
CONCENTRATION (PPM)
ETH
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

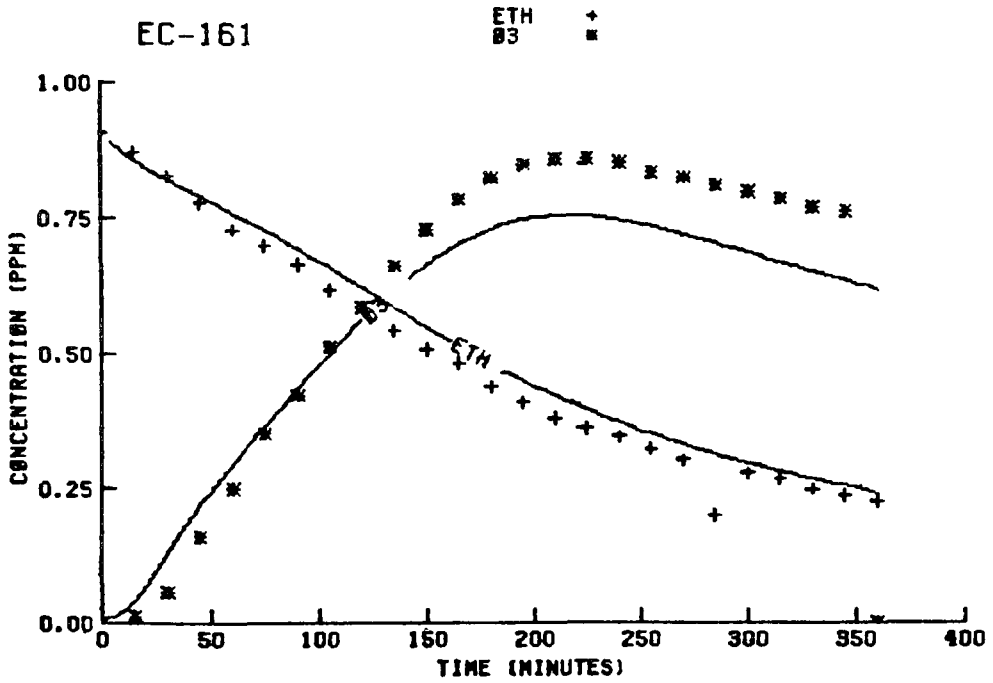

EC-153
PROP
0.12
0.09
0.06
0.03
0.00
CONCENTRATION (PPM)
PROP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

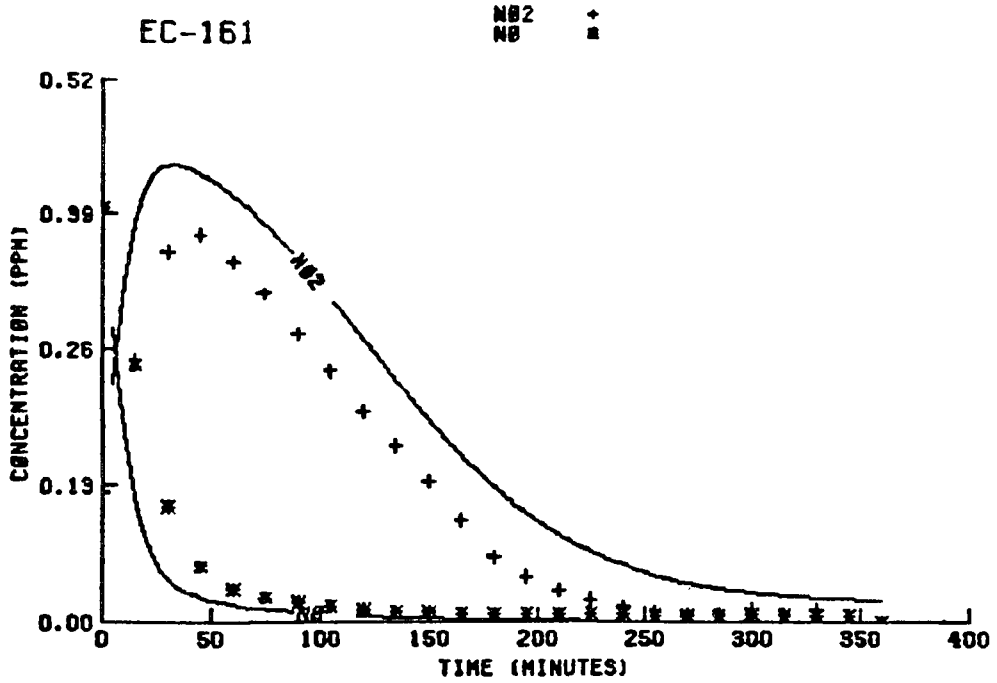

EC-153
FORM +
BUT1 *
1.20
0.90
0.60
0.30
0.00
CONCENTRATION (PPM)
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

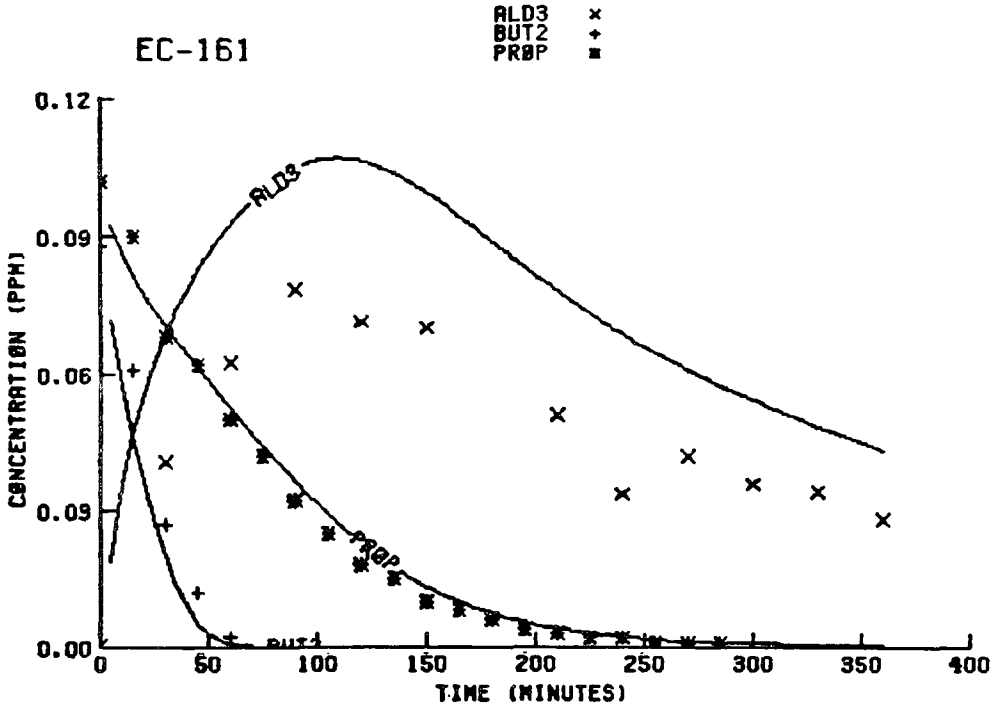

BUT2 ×
ALD2 +
ALD3 *
EC-153
0.36
0.27
0.18
0.09
0.00
CONCENTRATION (PPM)
ALD2
ALD3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

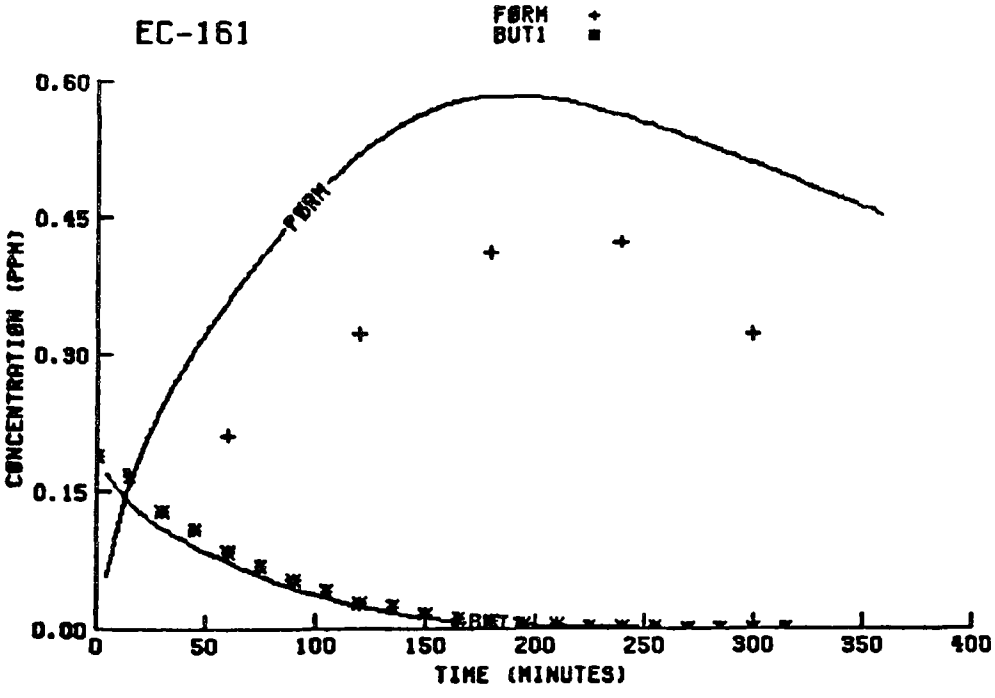

EC-153
PPN
PAN
0.20
0.15
0.10
0.05
0.00
CONCENTRATION (PPM)
PAN
PPN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

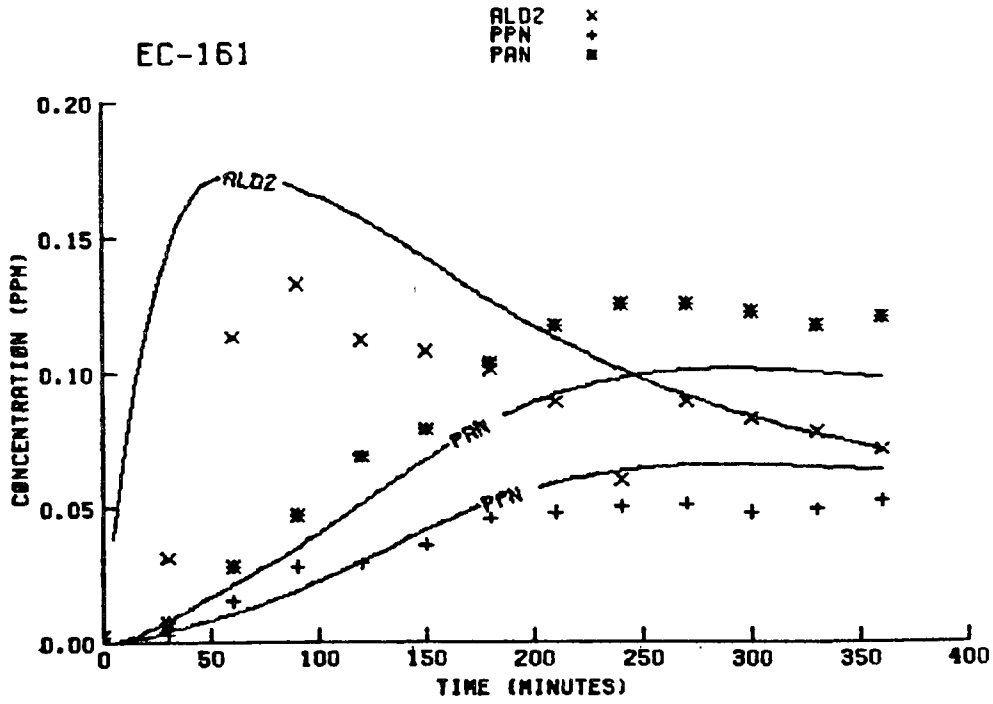

EC-153
C2N3
MEN3
0.0032
0.0024
0.0016
0.0008
0.0000
CONCENTRATION (PPM)
MEN3
C2N3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

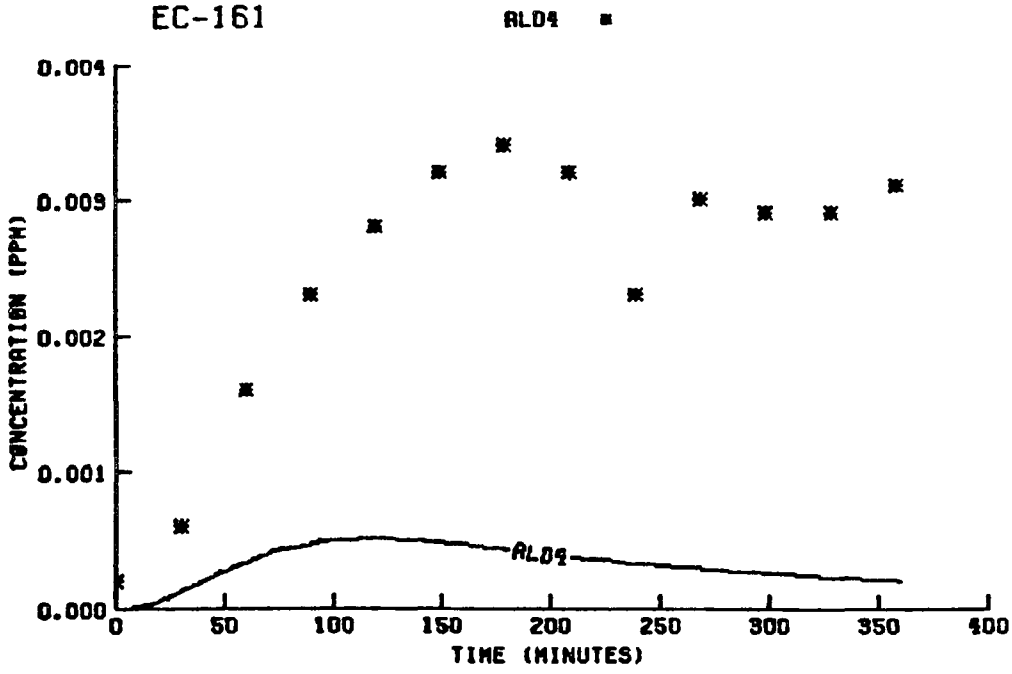

EC-161
ETH
O3
1.00
0.75
0.50
0.25
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

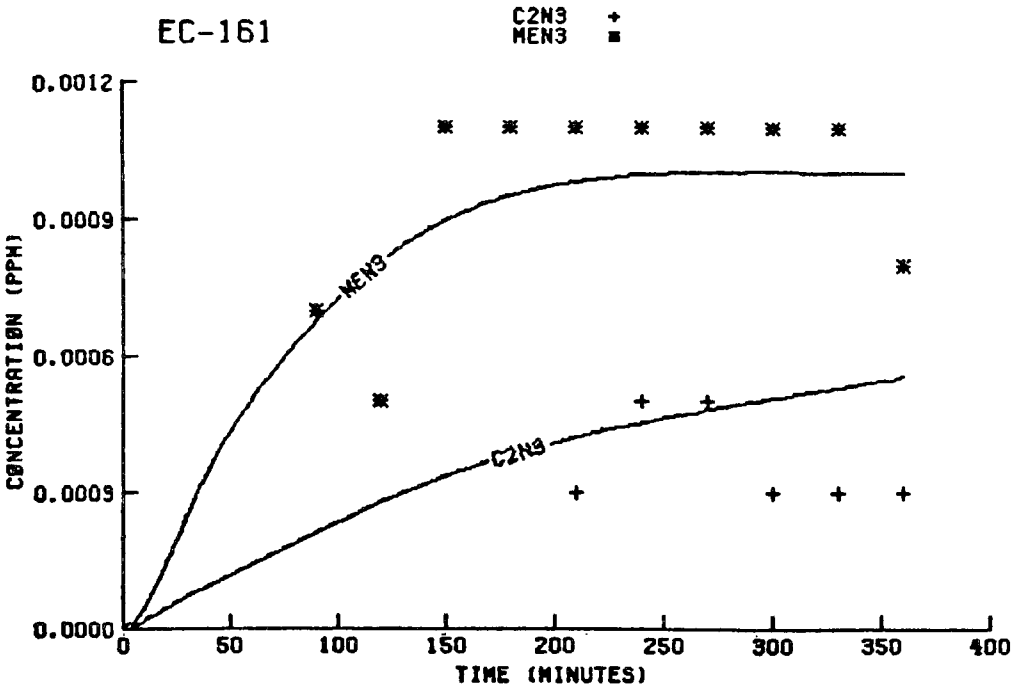

EC-161
NO2
NO
0.52
0.39
0.26
0.13
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-161
ALD3 ×
BUT2 +
PROP ■
0.12
0.09
0.06
0.09
0.00
CONCENTRATION (PPM)
ALD3
PROP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-161
FORM +
BUT1 ■
0.60
0.45
0.30
0.15
0.00
CONCENTRATION (PPM)
FORM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-161
ALD2 ×
PPN +
PAN ■
0.20
0.15
0.10
0.05
0.00
CONCENTRATION (PPM)
ALD2
PAN
PPN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

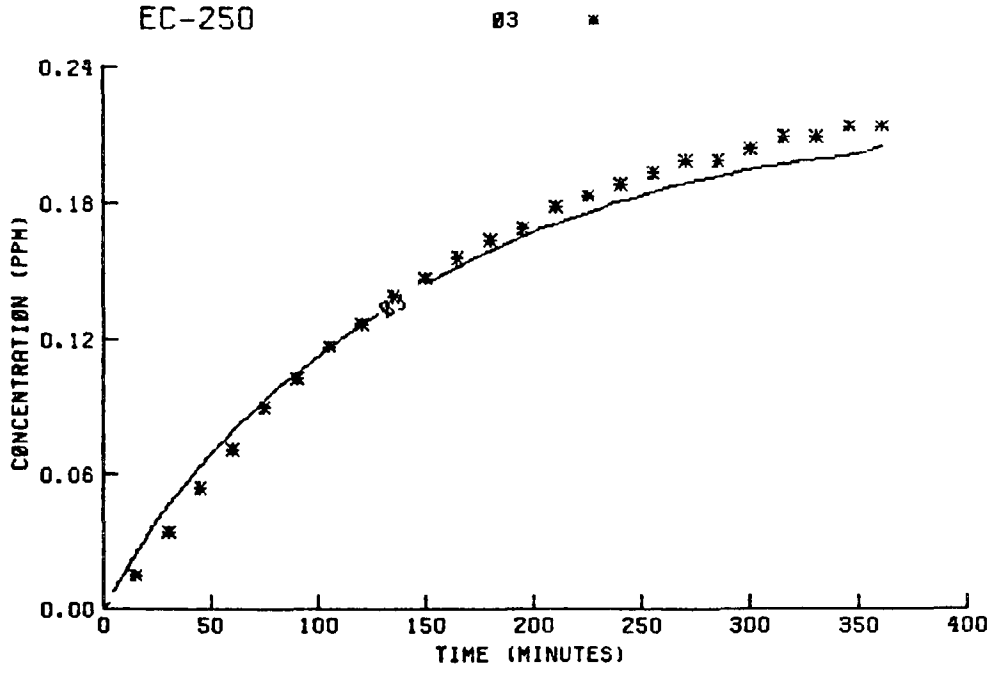

EC-161
ALD4 ■
0.004
0.003
0.002
0.001
0.000
CONCENTRATION (PPM)
ALD4
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

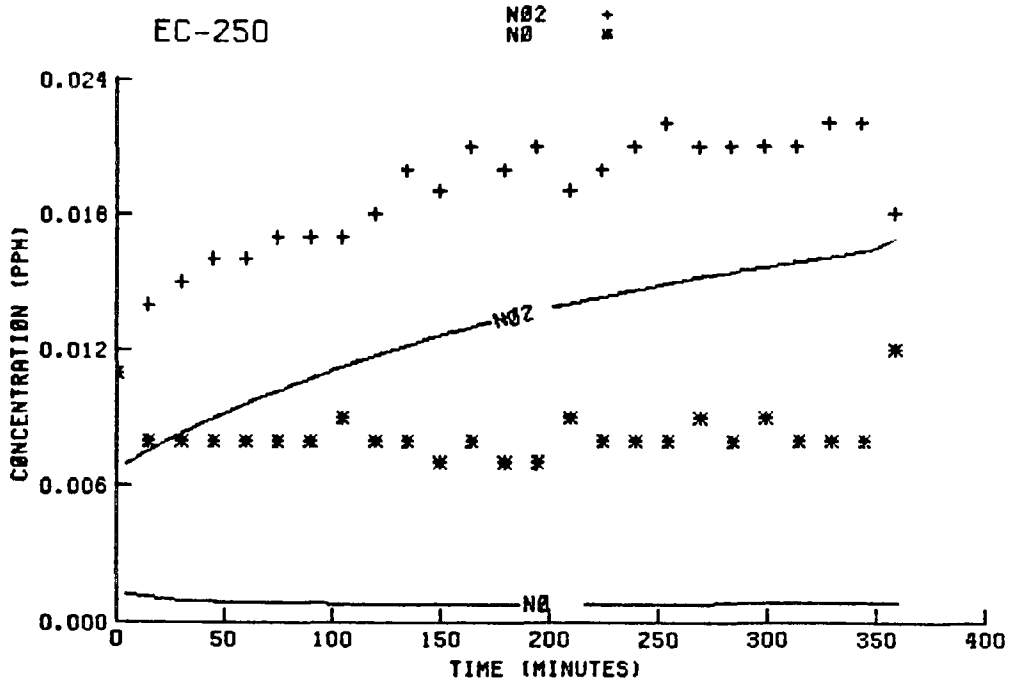

EC-161
C2N3 +
MEN3 ■
0.0012
0.0009
0.0006
0.0003
0.0000
CONCENTRATION (PPM)
MEN3
C2N3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

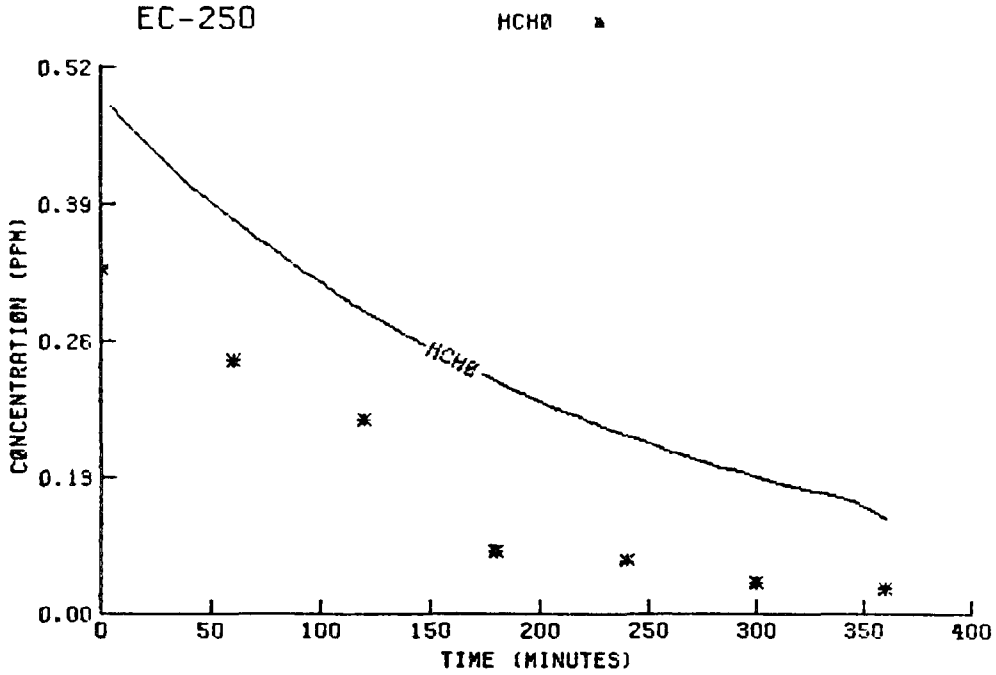
Part B

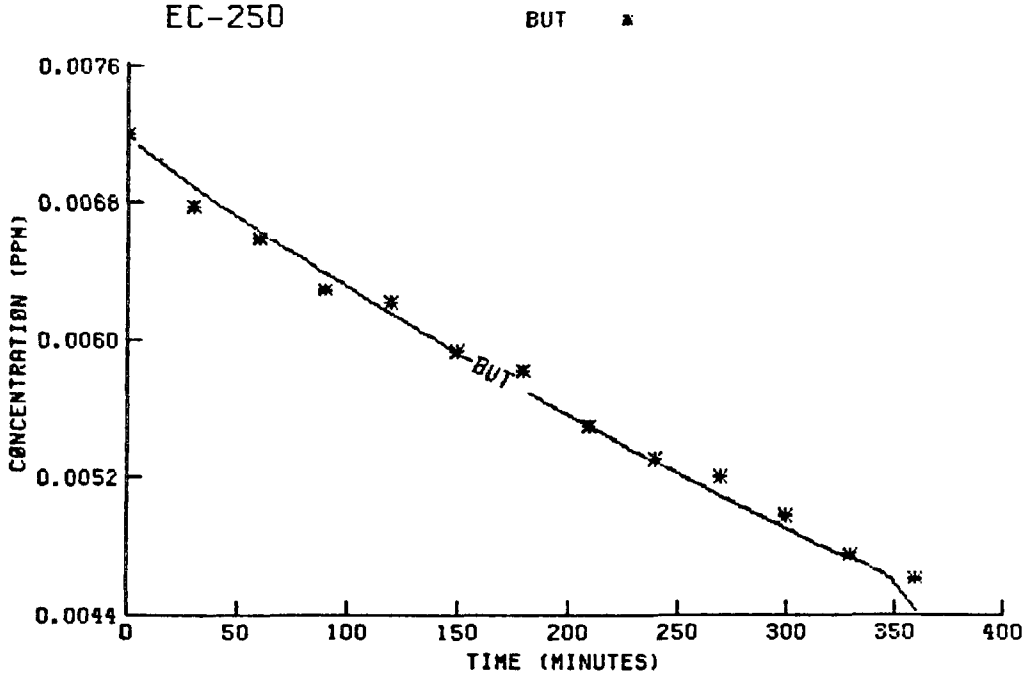
Simulation Results with the Carbon-Bond Mechanism

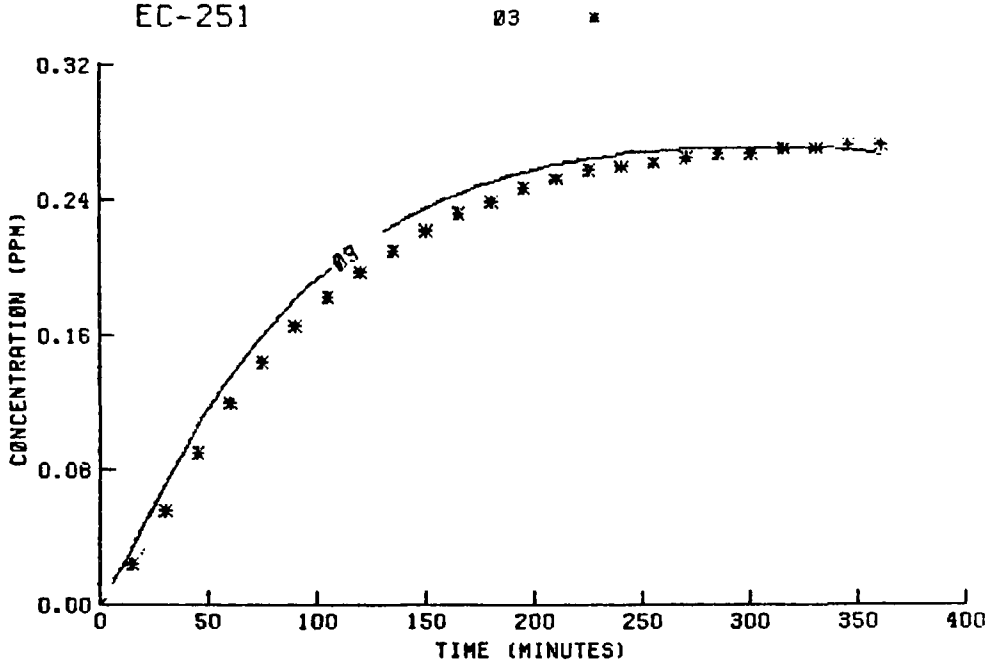
UCR FORMALDEHYDE EXPERIMENTS

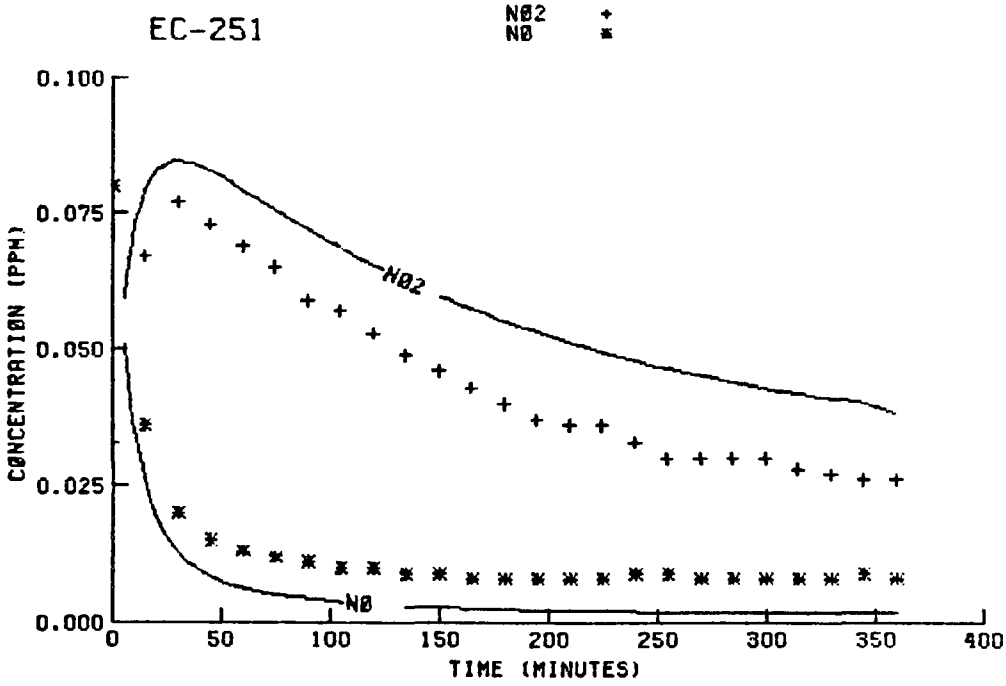

EC-250
Ø3
0.24
0.18
0.12
0.06
0.00
CØNCENTRATIØN (PPH)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

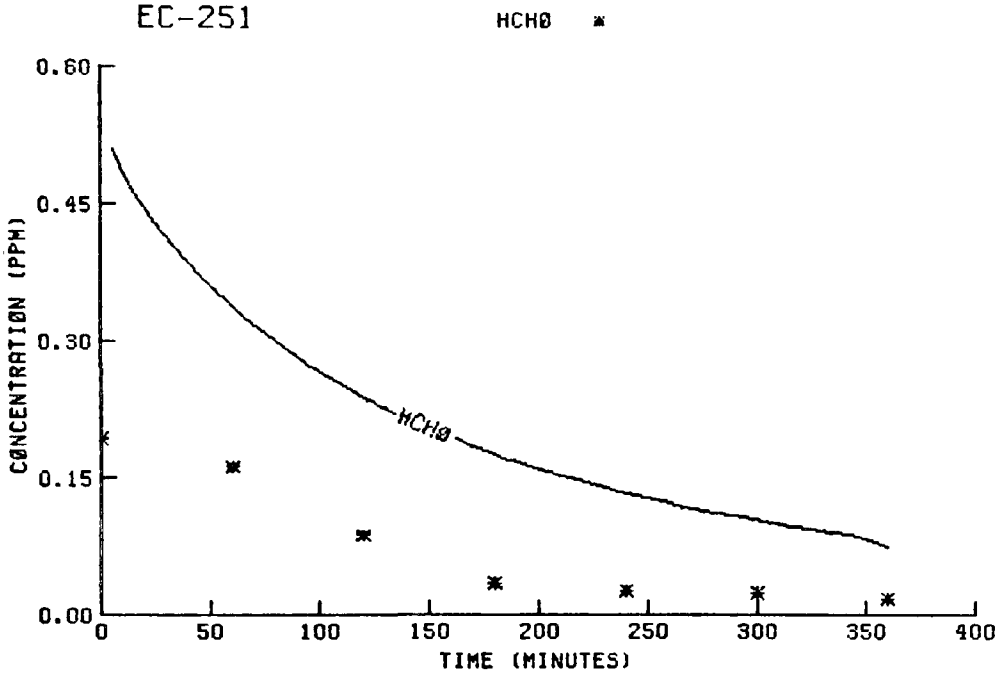

EC-250
NØ2
NØ
0.024
0.018
0.012
0.006
0.000
CØNCENTRATIØN (PPH)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

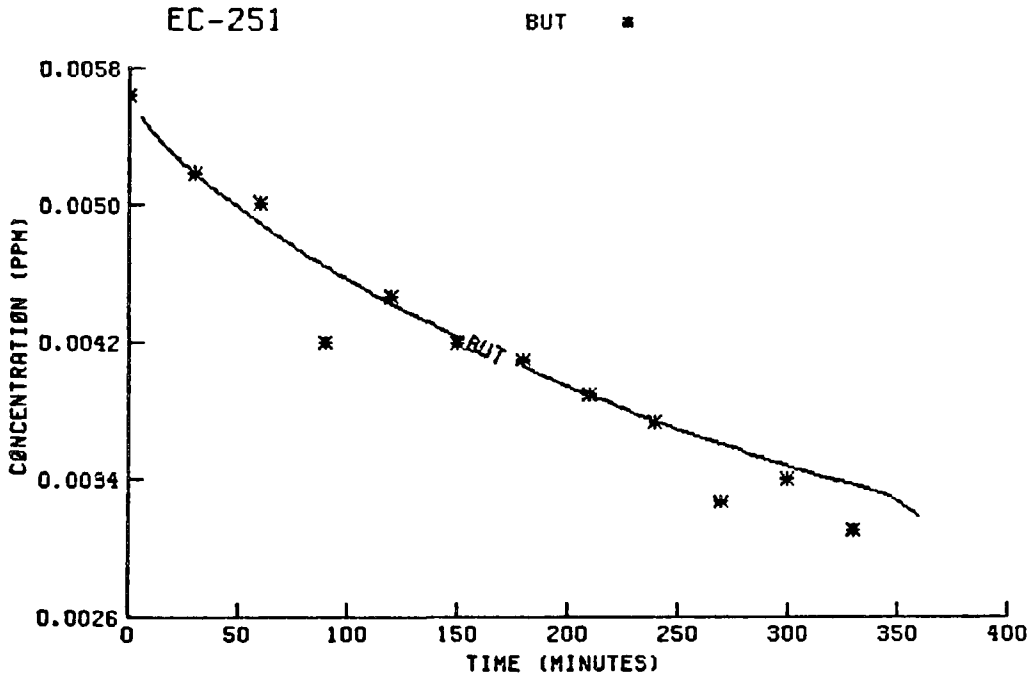

EC-250
HCHØ
0.52
0.39
0.26
0.13
0.00
CØNCENTRATIØN (PPM)
HCHØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

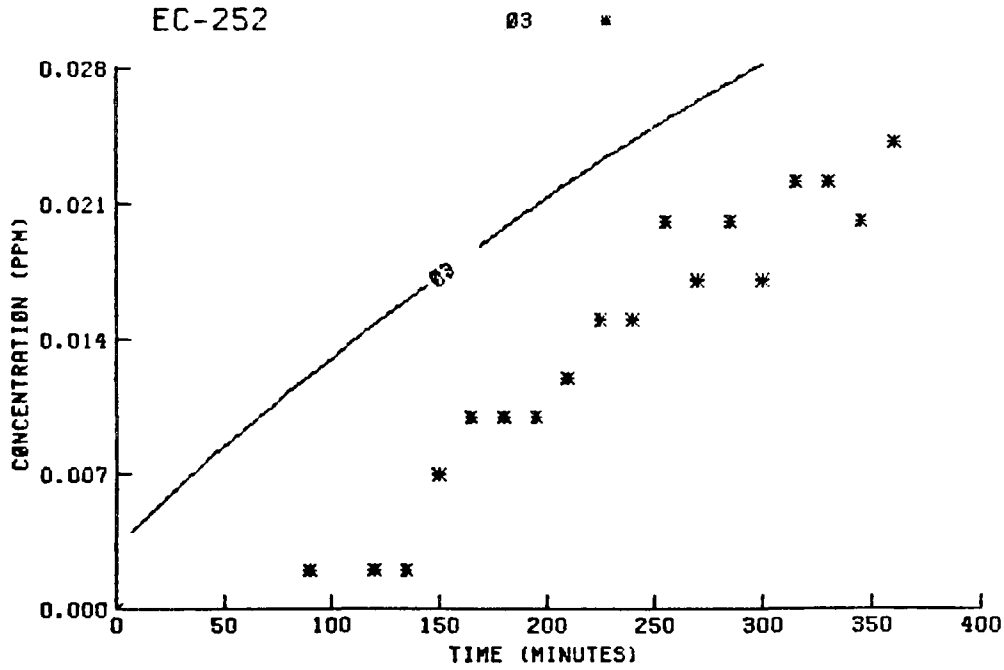

EC-250
BUT
0.0076
0.0068
0.0060
0.0052
0.0044
CØNCENTRATIØN (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

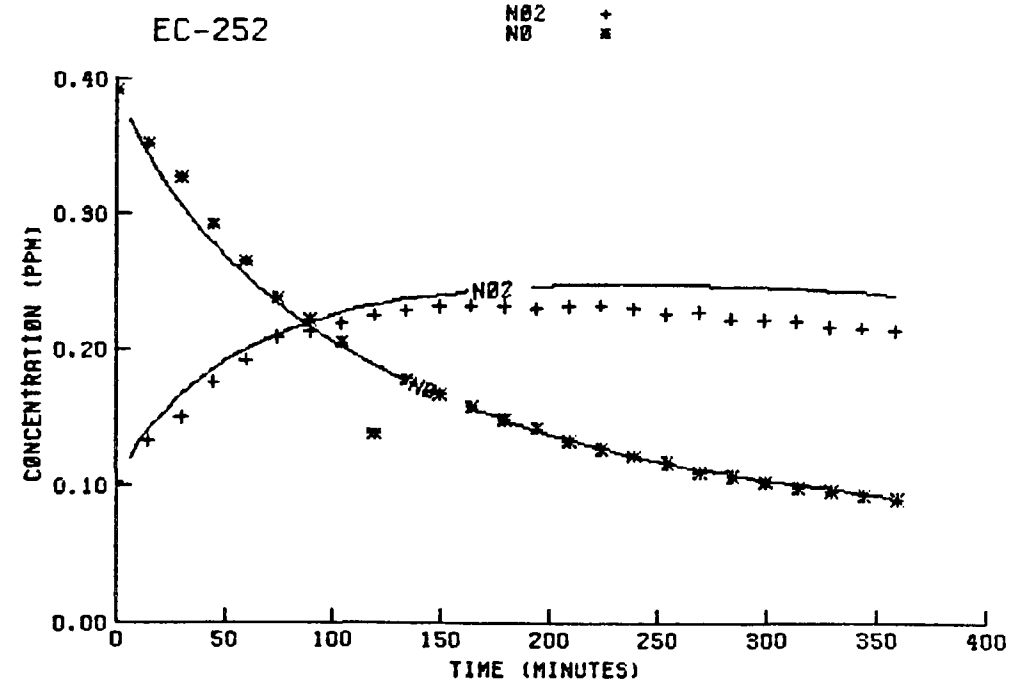

EC-251
Ø3
0.32
0.24
0.16
0.08
0.00
CØNCENTRATIØN (PPM)
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

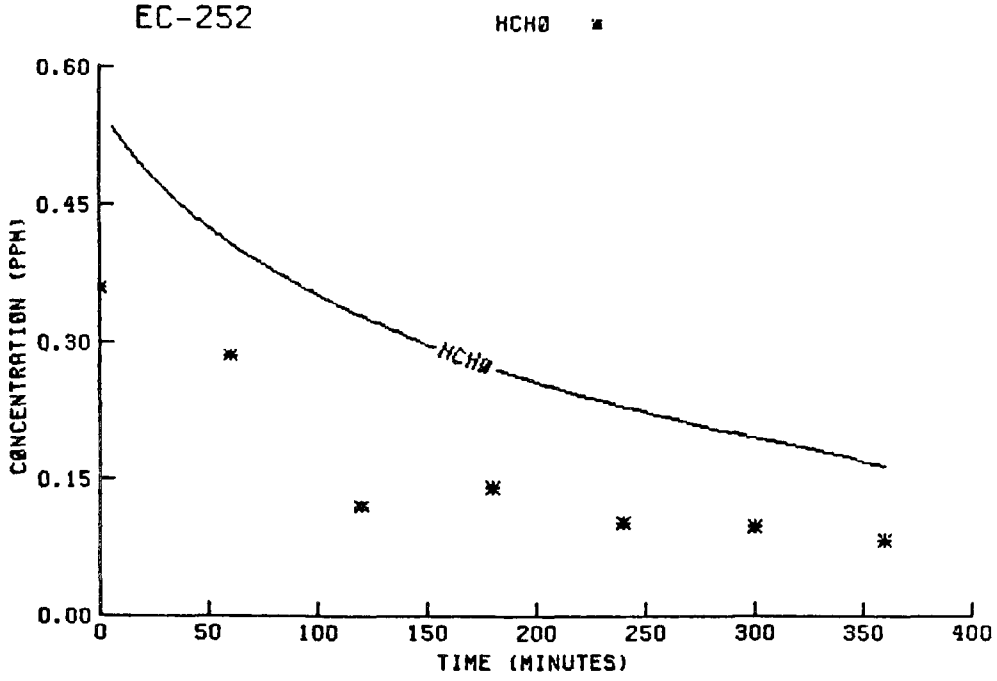

EC-251
NØ2
NØ
0.100
0.075
0.050
0.025
0.000
CØNCENTRATIØN (PPM)
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

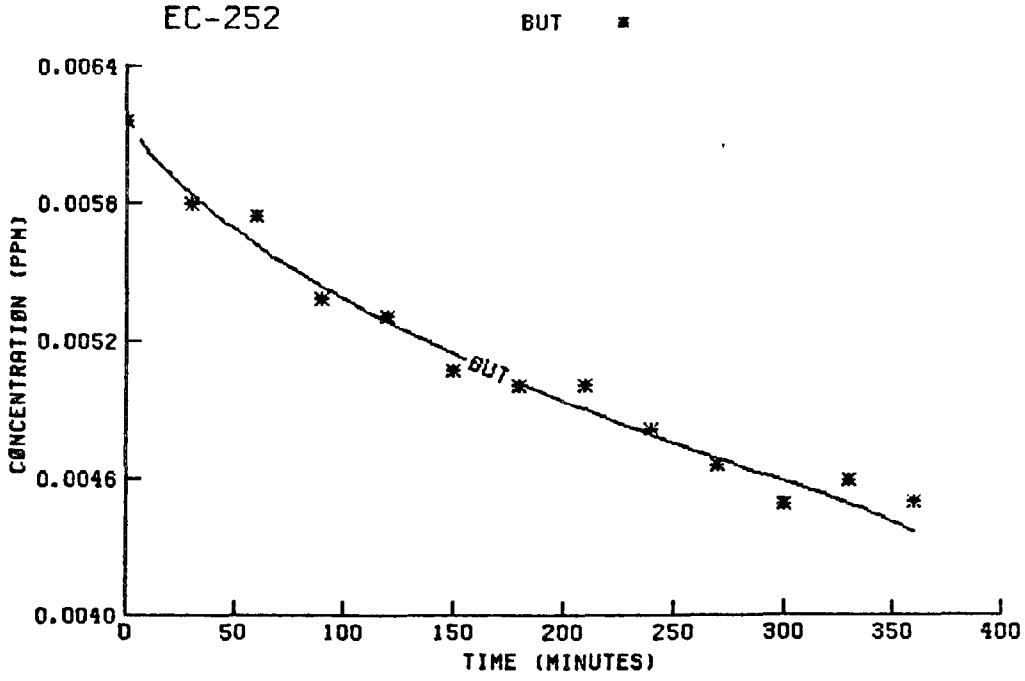

EC-251
HCHØ
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
HCHØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

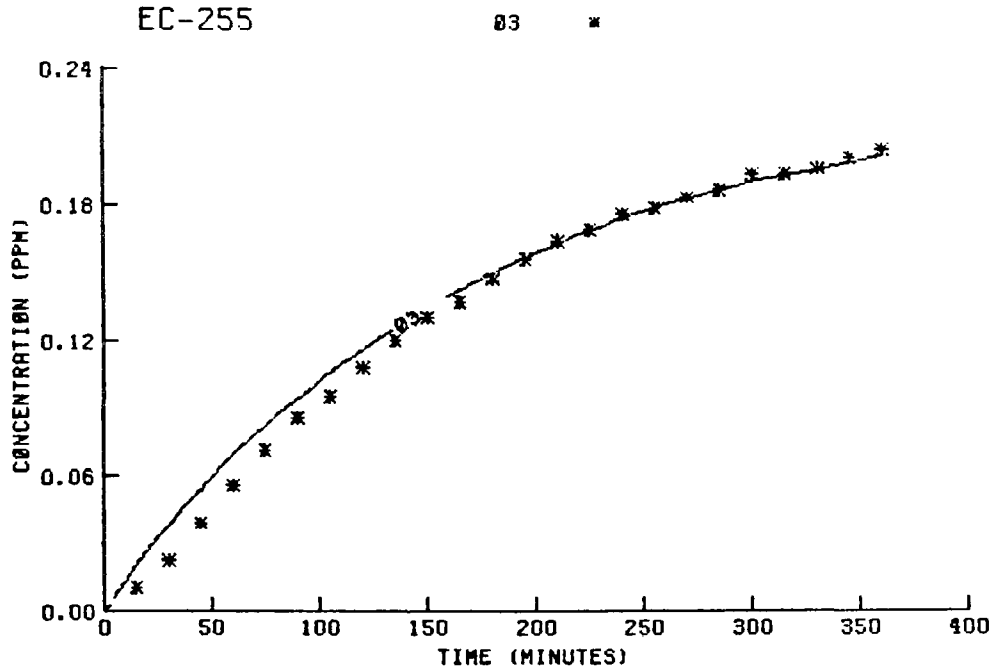

EC-251
BUT
0.0058
0.0050
0.0042
0.0034
0.0026
CØNCENTRATIØN (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

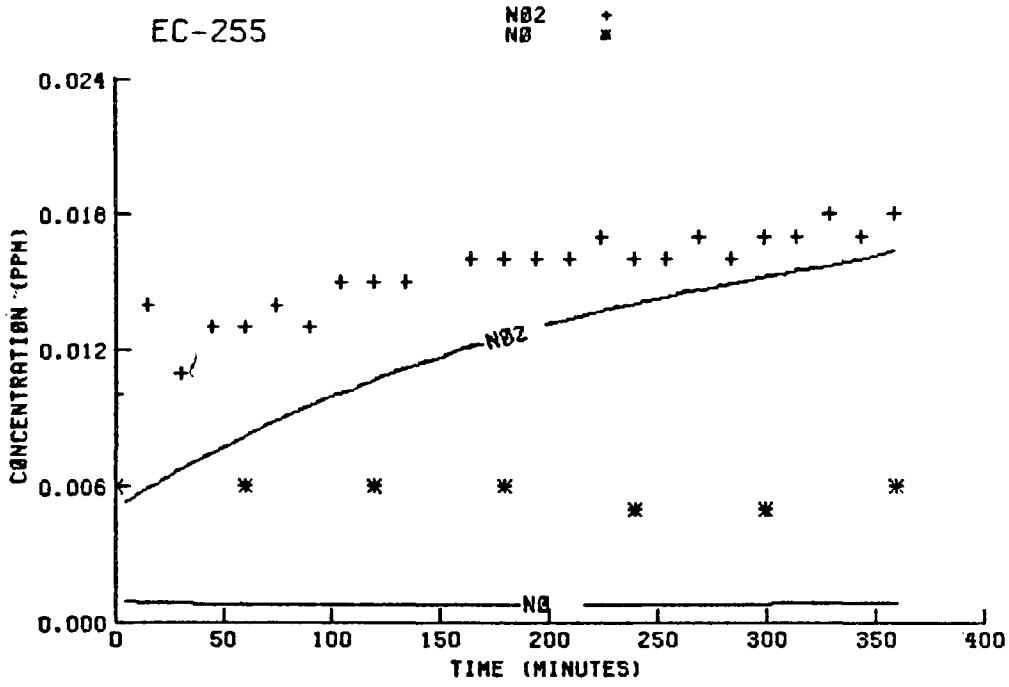

EC-252
Ø3
0.028
0.021
0.014
0.007
0.000
CØNCENTRATIØN (PPM)
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

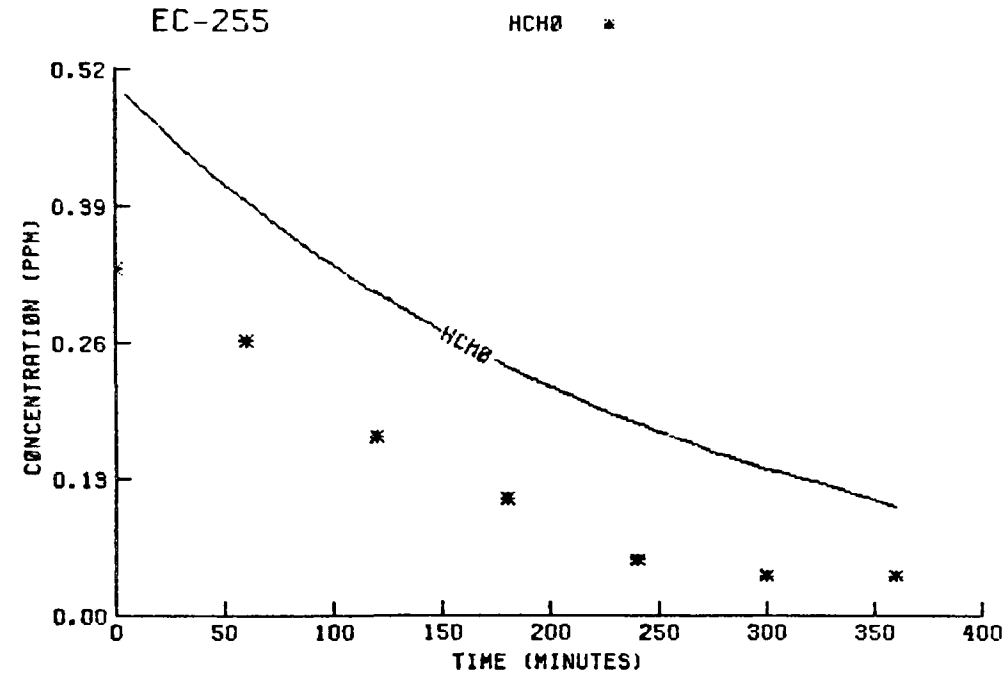

EC-252
NØ2
NØ
0.40
0.30
0.20
0.10
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

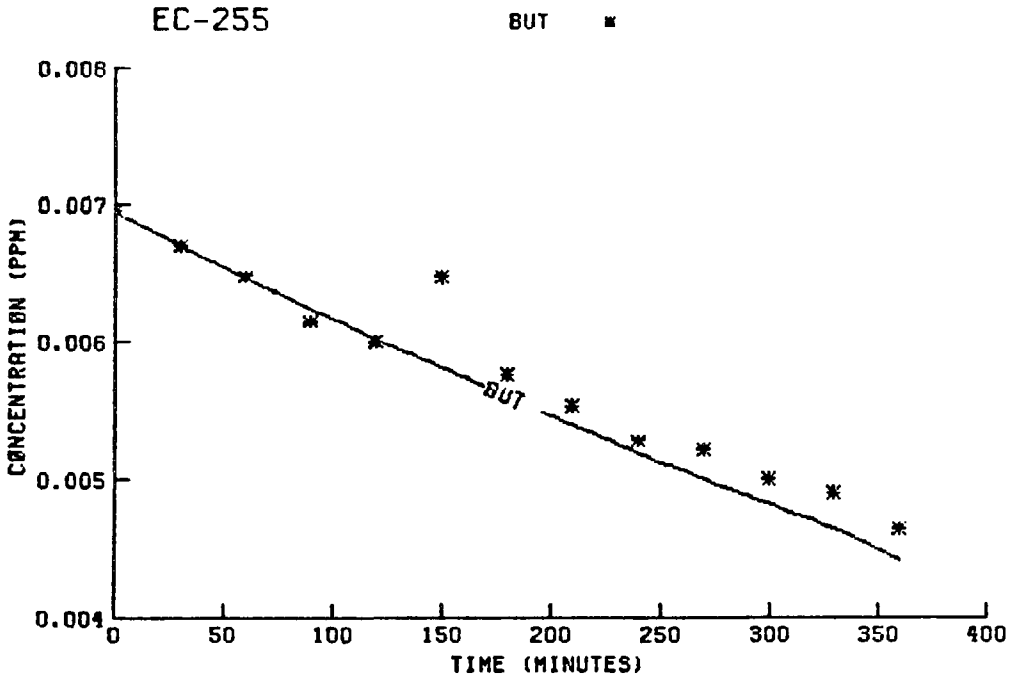

EC-252
HCHØ
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
HCHØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-252
BUT
0.0064
0.0058
0.0052
0.0046
0.0040
CØNCENTRATIØN (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

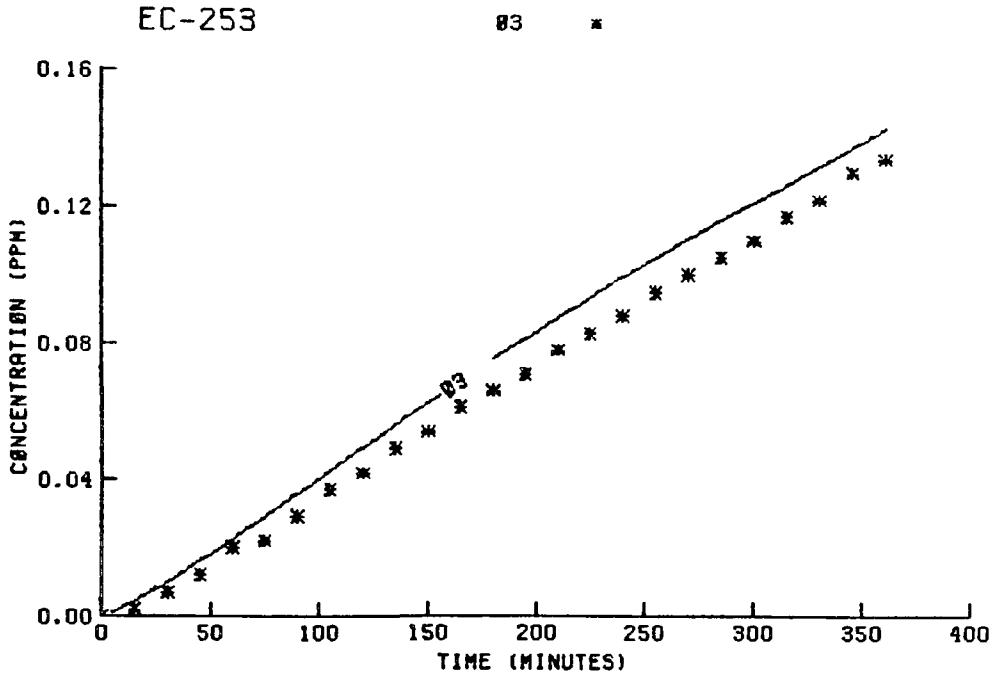

EC-255
Ø3
0.24
0.18
0.12
0.06
0.00
CØNCENTRATIØN (PPM)
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

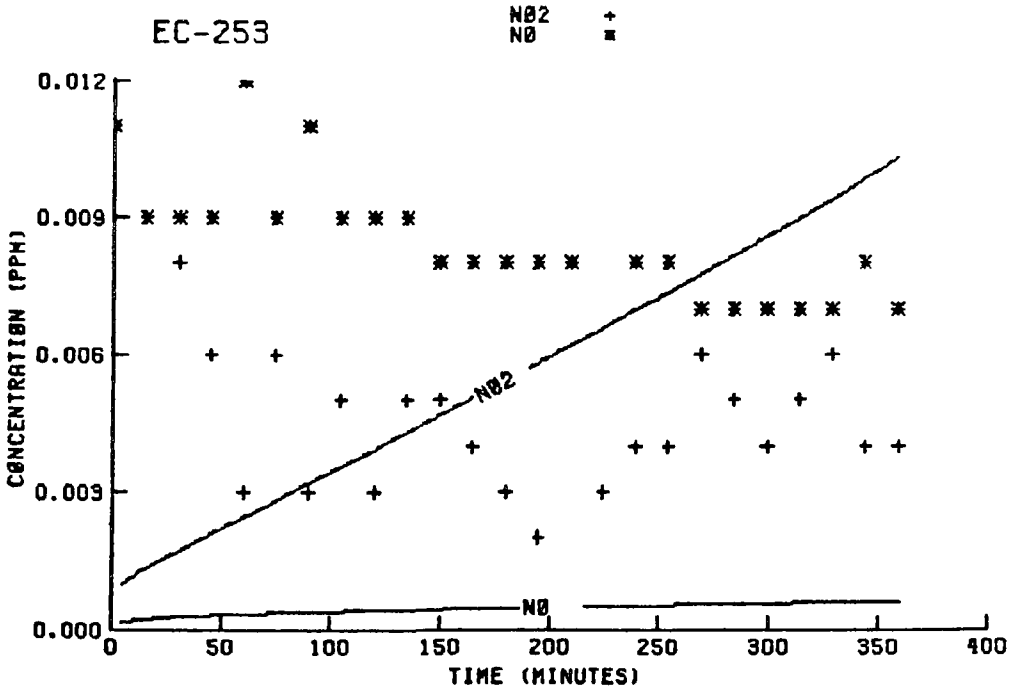

EC-255
NØ2
NØ
0.024
0.018
0.012
0.006
0.000
CØNCENTRATIØN (PPM)
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

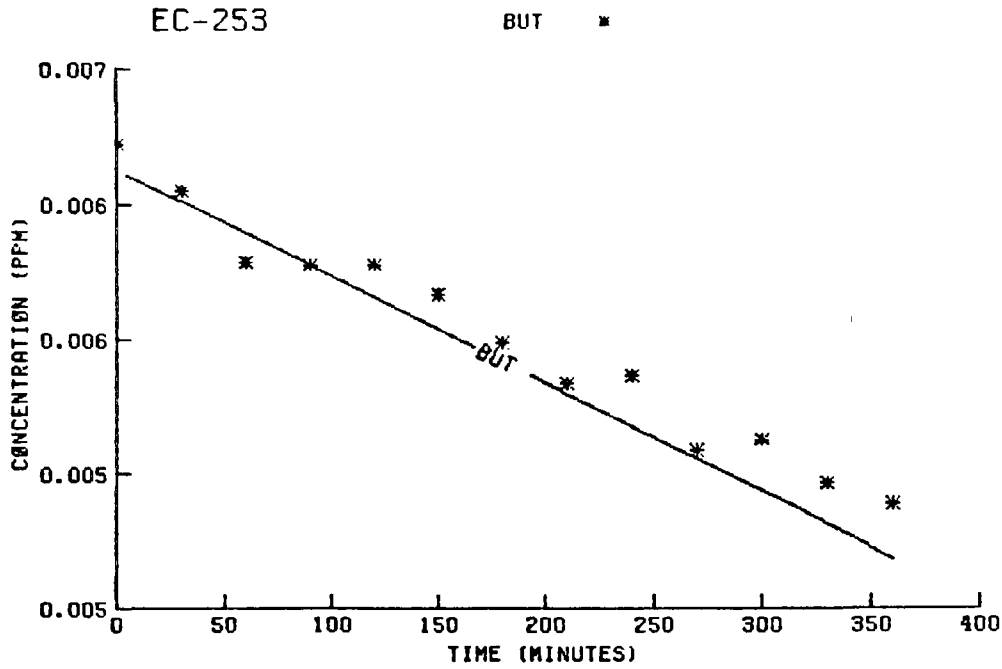

EC-255
HCHØ
0.52
0.39
0.26
0.13
0.00
CØNCENTRATIØN (PPM)
HCHØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

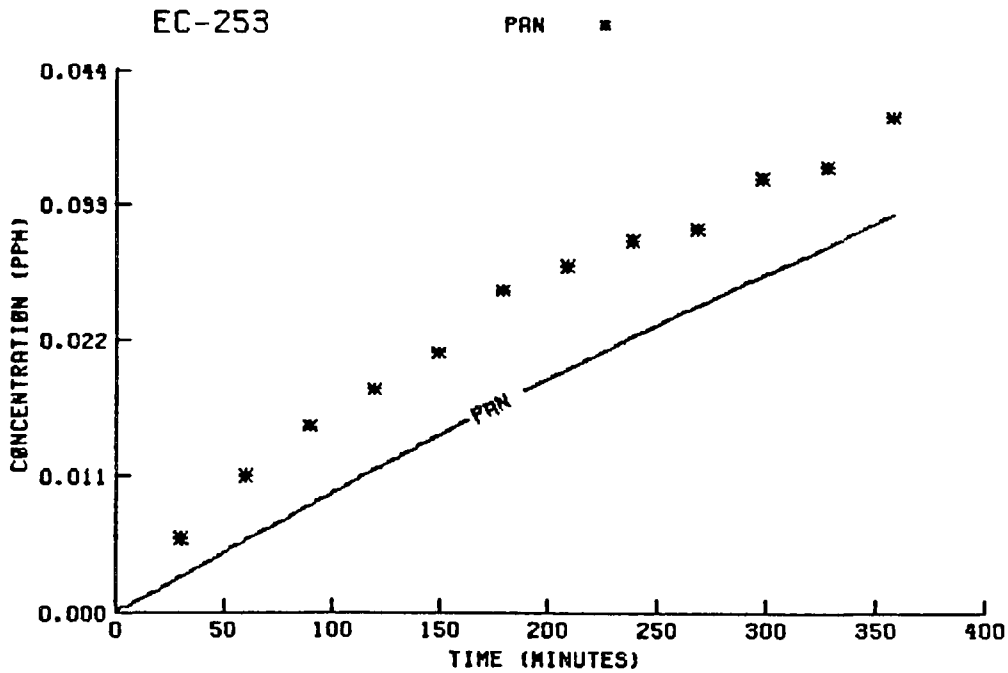

EC-255
BUT
0.008
0.007
0.006
0.005
0.004
CØNCENTRATIØN (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

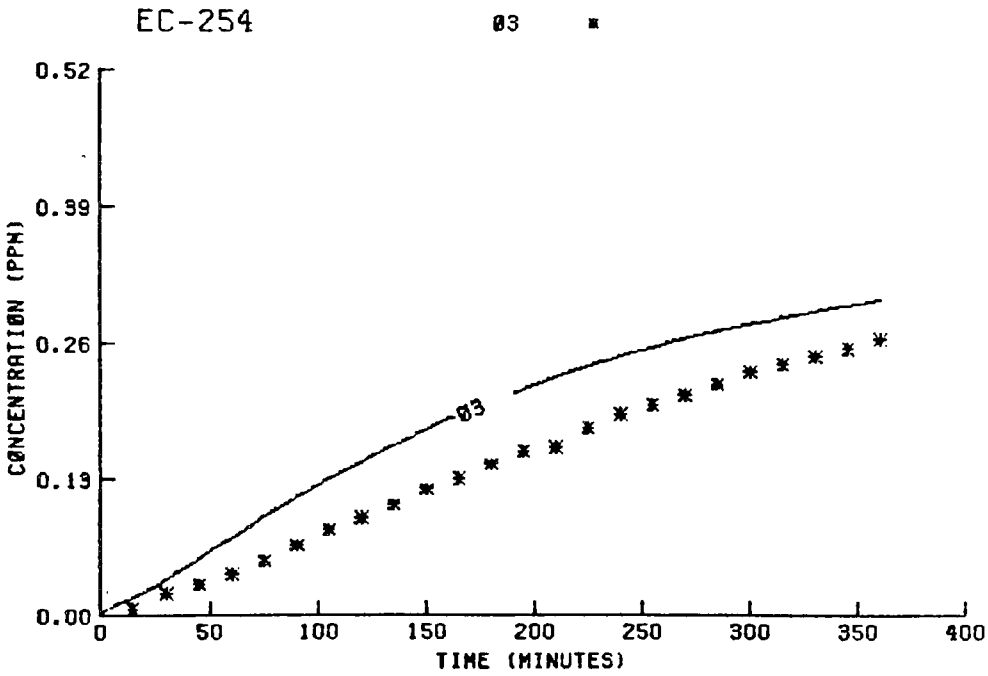
UCR ACETALDEHYDE EXPERIMENTS

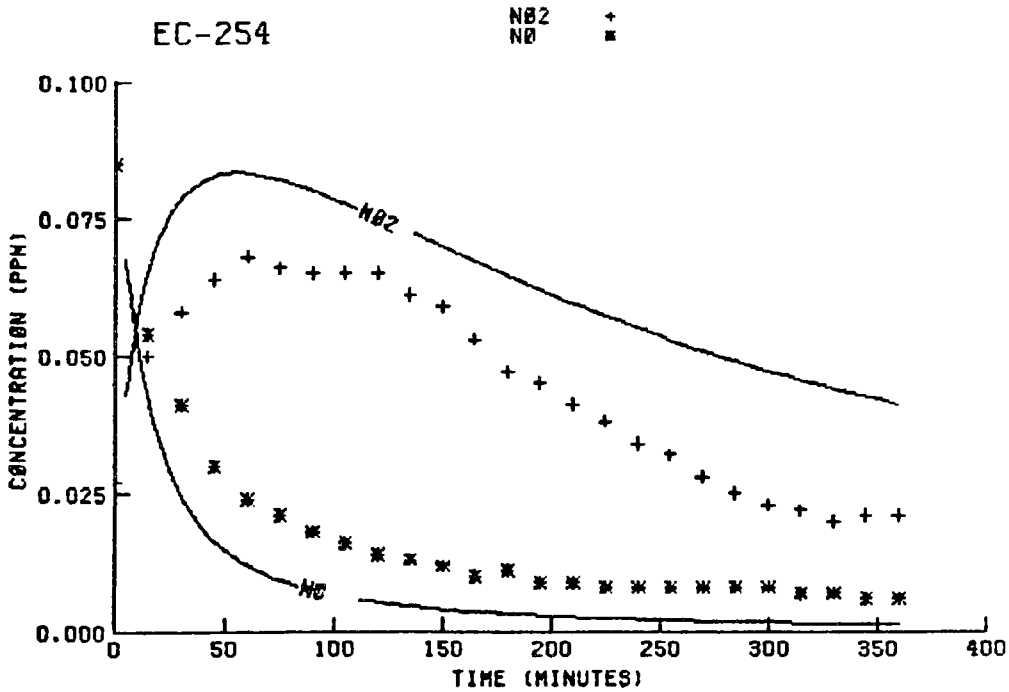

EC-253
Ø3
0.16
0.12
0.08
0.04
0.00
CØNCENTRATIØN (PPM)
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

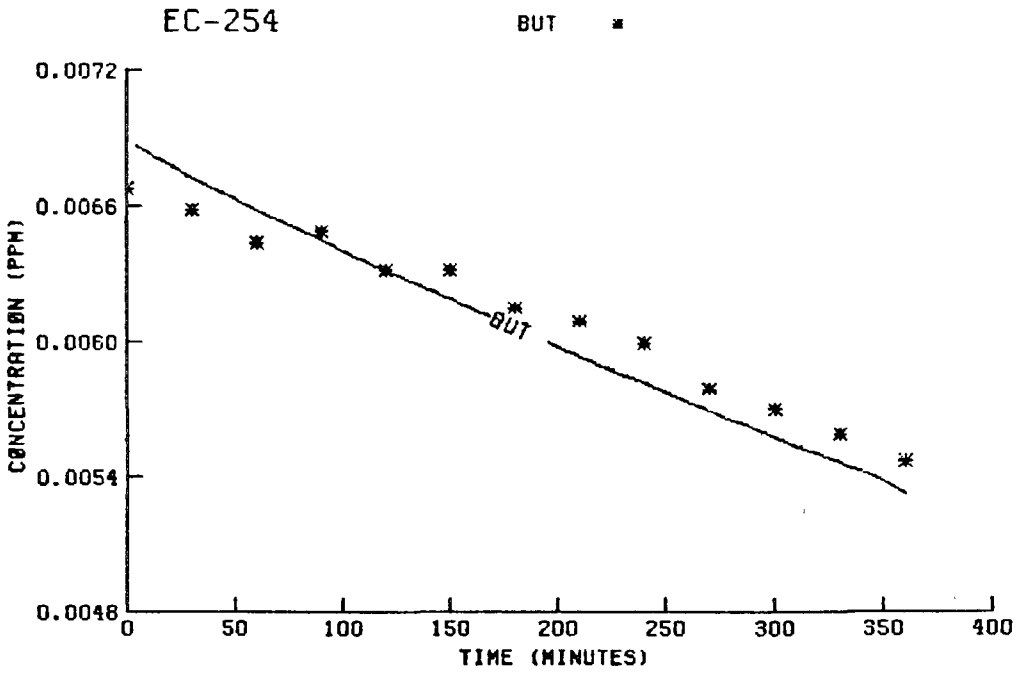

EC-253
NØ2
NØ
0.012
0.009
0.006
0.003
0.000
CØNCENTRATIØN (PPM)
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

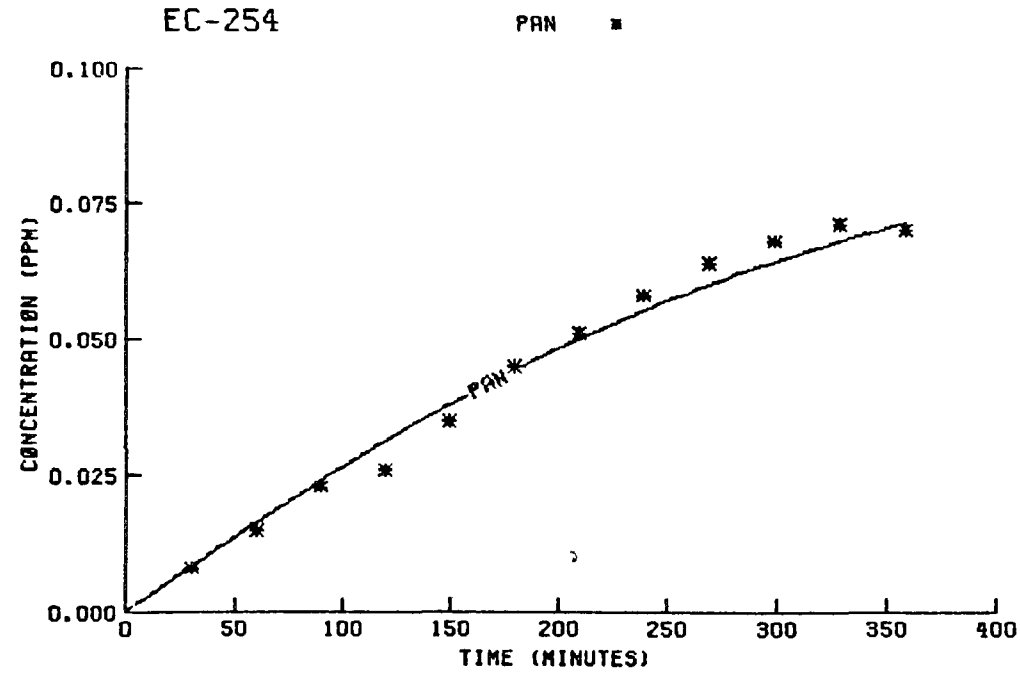

EC-253
BUT
0.007
0.006
0.006
0.005
0.005
CONCENTRATION (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-253
PAN
0.044
0.033
0.022
0.011
0.000
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

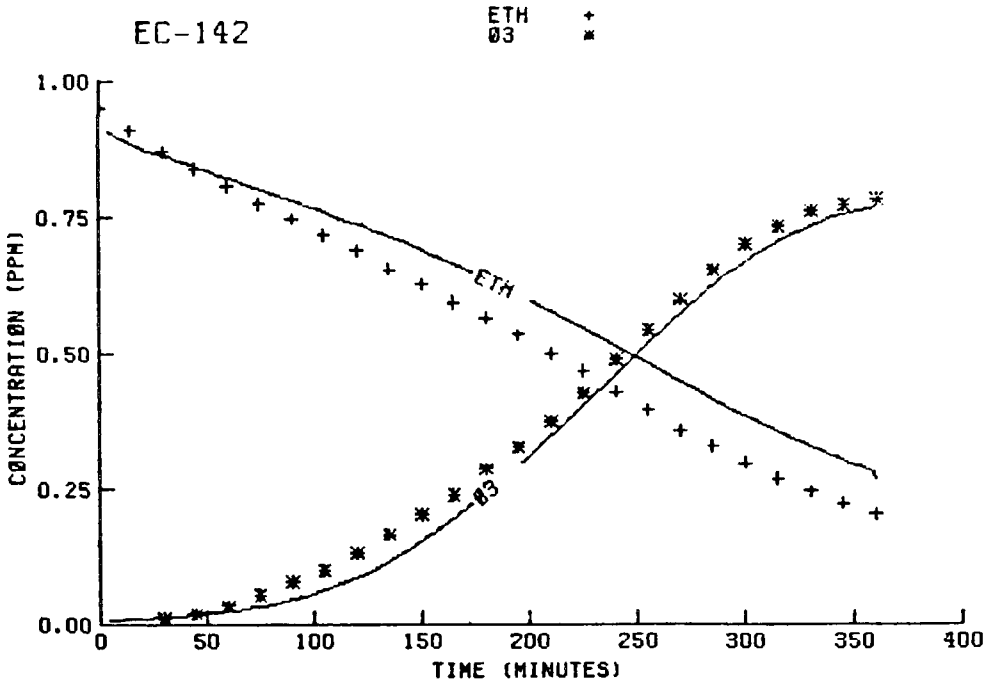

EC-254
Ø3
0.52
0.39
0.26
0.13
0.00
CØNCENTRATIØN (PPM)
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

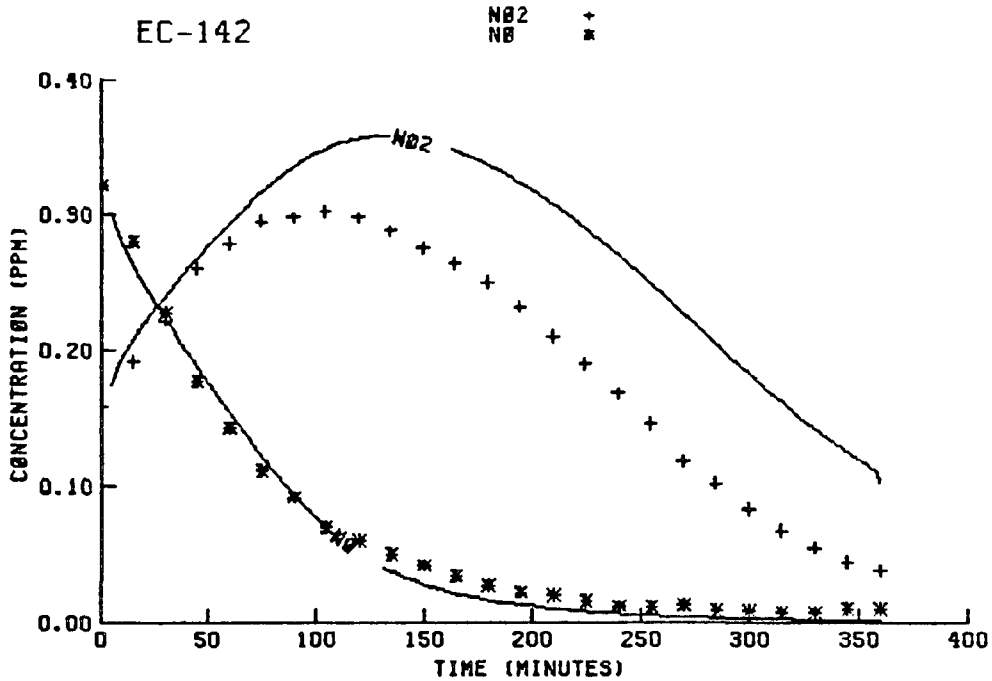

EC-254
NØ2
NØ
0.100
0.075
0.050
0.025
0.000
CØNCENTRATIØN (PPM)
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

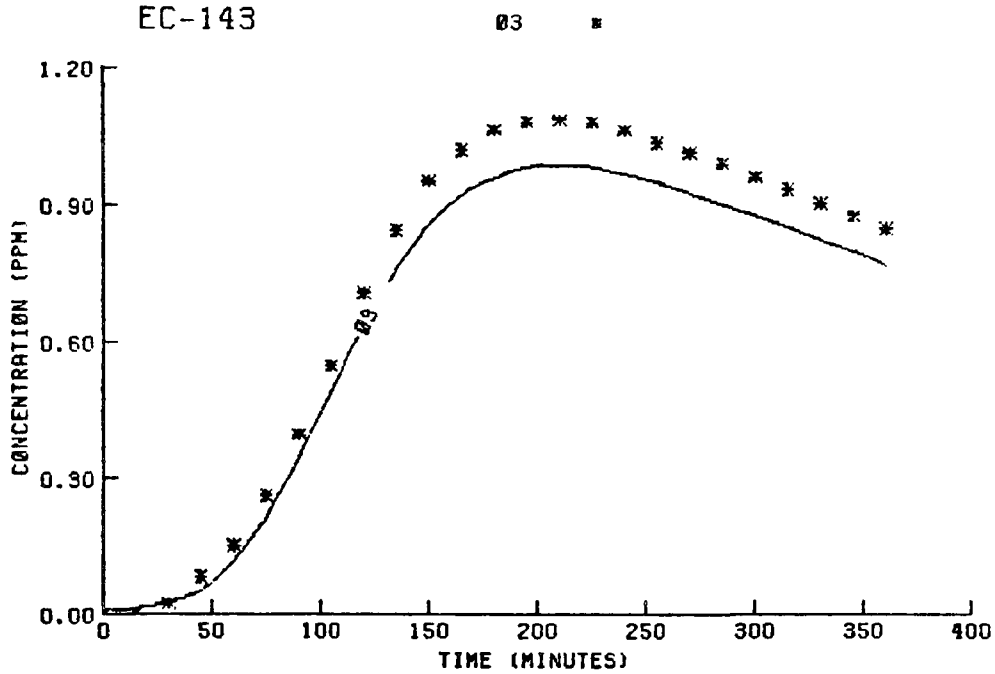

EC-254
BUT
0.0072
0.0066
0.0060
0.0054
0.0048
CONCENTRATION (PPM)
BUT
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

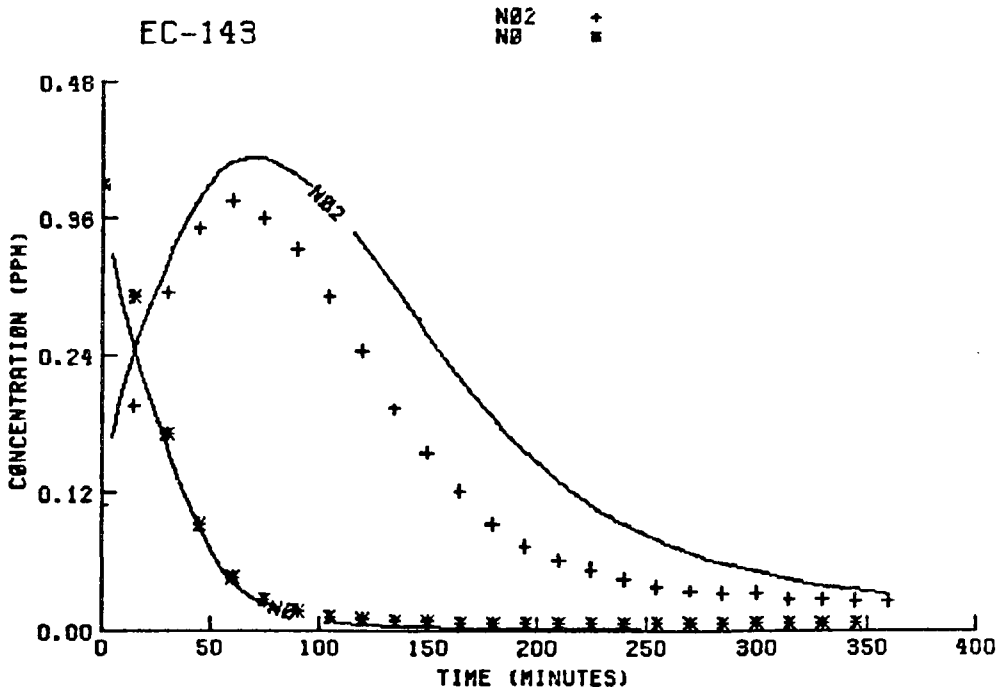

EC-254
PAN
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

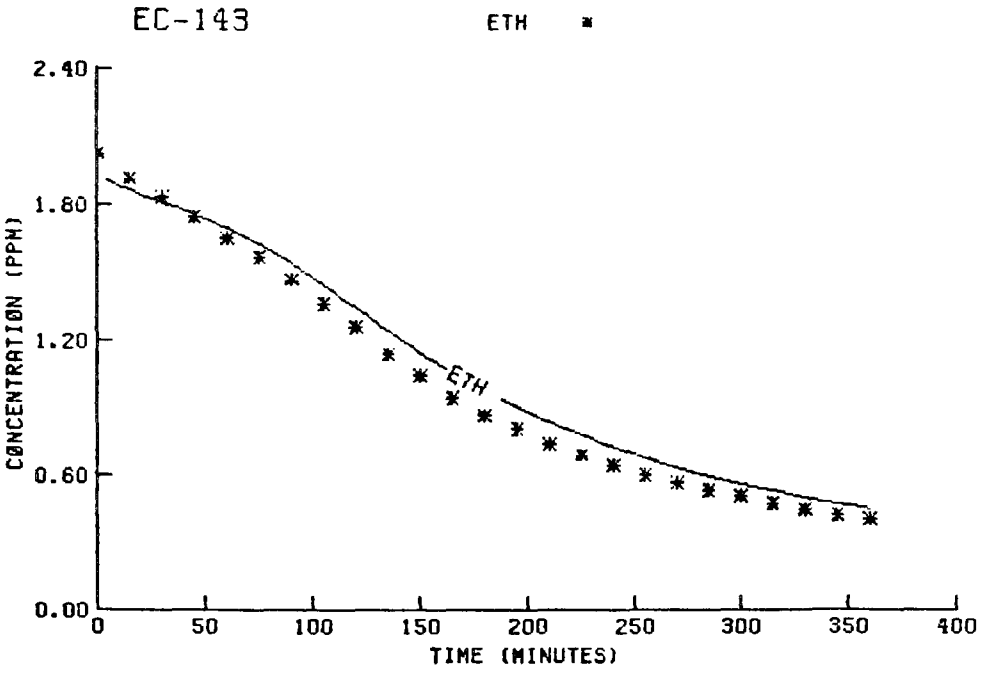
UCR ETHYLENE EXPERIMENTS


EC-142
ETH +
Ø3 *
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
ETH
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

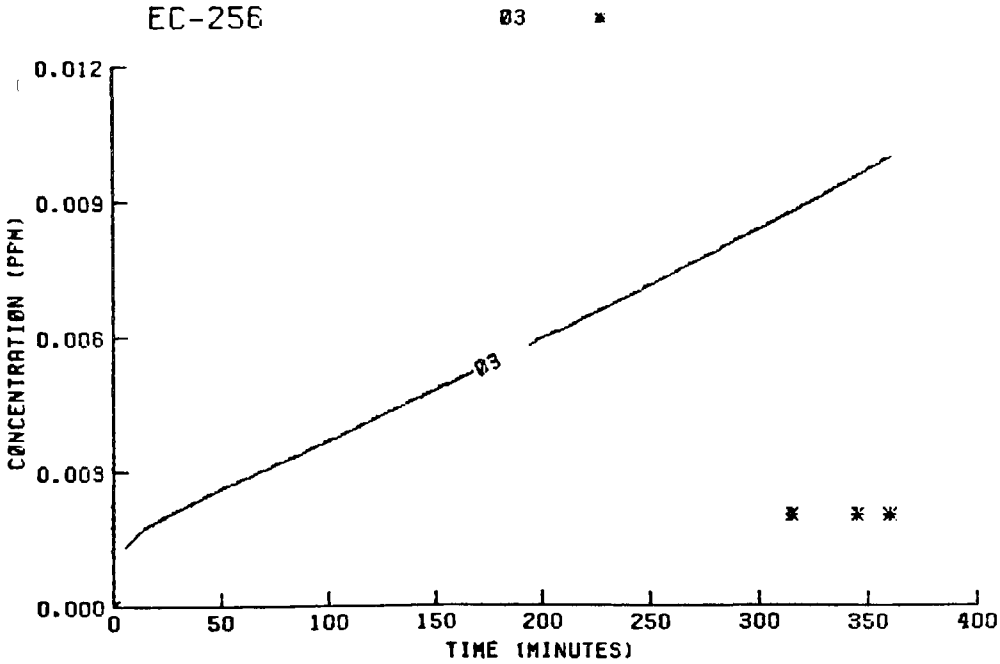

EC-142
NØ2 +
NØ *
0.40
0.30
0.20
0.10
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

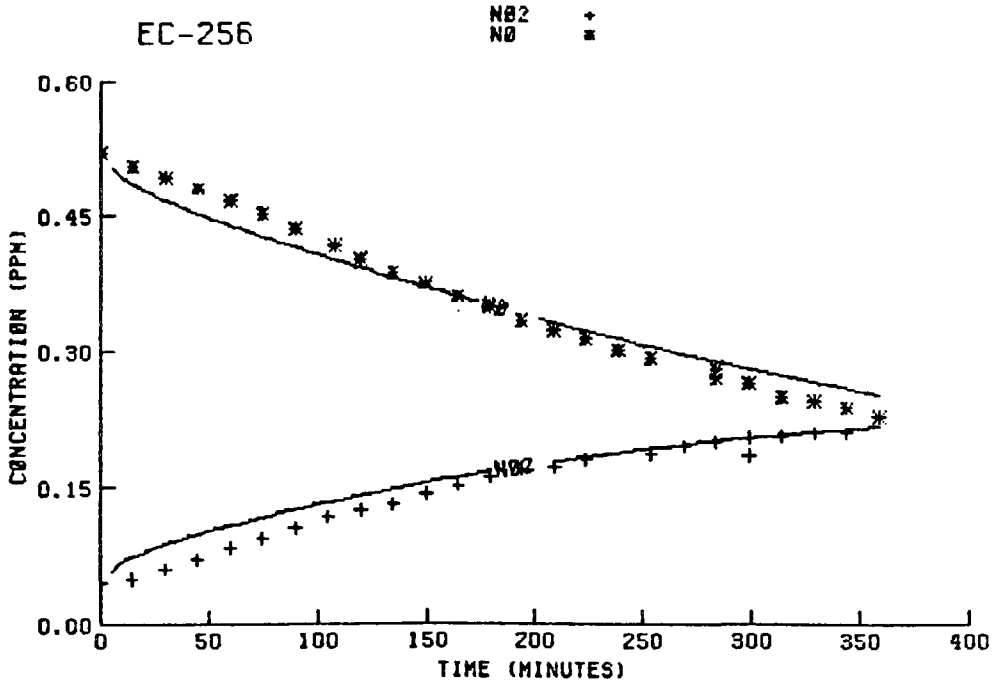

EC-143
Ø3
1.20
0.90
0.60
0.30
0.00
CØNCENTRATIØN (PPM)
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

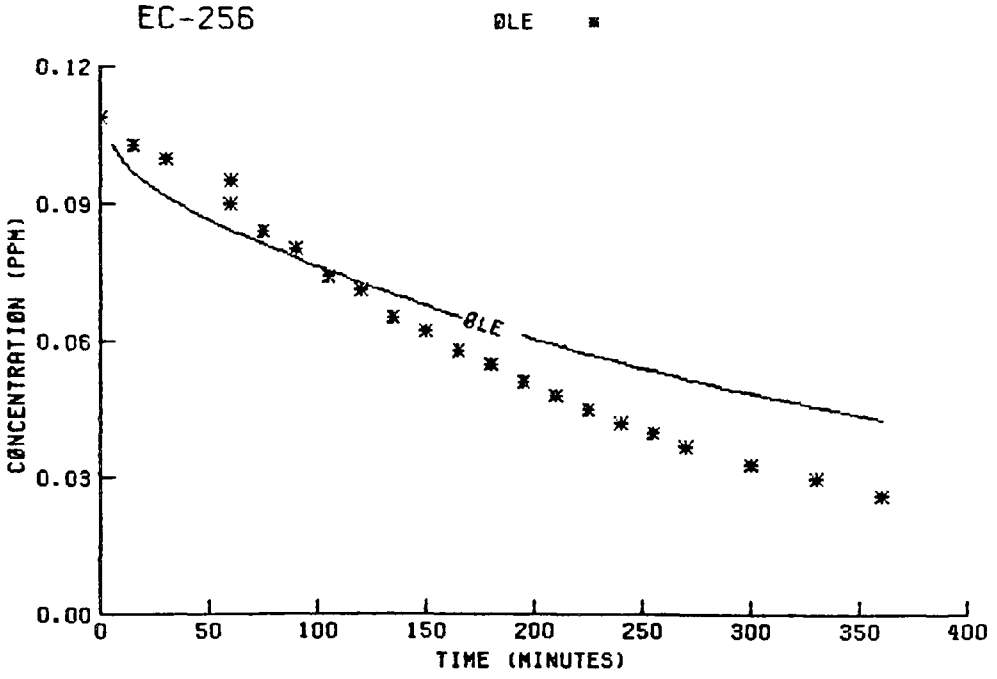

EC-143
NØ2
NØ
0.48
0.96
0.24
0.12
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

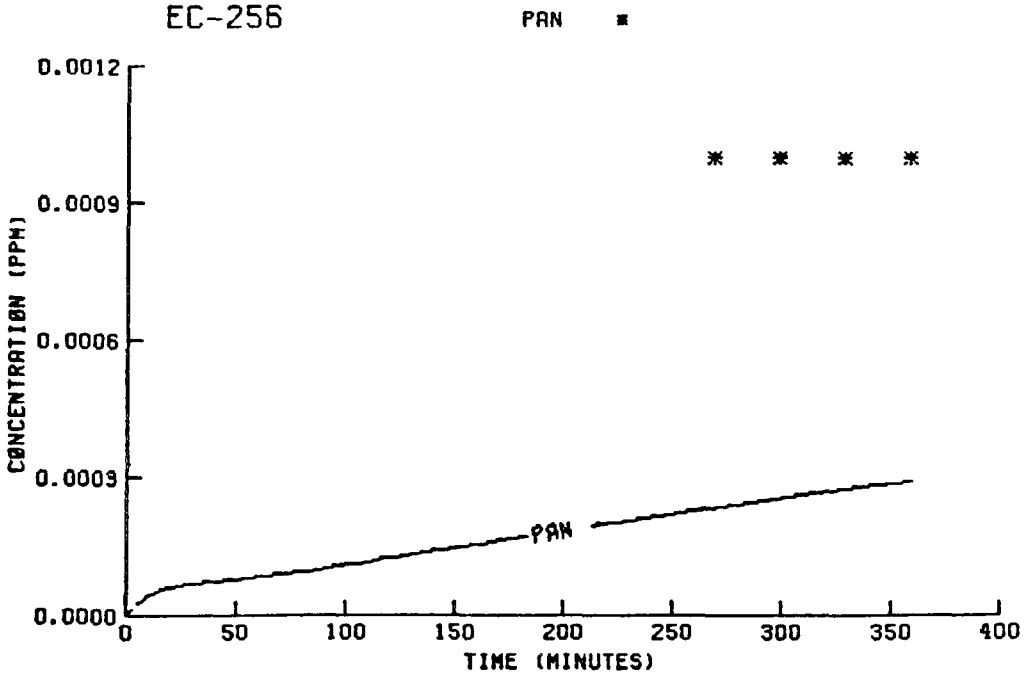

EC-143
ETH
2.40
1.80
1.20
0.60
0.00
CONCENTRATION (PPM)
ETH
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

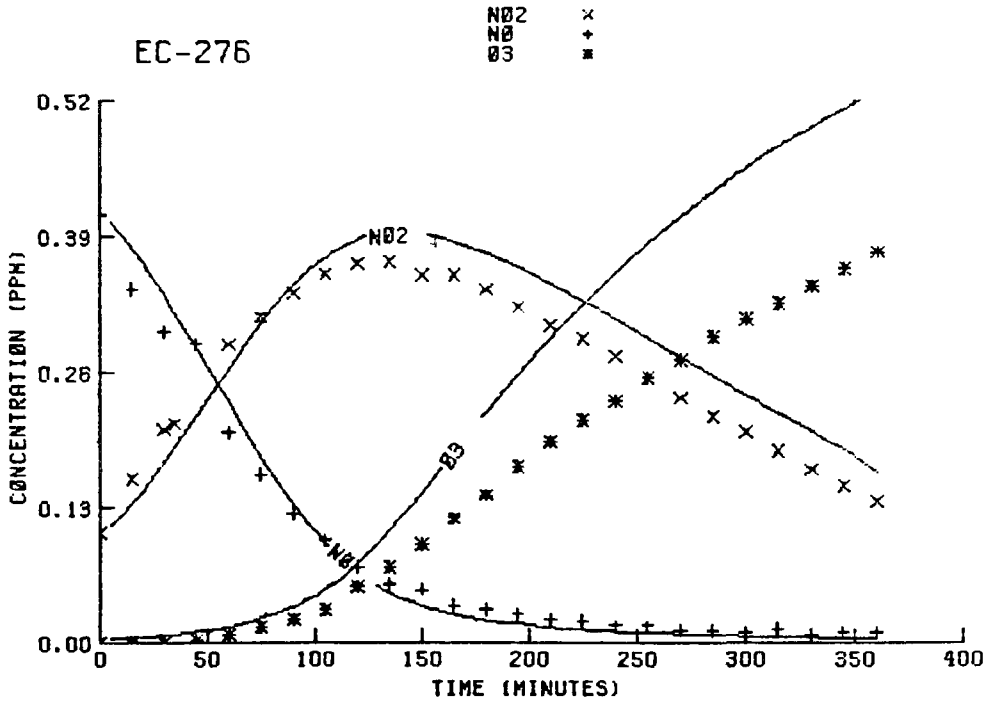
UCR PROPYLENE EXPERIMENTS

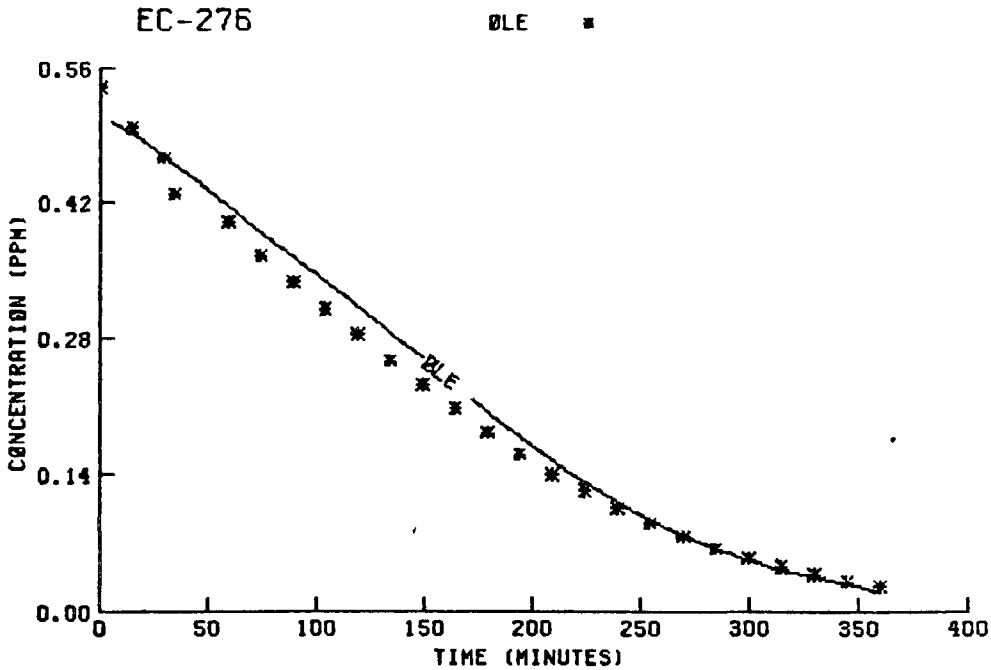

EC-256
Ø3
0.012
0.009
0.006
0.003
0.000
CØNCENTRATIØN (PPM)
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

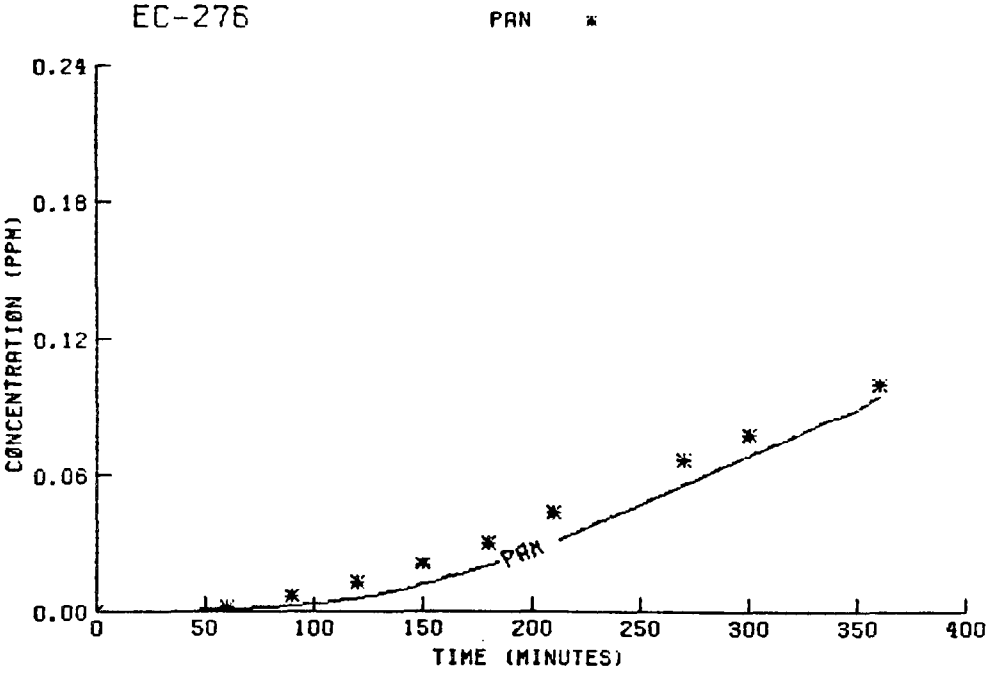

EC-256
NØ2
NØ
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
NØ
NØ2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

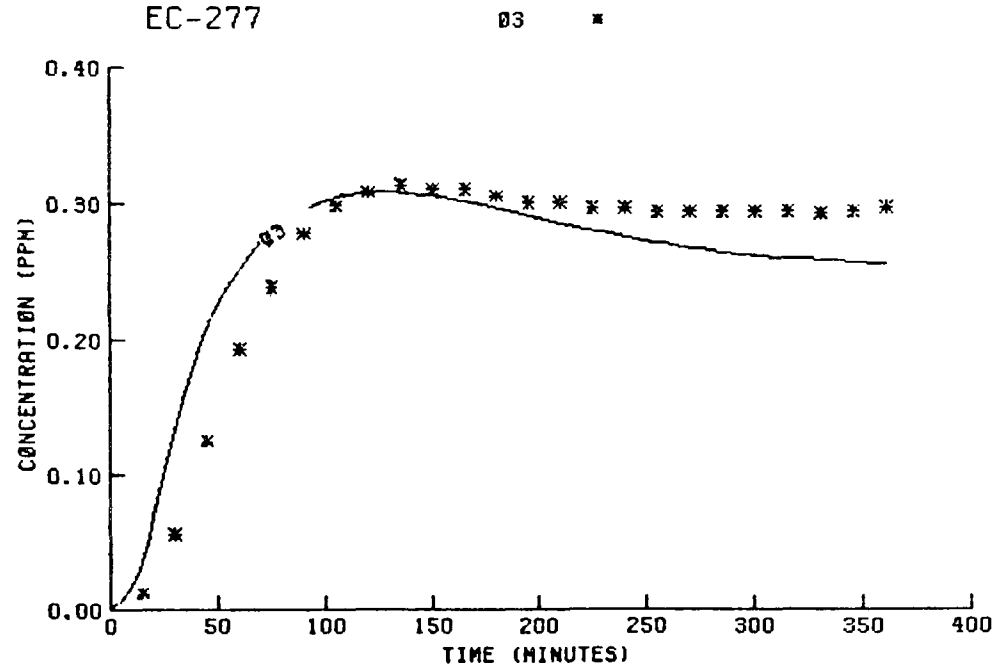

EC-256
ØLE
0.12
0.09
0.06
0.03
0.00
CØNCENTRATIØN (PPM)
ØLE
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

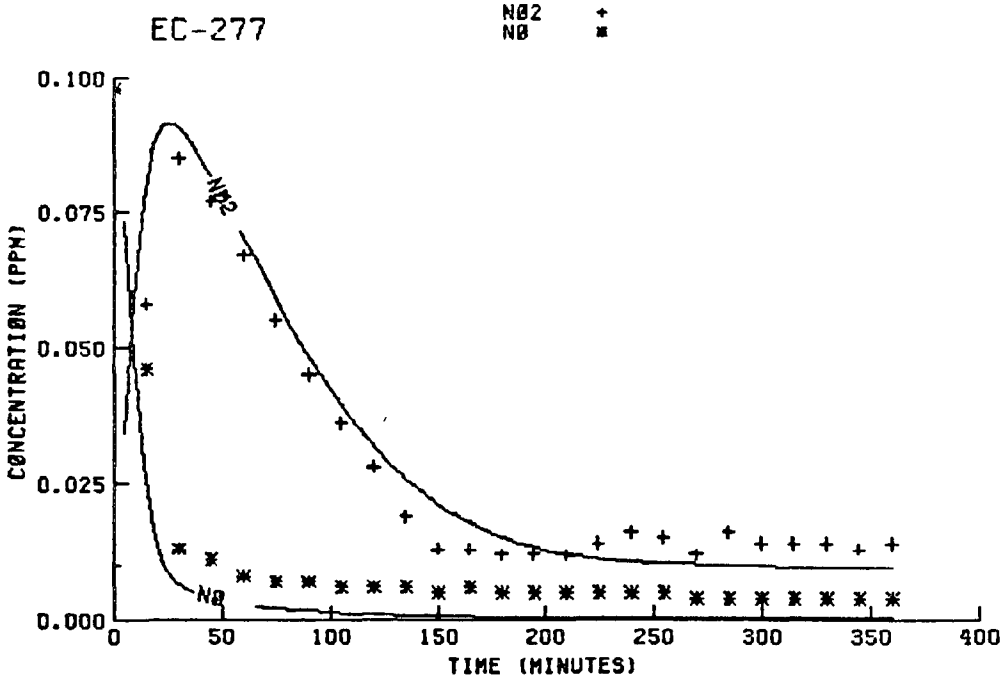

EC-256
PAN
0.0012
0.0009
0.0006
0.0003
0.0000
CØNCENTRATIØN (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

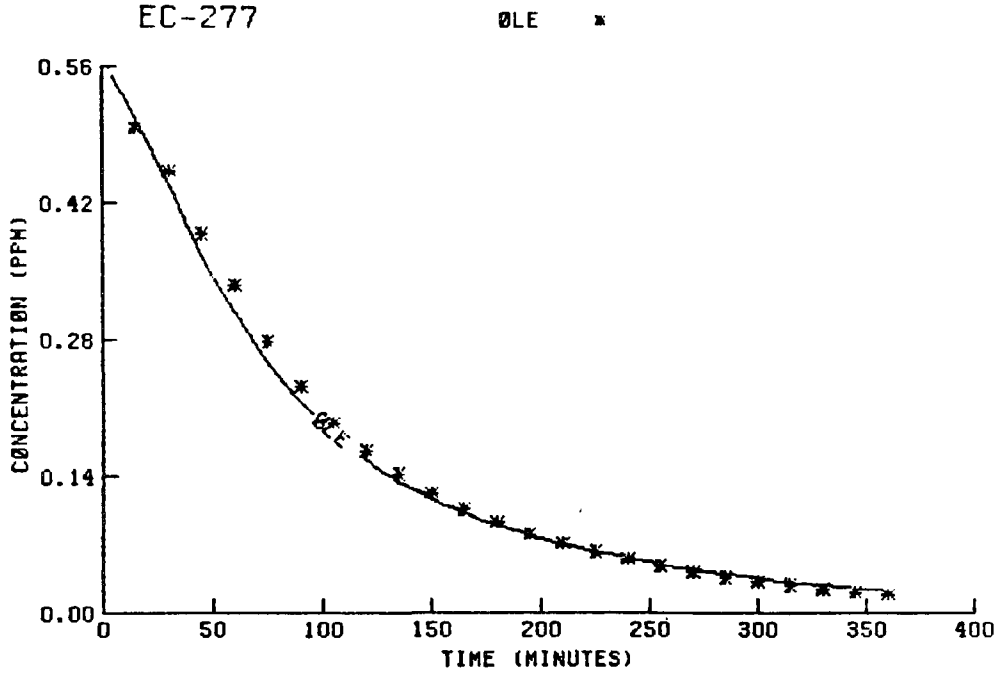

EC-276
NØ2
NØ
Ø3
0.52
0.39
0.26
0.13
0.00
CØNCENTRATIØN (PPH)
NØ2
NØ
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

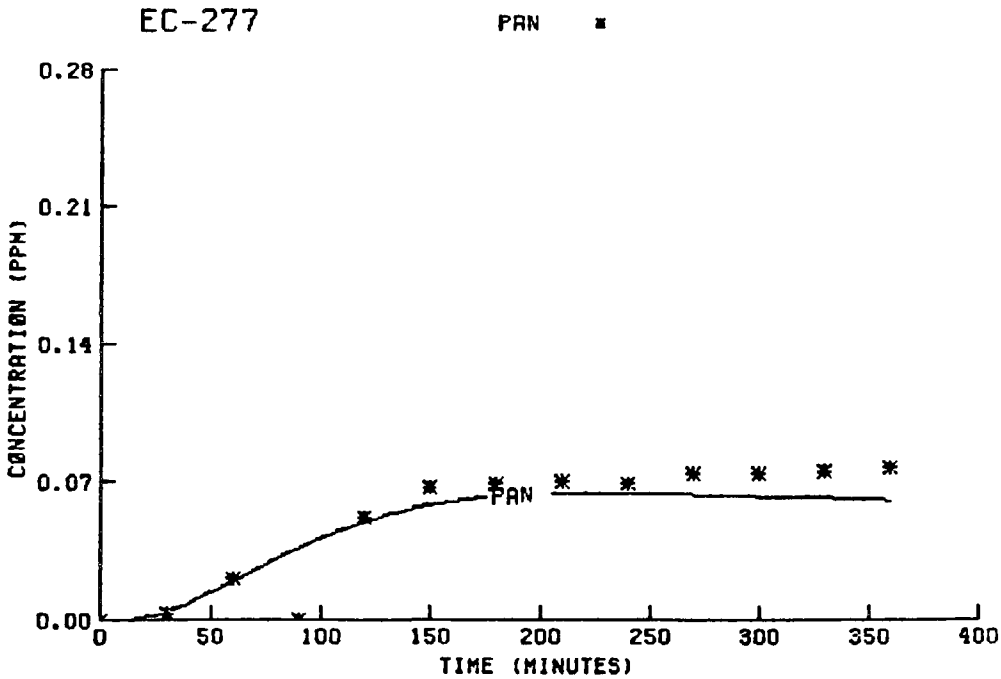

EC-276
ØLE
0.56
0.42
0.28
0.14
0.00
CØNCENTRATIØN (PPH)
ØLE
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

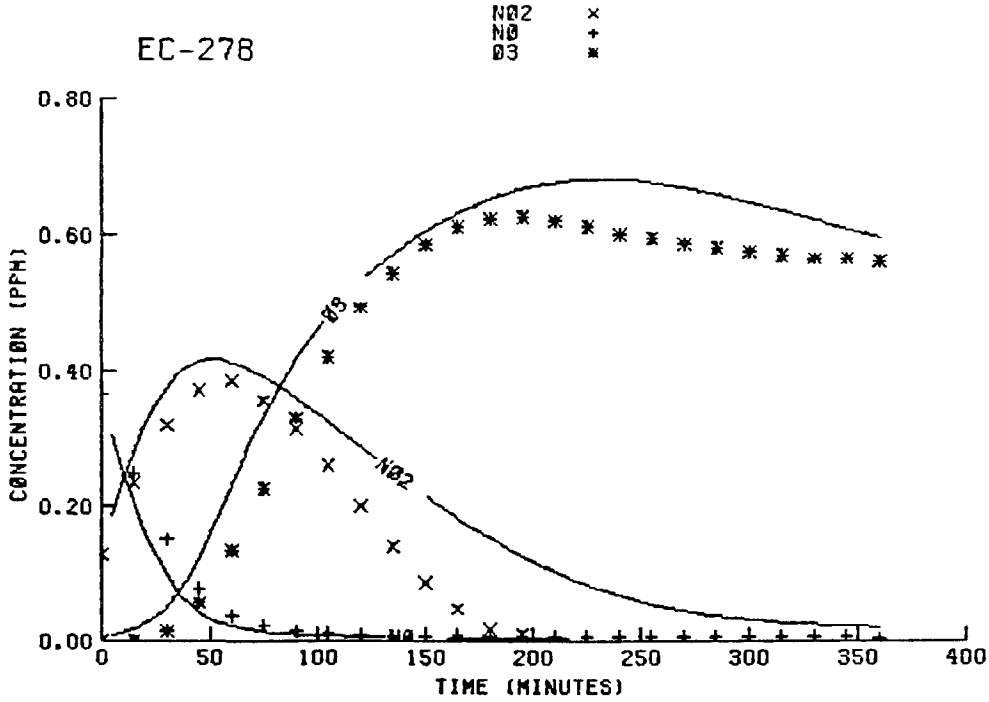

EC-276
PAN
0.24
0.18
0.12
0.06
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
PAN

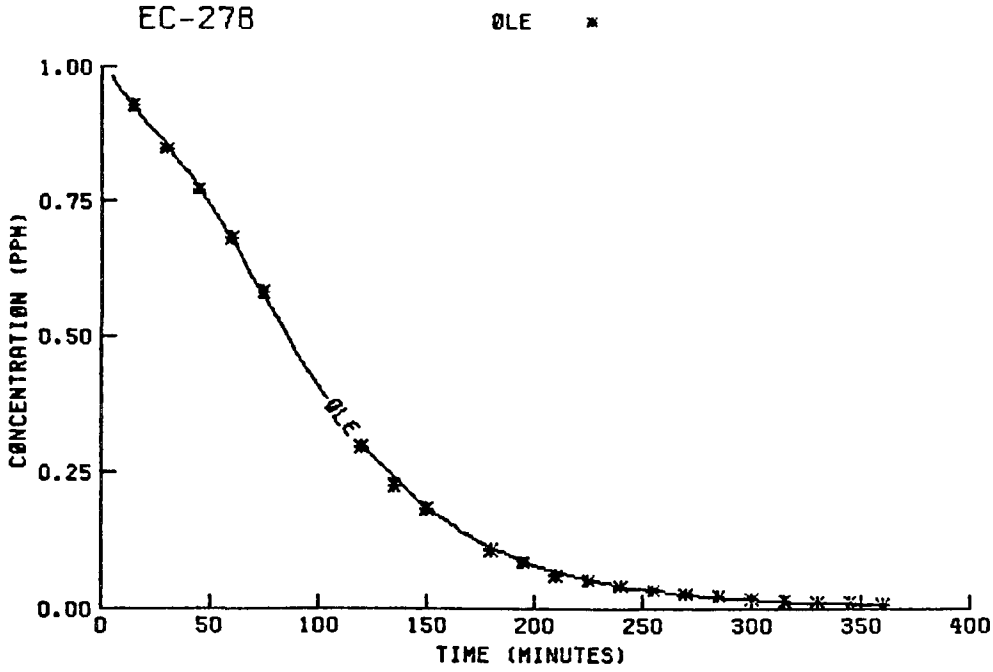

EC-277
Ø3
0.40
0.30
0.20
0.10
0.00
CØNCENTRATIØN (PPM)
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

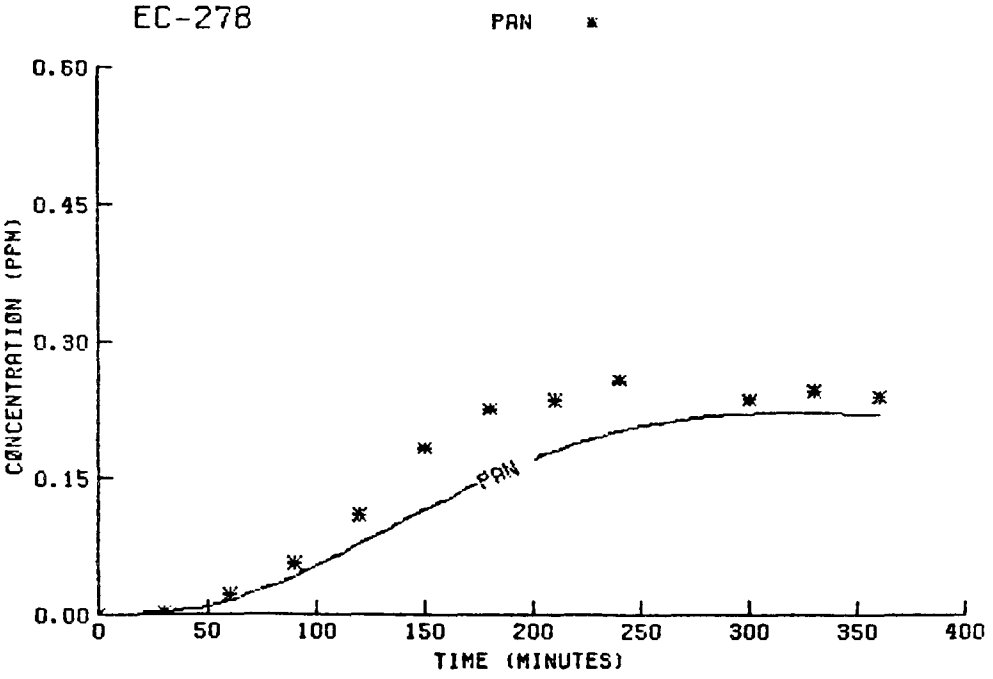

EC-277
NØ2
NØ
0.100
0.075
0.050
0.025
0.000
CØNCENTRATIØN (PPM)
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

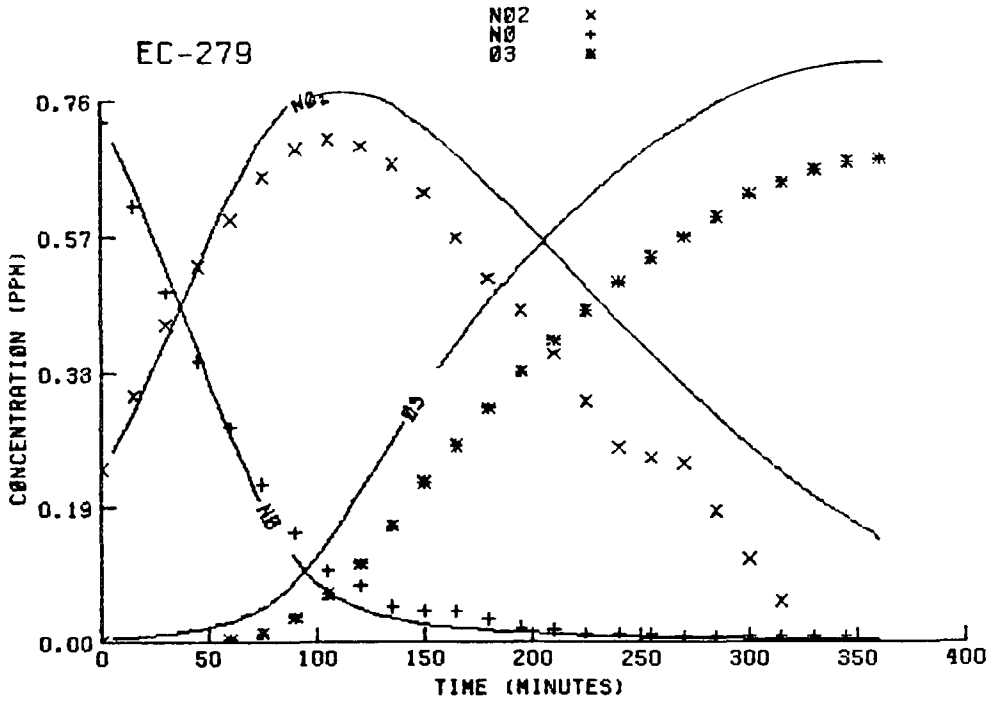

EC-277
ØLE
0.56
0.42
0.28
0.14
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

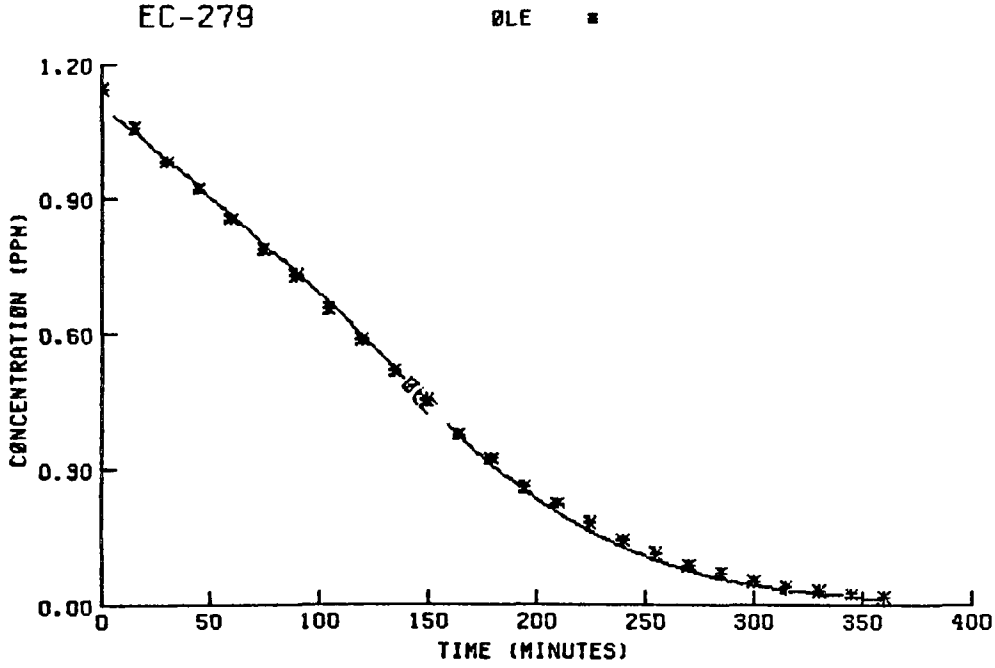

EC-277
PAN
0.28
0.21
0.14
0.07
0.00
CØNCENTRATIØN (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

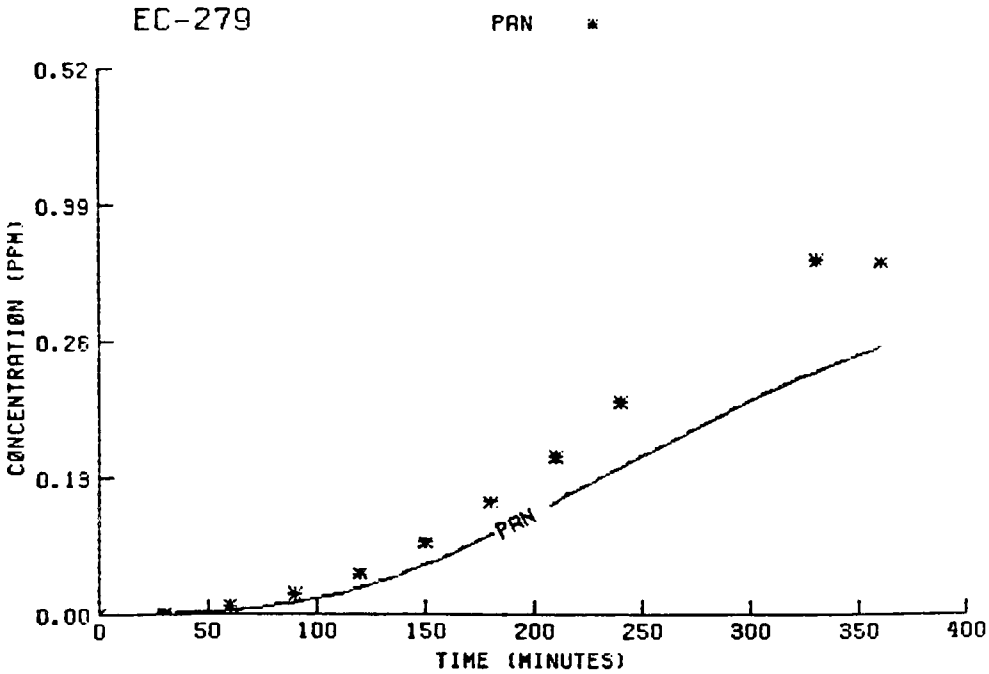

EC-278
NØ2
NØ
Ø3
CØNCENTRATIØN (PPM)
0.80
0.60
0.40
0.20
0.00
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
Ø3
NØ2


EC-278
ØLE
CØNCENTRATIØN (PPM)
1.00
0.75
0.50
0.25
0.00
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
ØLE

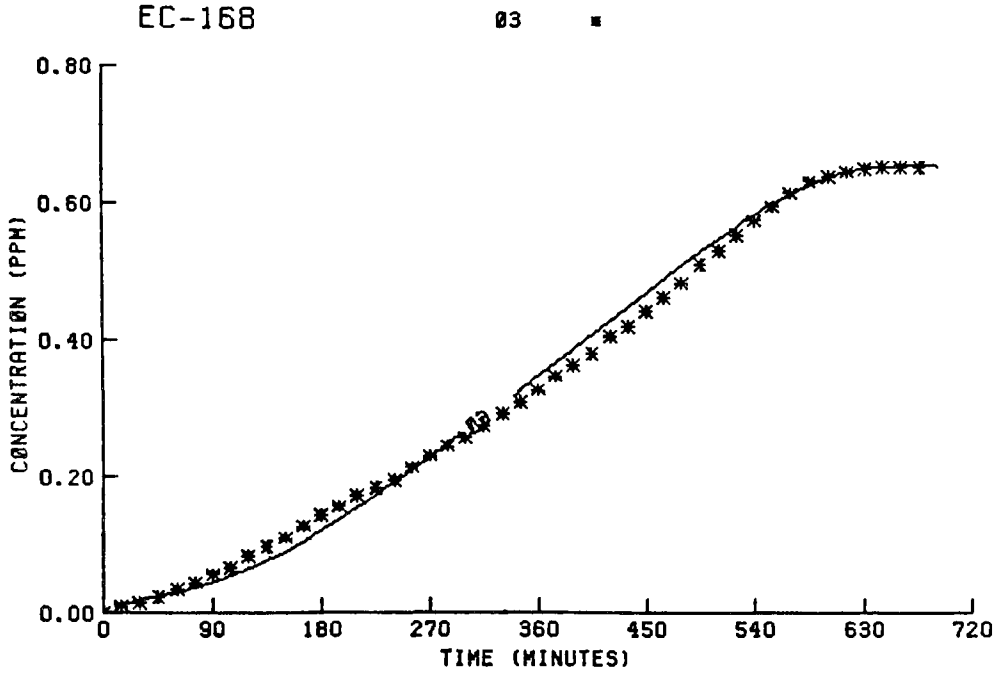

EC-278
PAN
0.60
0.45
0.30
0.15
0.00
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

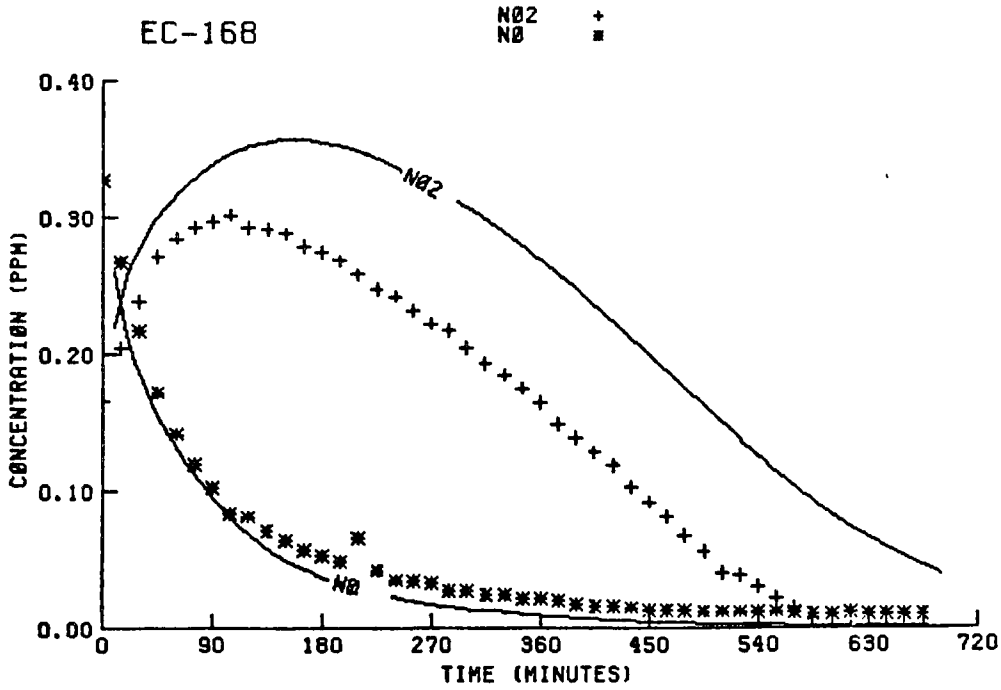

EC-279
NØ2 ×
NØ +
Ø3 ∗
0.76
0.57
0.38
0.19
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

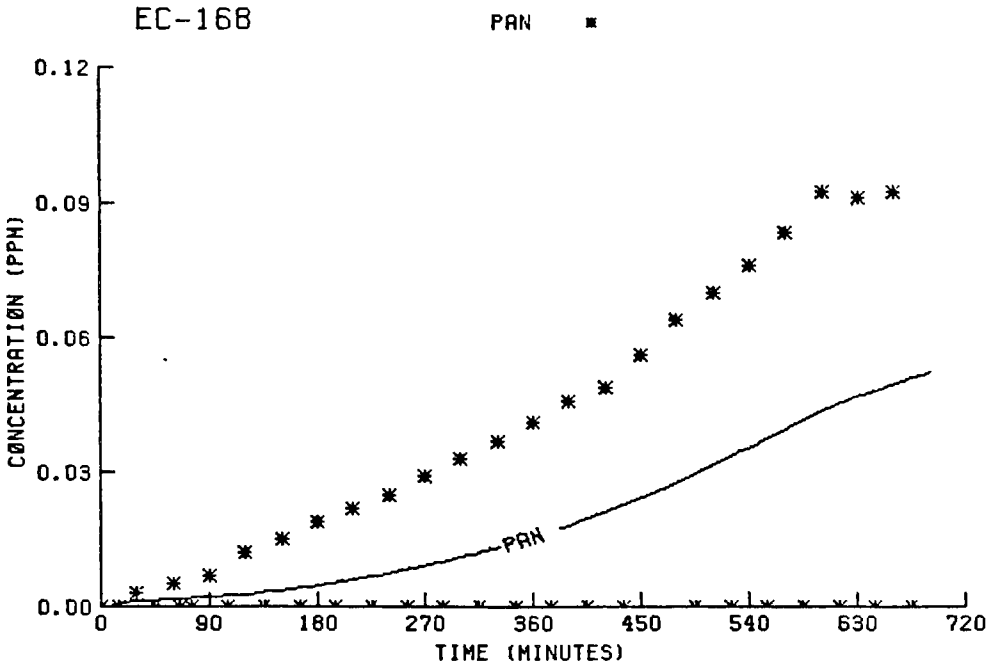

EC-279
ØLE ∗
1.20
0.90
0.60
0.30
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

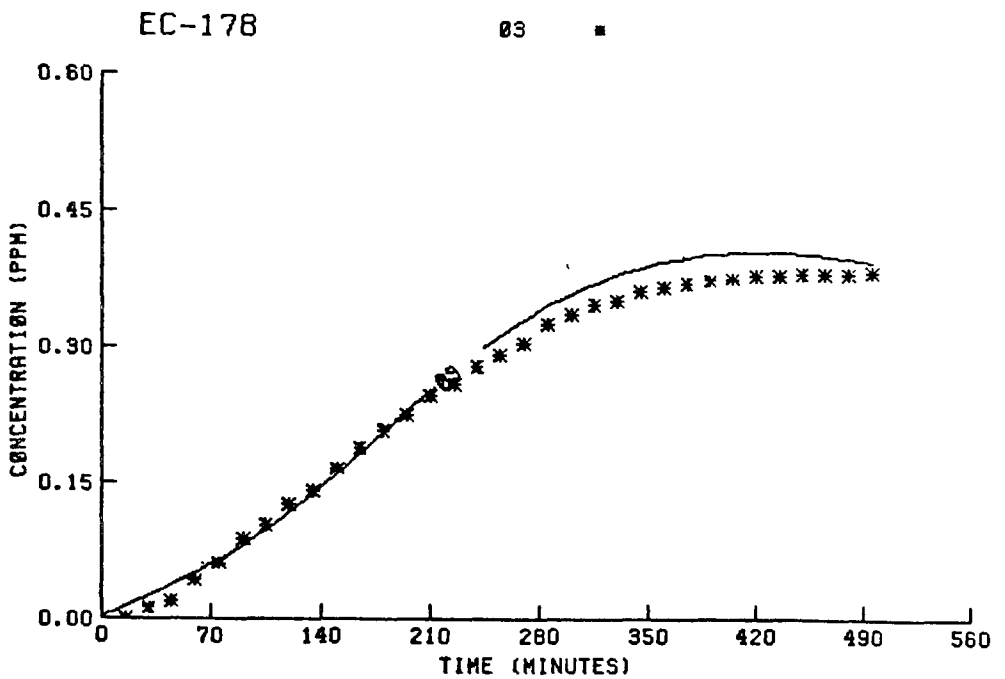

EC-279
PAN
0.52
0.39
0.26
0.13
0.00
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

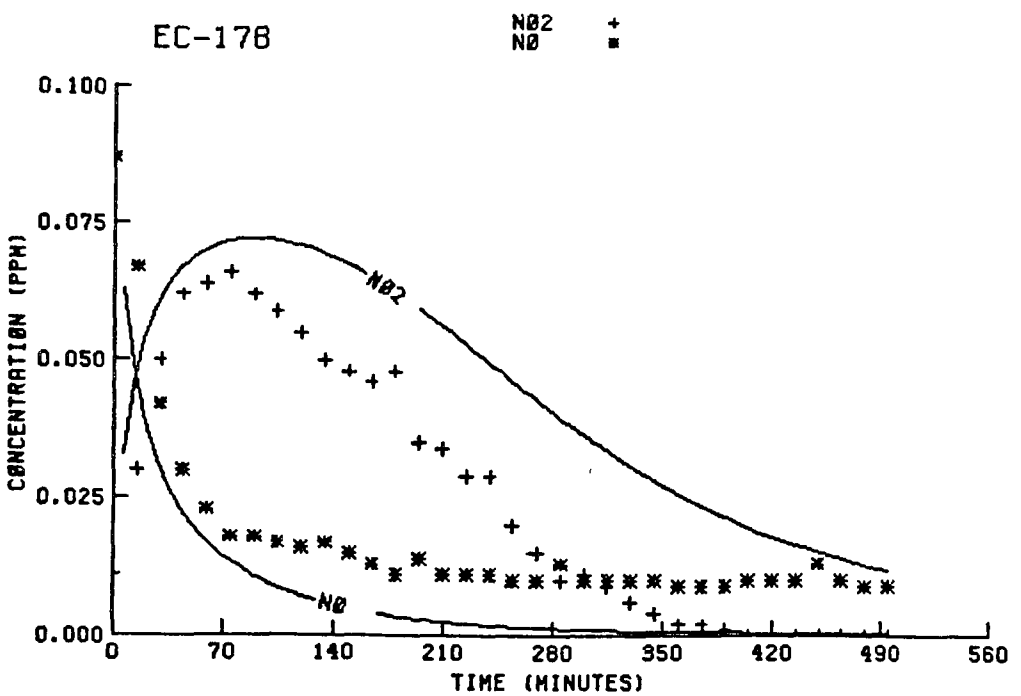
UCR BUTANE EXPERIMENTS

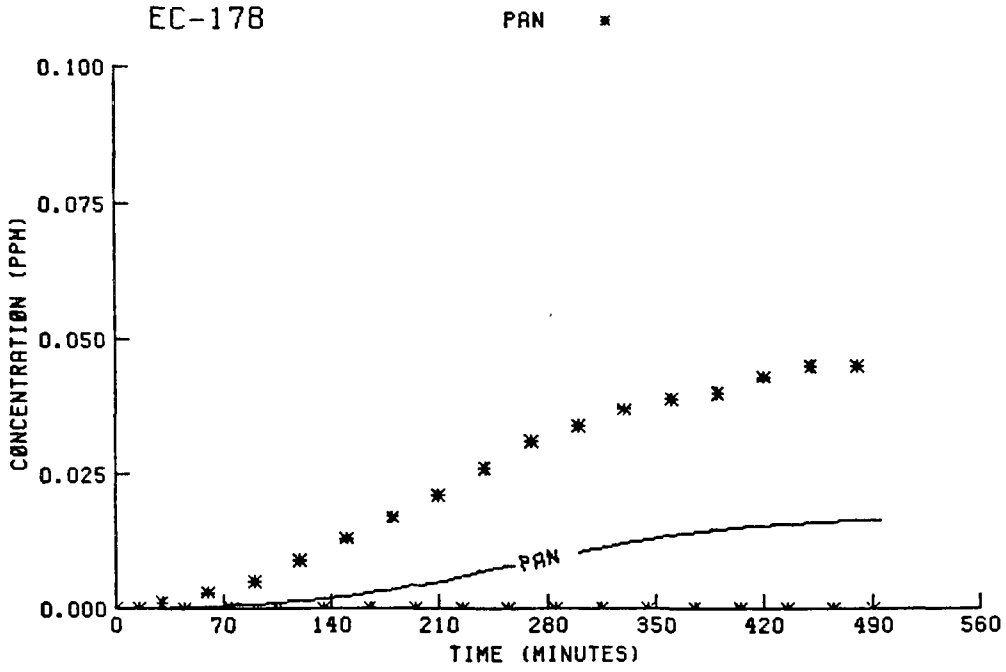

EC-168
Ø3
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
0
90
180
270
360
450
540
630
720
TIME (MINUTES)


EC-168
NØ2
NØ
0.40
0.30
0.20
0.10
0.00
CØNCENTRATIØN (PPM)
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

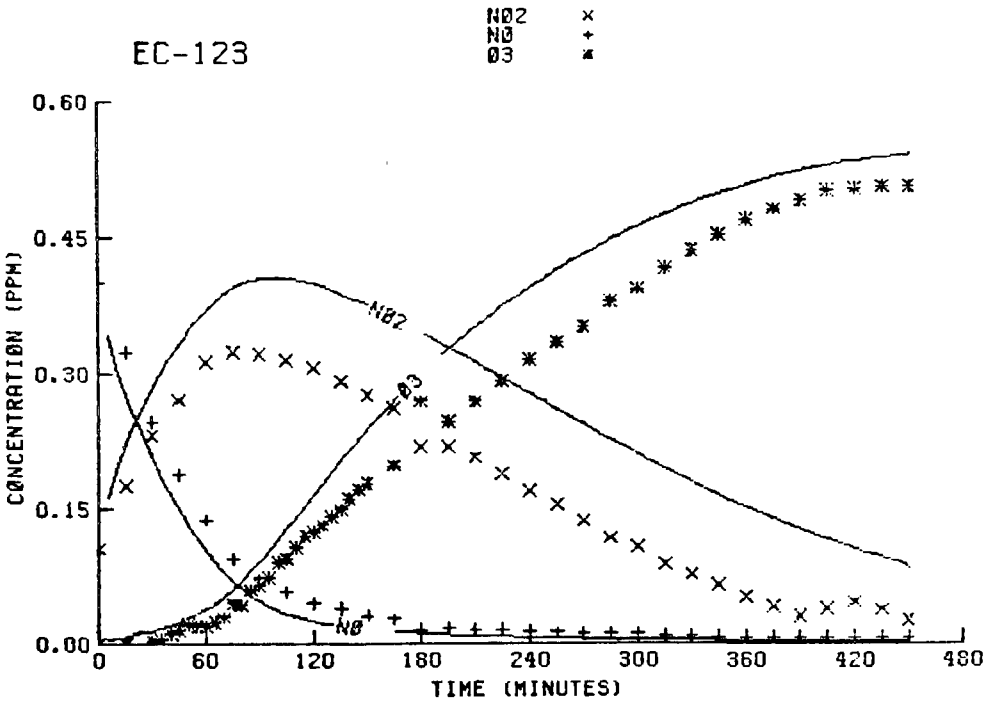

EC-168
PAN
0.12
0.09
0.06
0.03
0.00
CONCENTRATION (PPM)
PAN
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

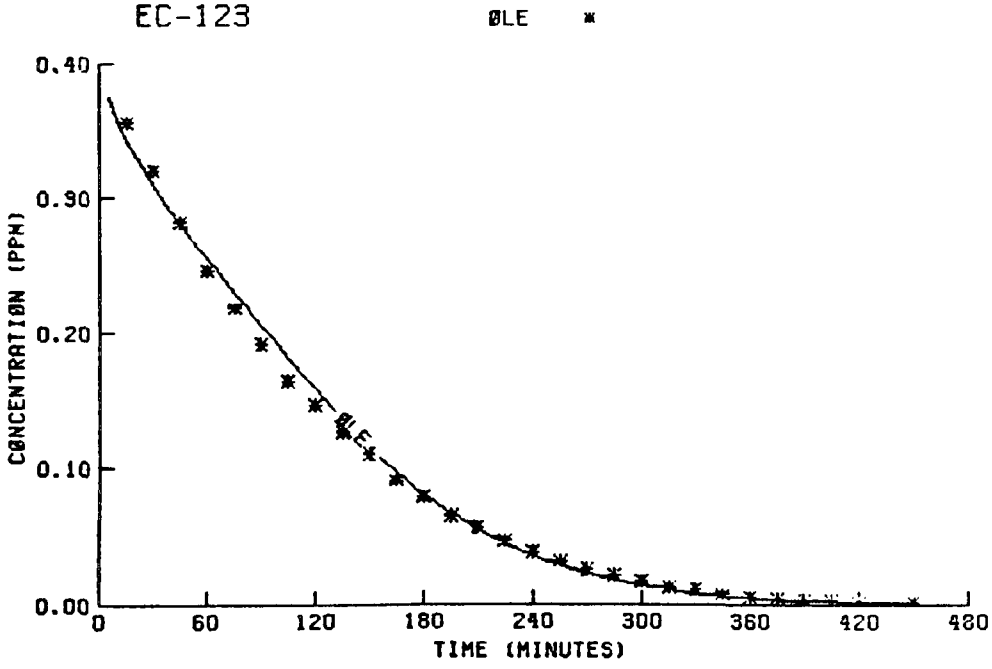

EC-178
Ø3
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
0
70
140
210
280
350
420
490
560
TIME (MINUTES)

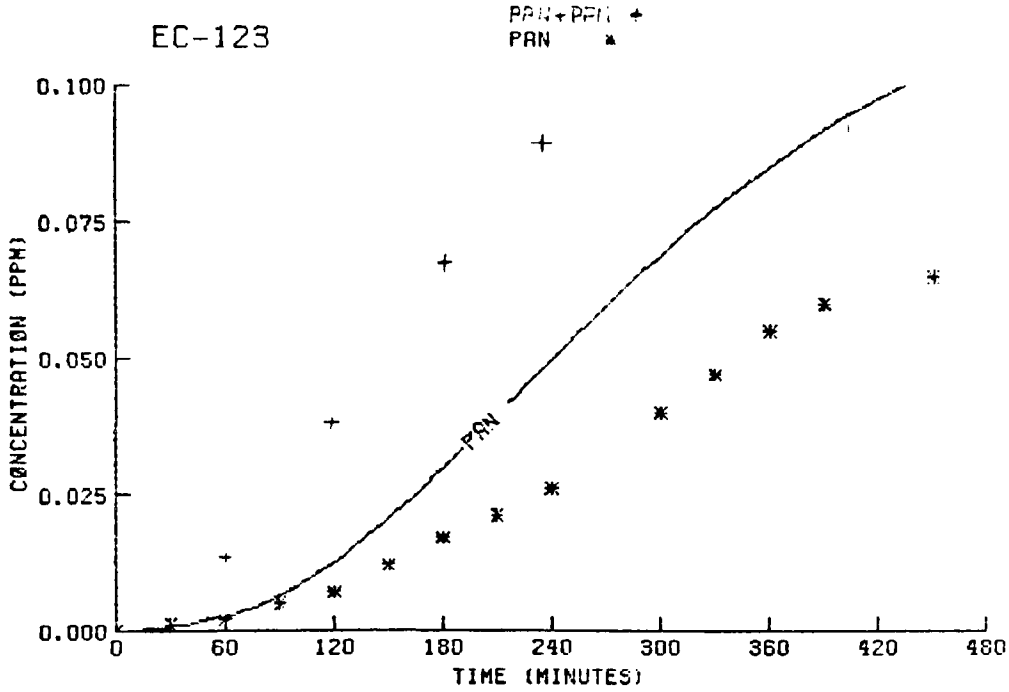

EC-178
NØ2
NØ
0.100
0.075
0.050
0.025
0.000
CØNCENTRATIØN (PPM)
NØ2
NØ
0
70
140
210
280
350
420
490
560
TIME (MINUTES)


EC-178
PAN
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
PAN
0
70
140
210
280
350
420
490
560
TIME (MINUTES)

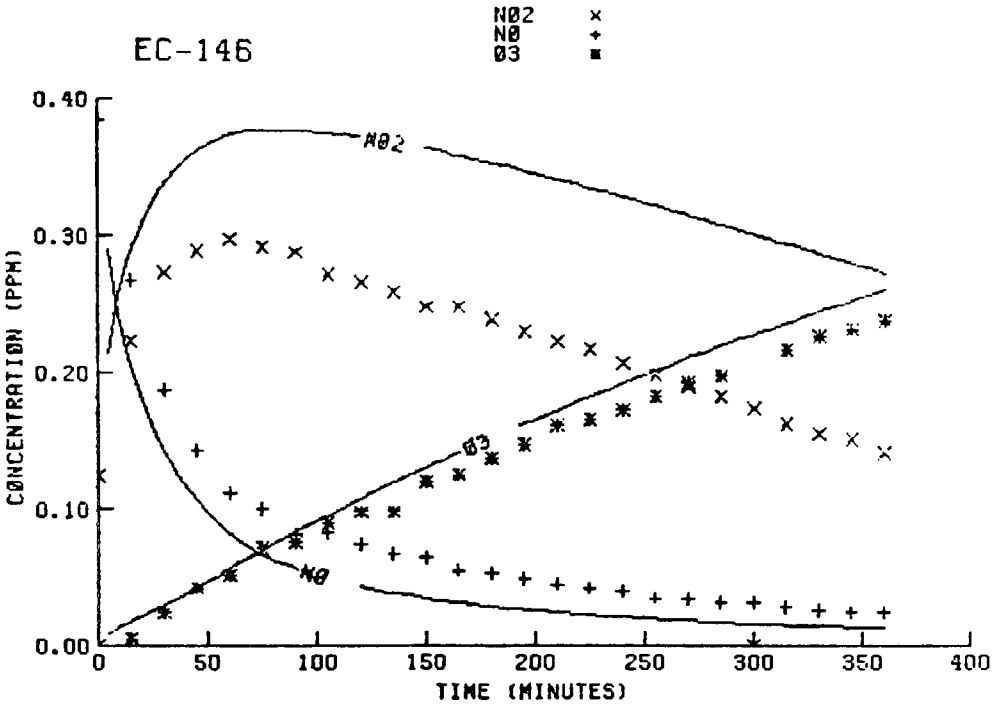
UCR 1-BUTENE EXPERIMENTS

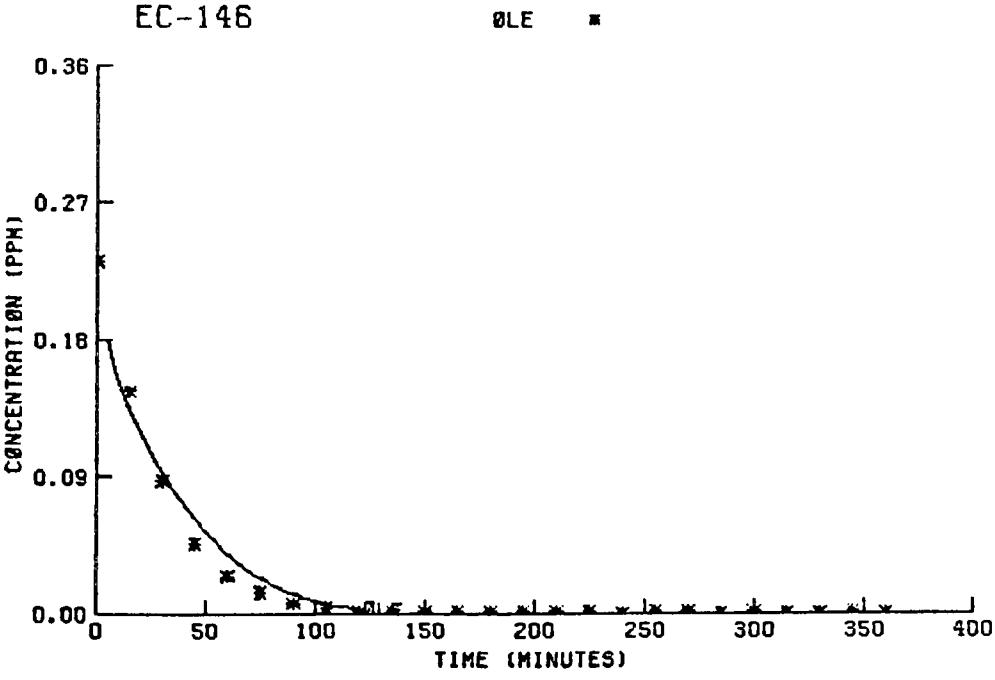

EC-123
NØ2
NØ
Ø3
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

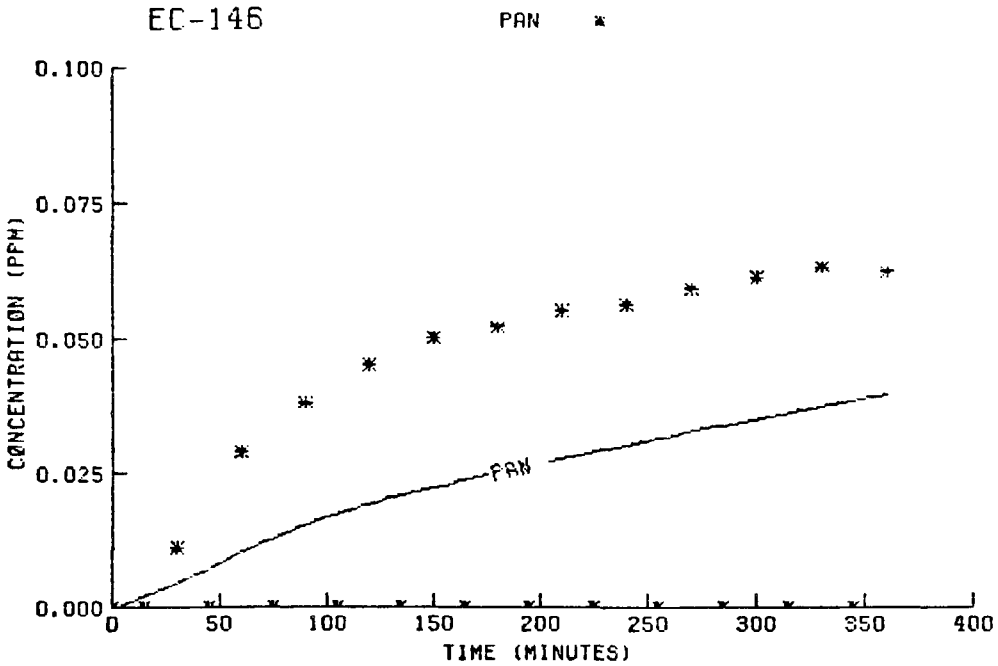

EC-123
ØLE
0.40
0.30
0.20
0.10
0.00
CØNCENTRATIØN (PPM)
0
60
120
180
240
300
360
420
480
TIME (MINUTES)


EC-123
PAN+PPN
PAN
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
PAN
0
60
120
180
240
300
360
420
480
TIME (MINUTES)

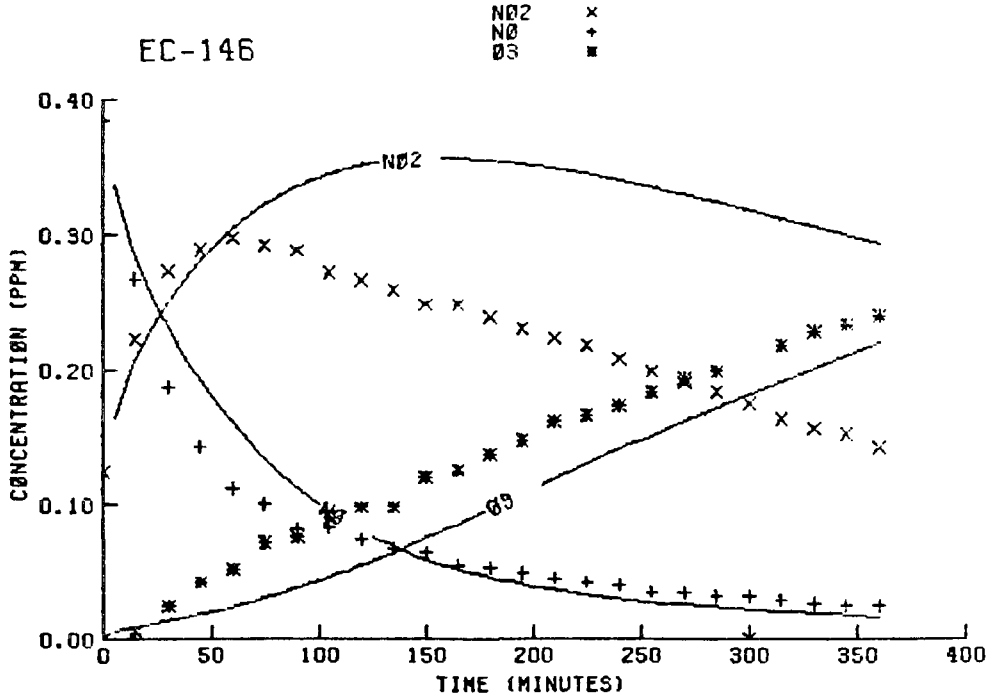
UCR TRANS-2-BUTENE EXPERIMENTS
(With trans-2-butene treated as an olefin)

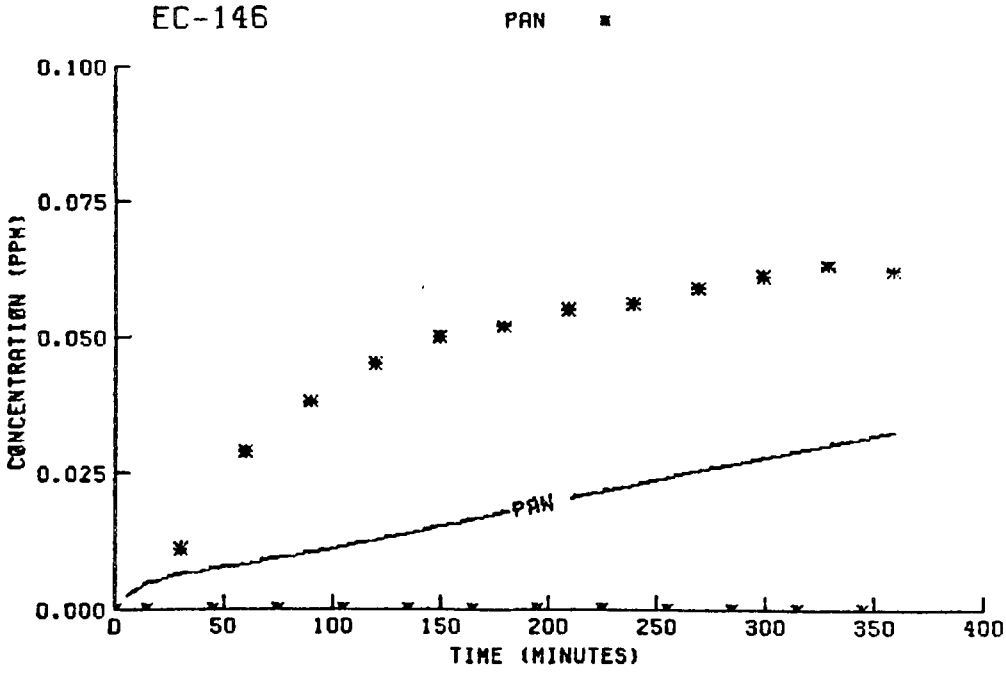

EC-146
NØ2 ×
NØ +
Ø3 ■
0.40
0.30
0.20
0.10
0.00
CØNCENTRATIØN (PPM)
NØ2
Ø3
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-146
ØLE ■
0.36
0.27
0.18
0.09
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

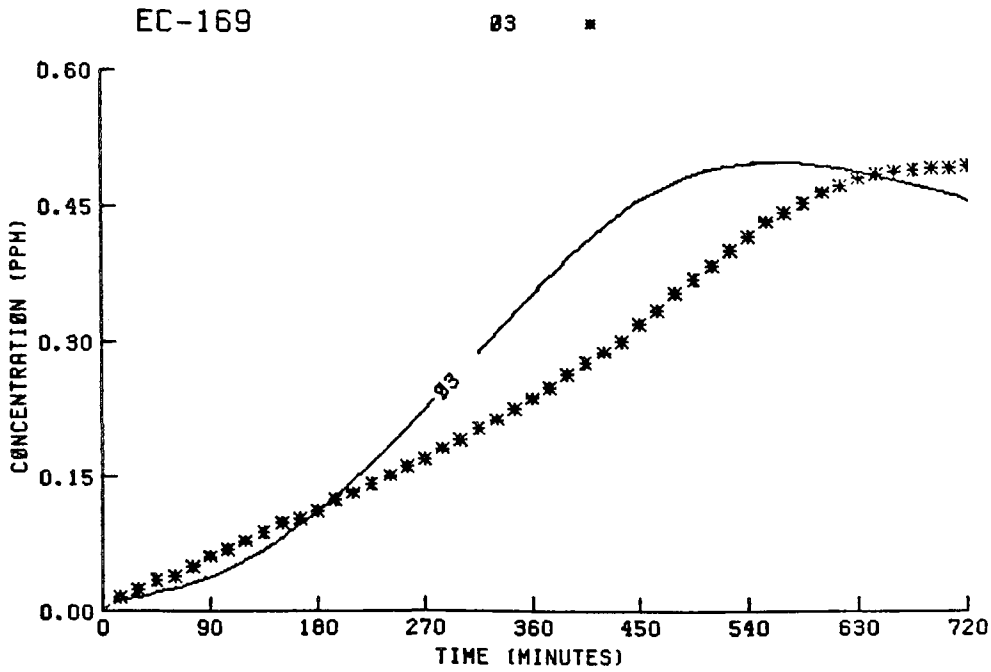

EC-146
PAN
0.100
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

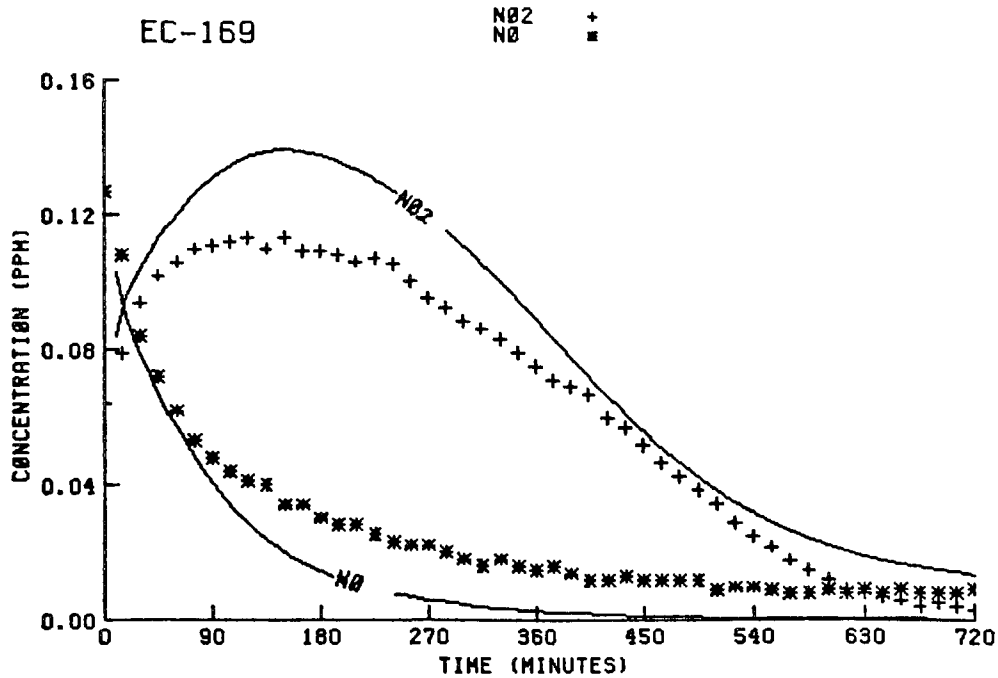
UCR TRANS-2-BUTENE EXPERIMENTS
(with trans-2-butene treated as a carbonyl)

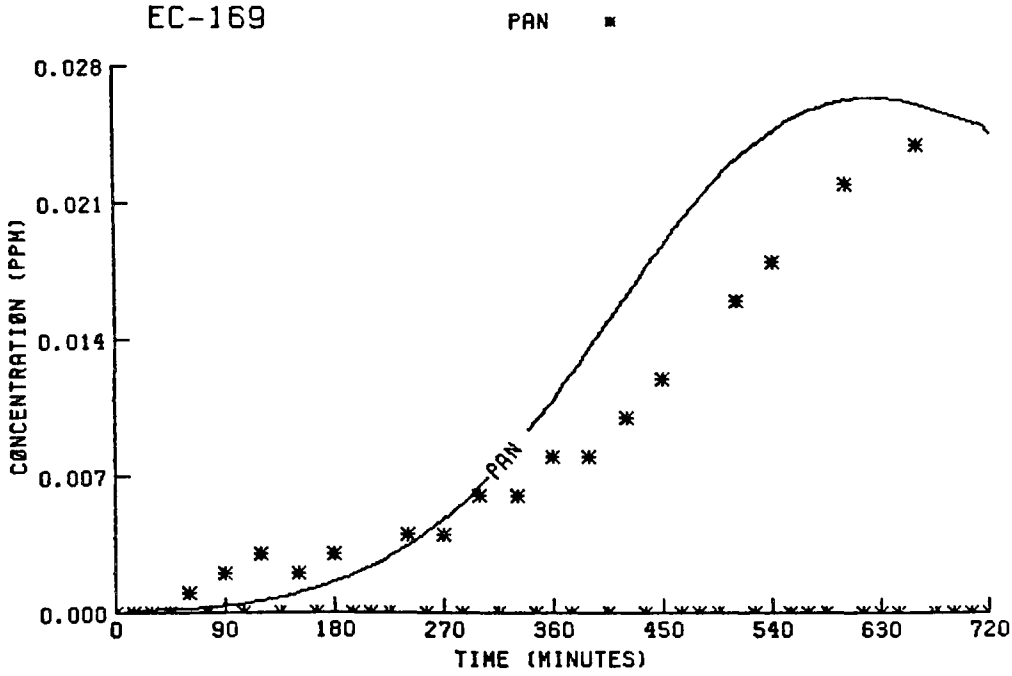

EC-146
NØ2
NØ
Ø3
0.40
0.30
0.20
0.10
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-146
PAN
0.100
0.075
0.050
0.025
0.000
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

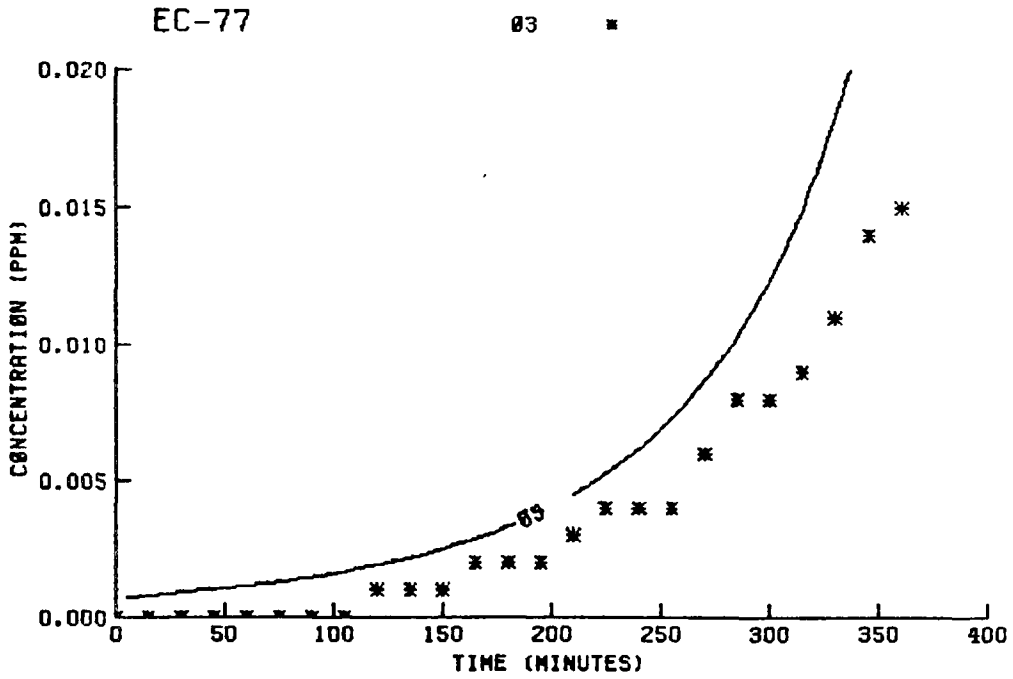
UCR 2,3-DIMETHYLBUTANE EXPERIMENTS

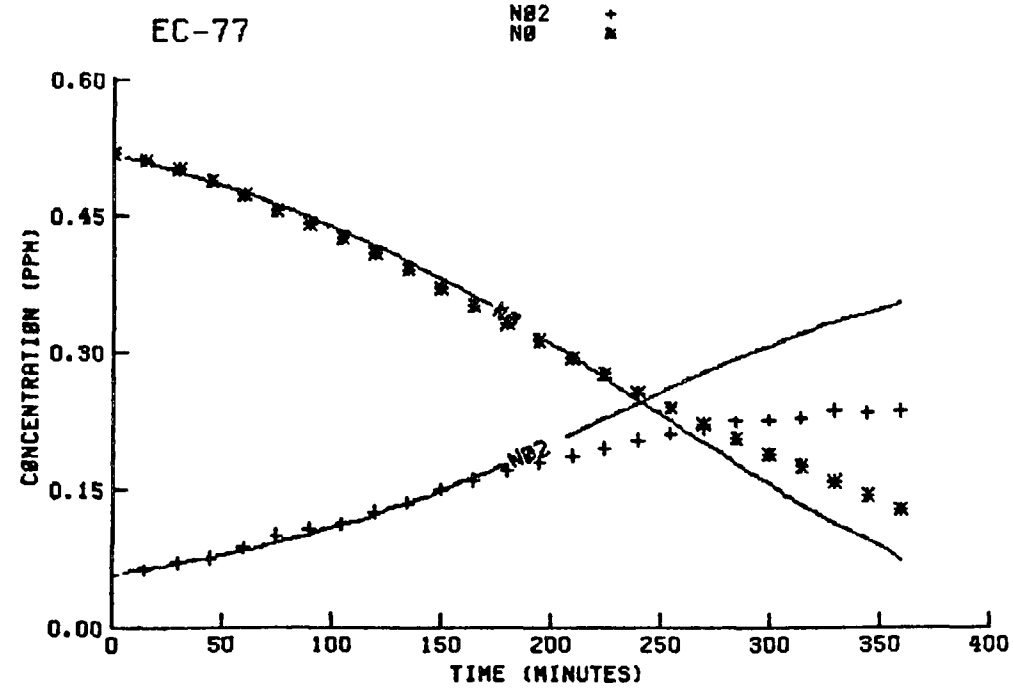

EC-169
Ø3
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
Ø3
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

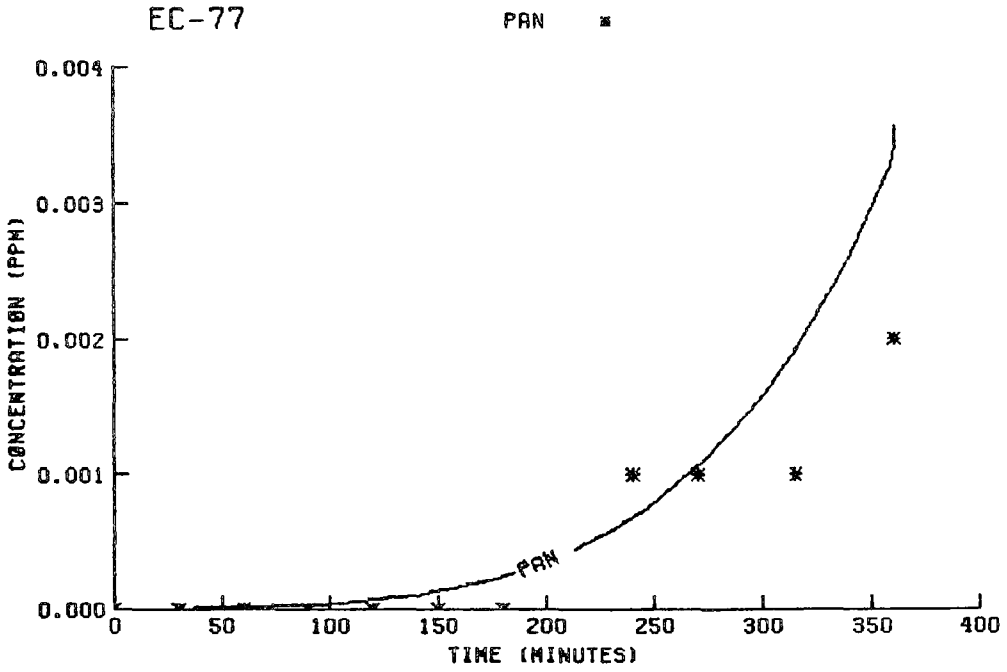

EC-169
NØ2
NØ
0.16
0.12
0.08
0.04
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

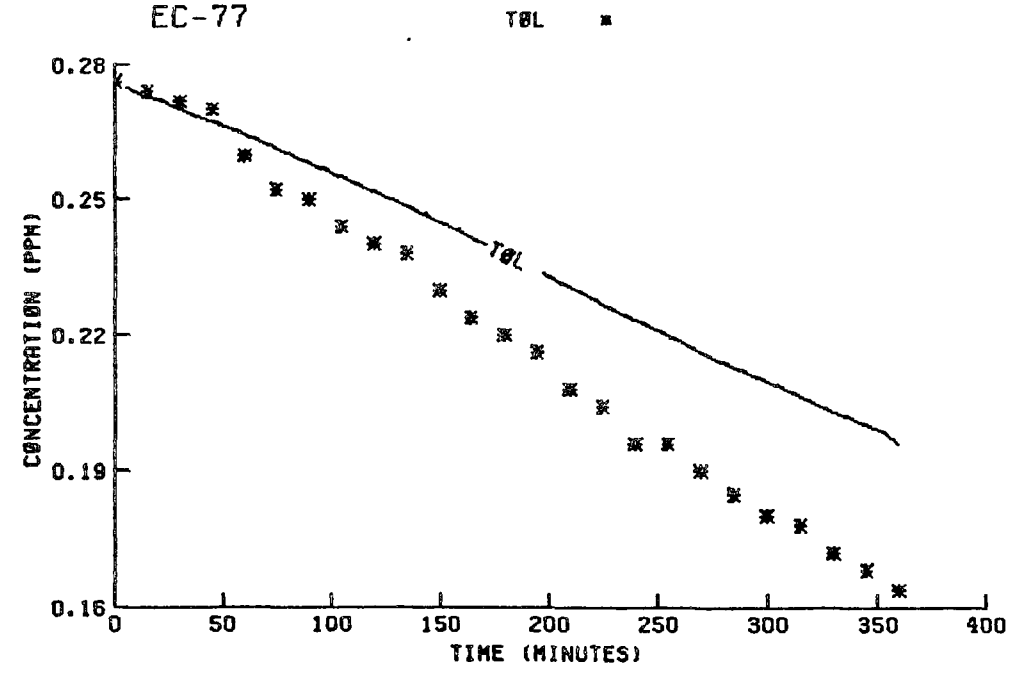

EC-169
PAN
0.028
0.021
0.014
0.007
0.000
CONCENTRATION (PPM)
PAN
0
90
180
270
360
450
540
630
720
TIME (MINUTES)

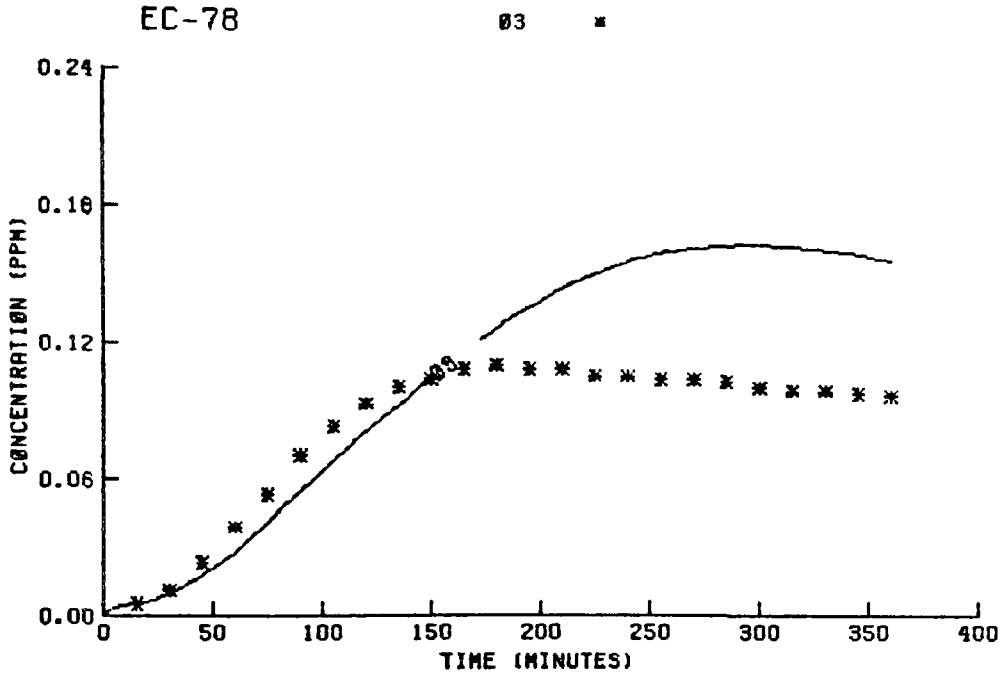
UCR TOLUENE EXPERIMENTS

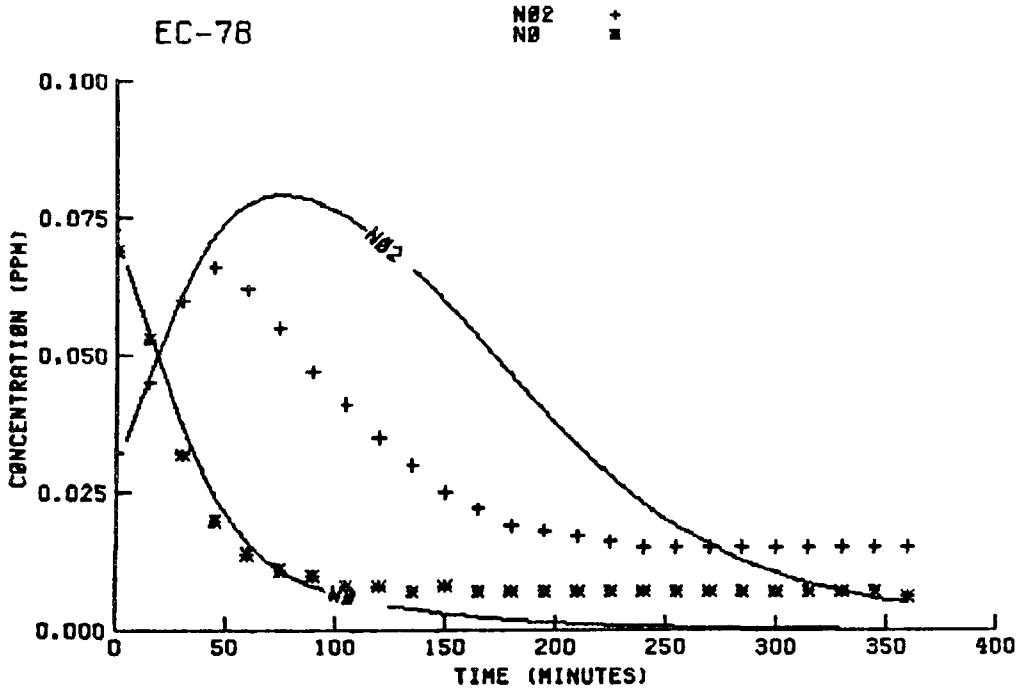

EC-77
Ø3
0.020
0.015
0.010
0.005
0.000
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
Ø3

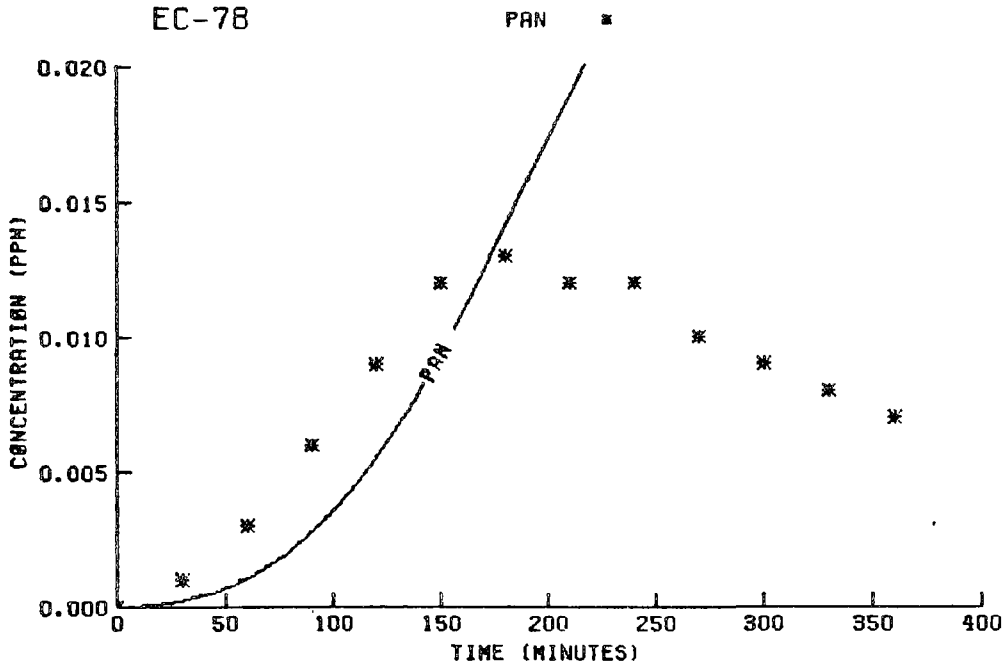

EC-77
NØ2
NØ
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
NØ
NØ2

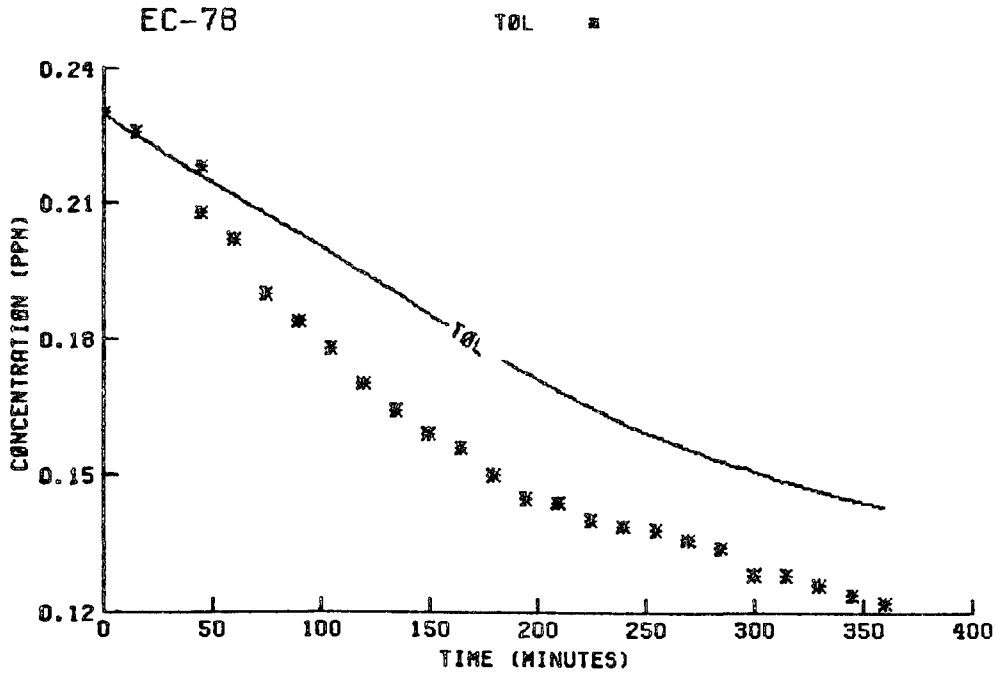

EC-77
PAN *
0.004
0.003
0.002
0.001
0.000
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

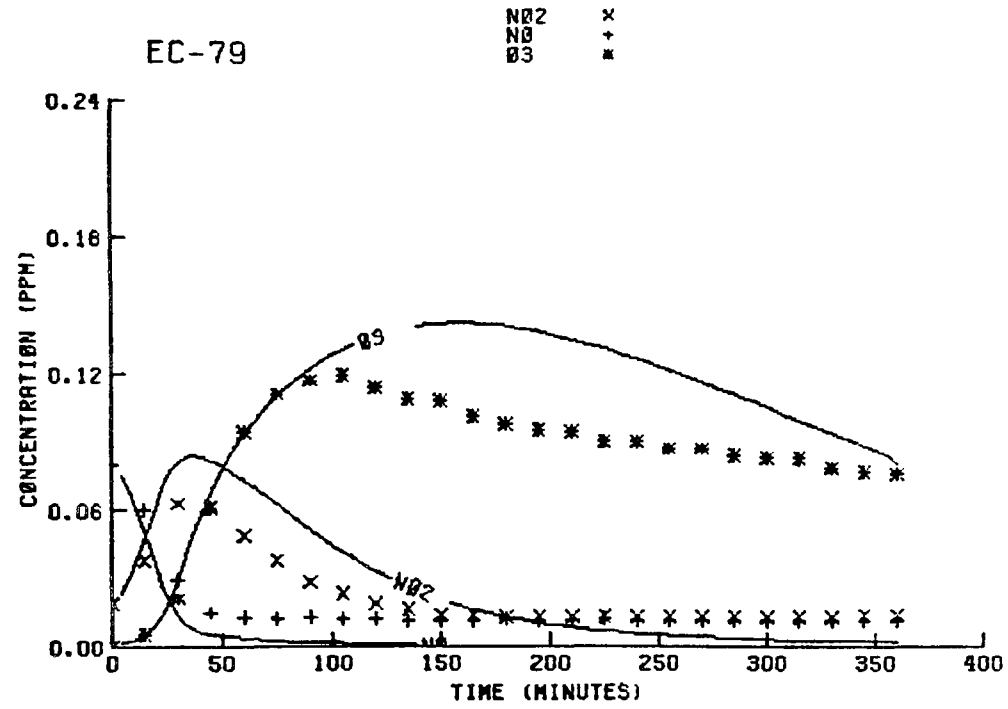

EC-77
TOL *
0.28
0.25
0.22
0.19
0.16
CONCENTRATION (PPM)
TOL
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

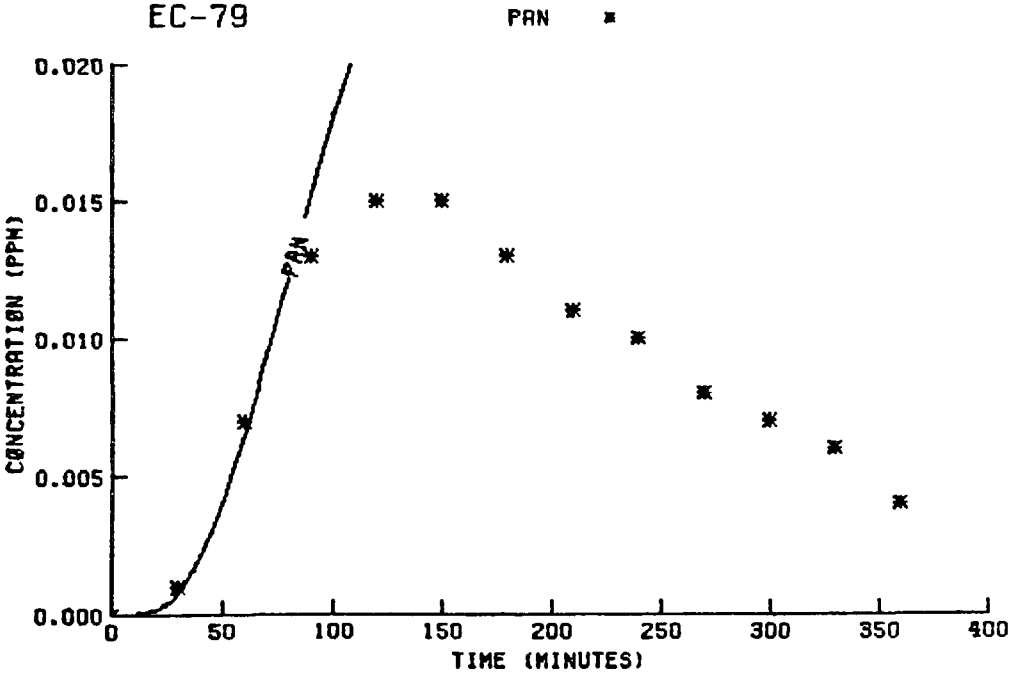

EC-78
Ø3
0.24
0.18
0.12
0.06
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

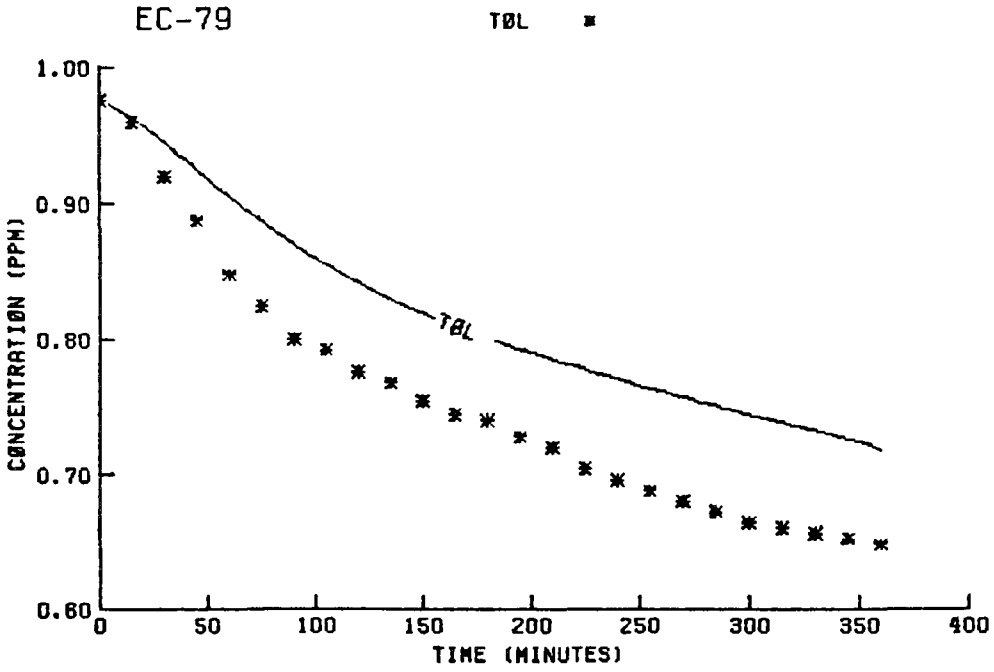

EC-78
NØ2
NØ
0.100
0.075
0.050
0.025
0.000
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

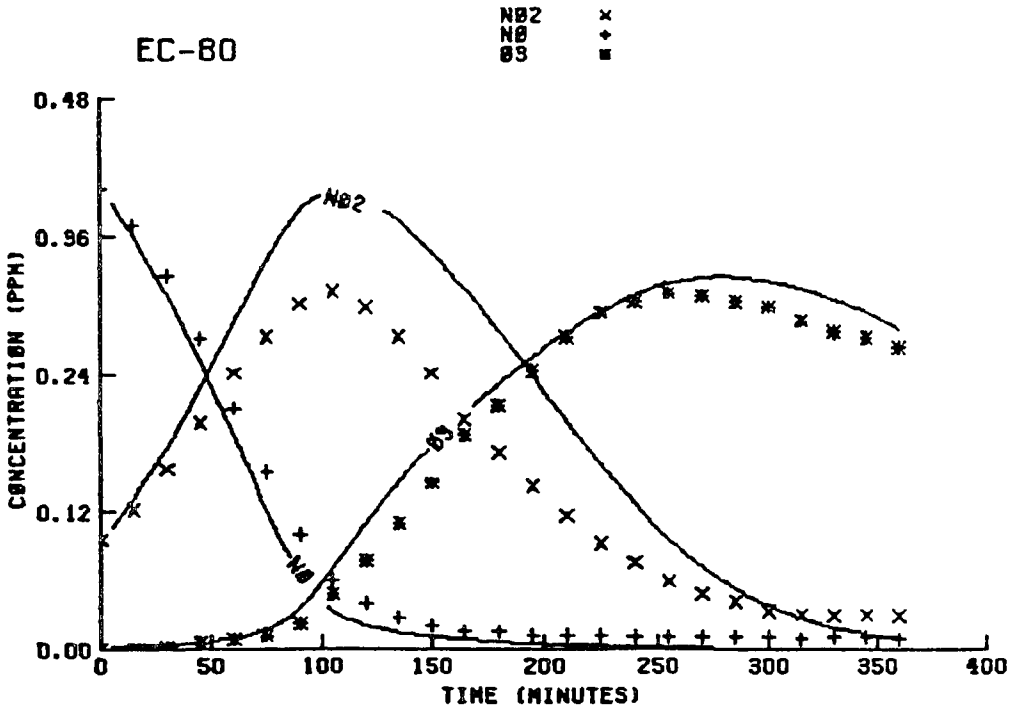

EC-78
PAN
0.020
0.015
0.010
0.005
0.000
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

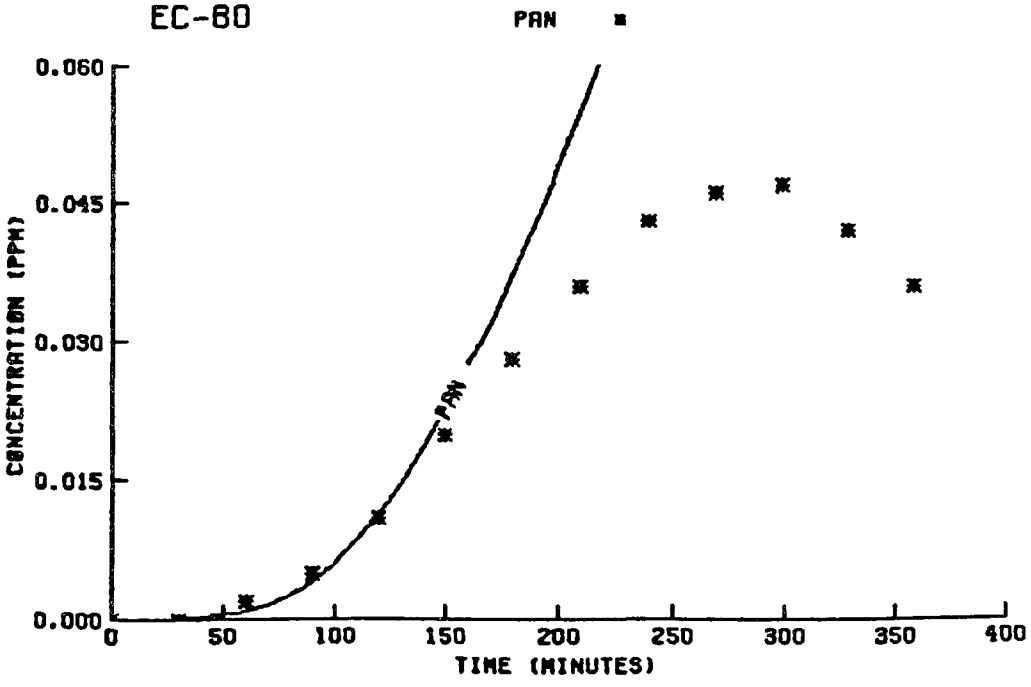

EC-78
TOL
0.24
0.21
0.18
0.15
0.12
CONCENTRATION (PPM)
TOL
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

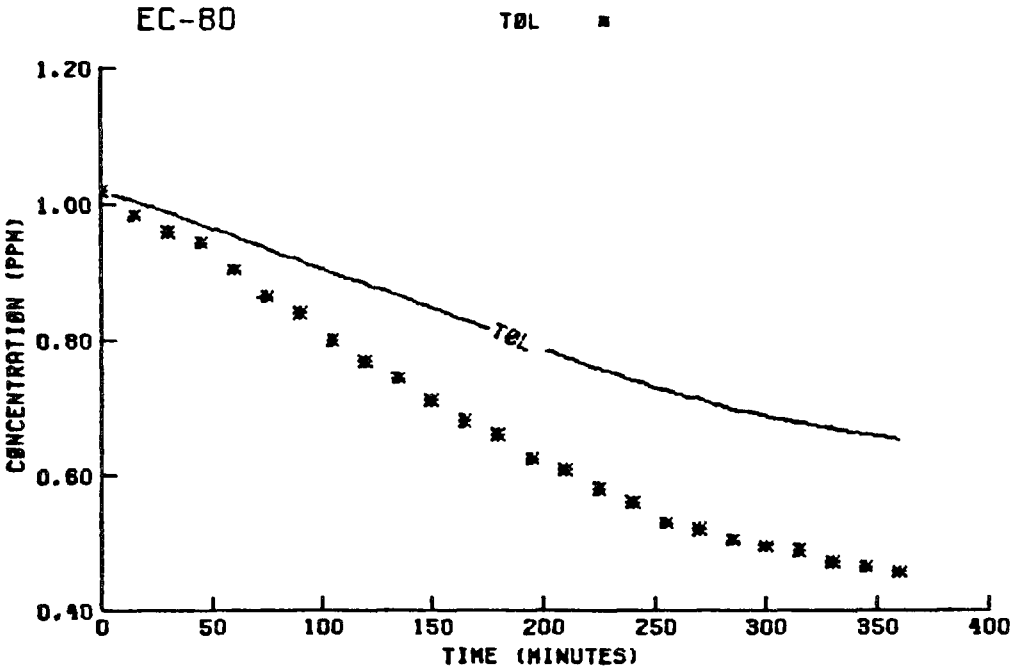

EC-79
NØ2
NØ
Ø3
0.24
0.18
0.12
0.06
0.00
CØNCENTRATIØN (PPM)
Ø3
NØ2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

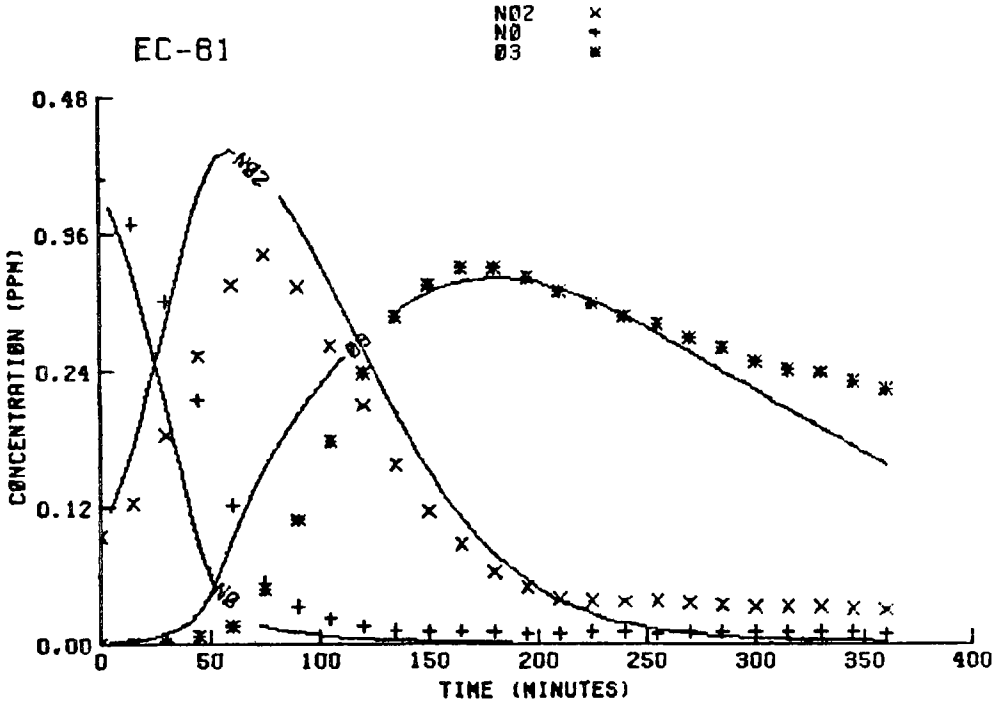

EC-79
PAN
0.020
0.015
0.010
0.005
0.000
CØNCENTRATIØN (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

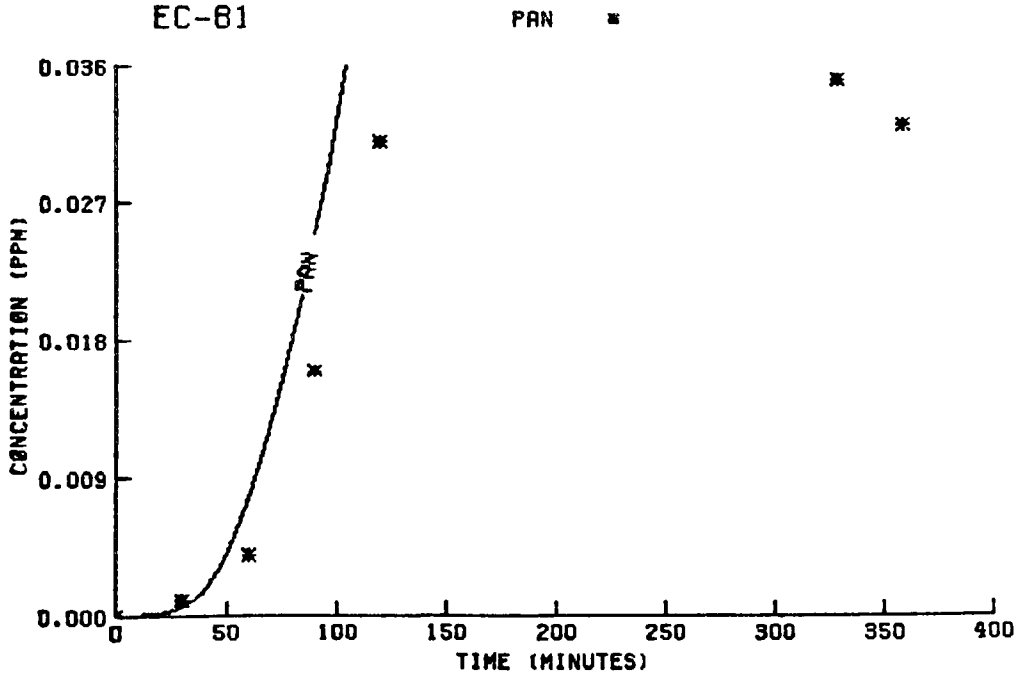

EC-79
TØL
1.00
0.90
0.80
0.70
0.60
CØNCENTRATIØN (PPM)
TØL
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

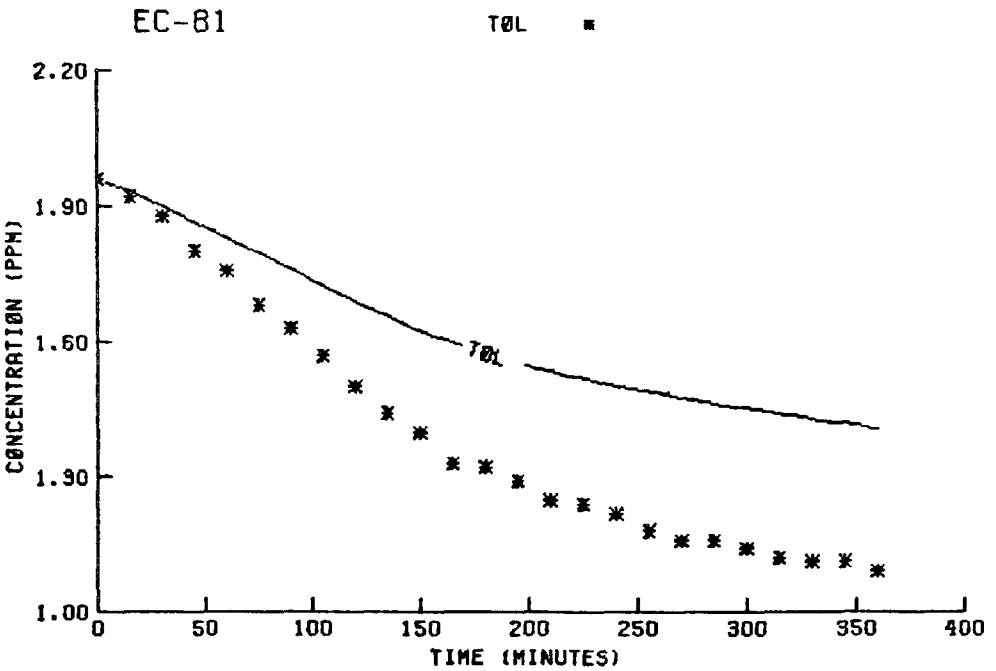

EC-80
NO2
NO
O3
0.48
0.96
0.24
0.12
0.00
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

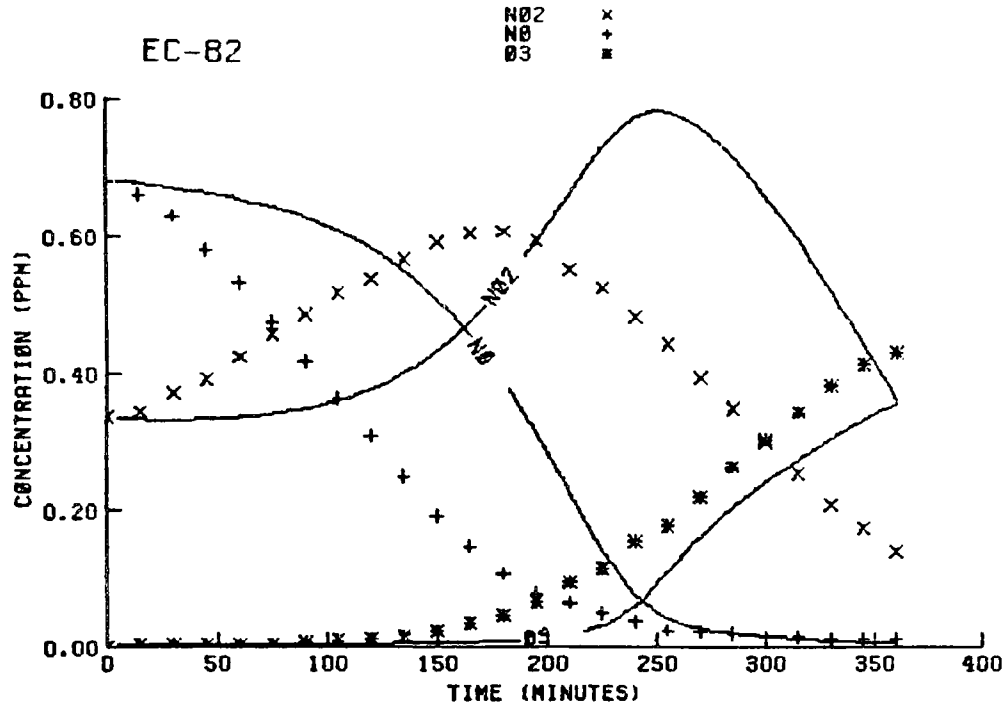

EC-80
PAN
0.060
0.045
0.030
0.015
0.000
CONCENTRATION (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

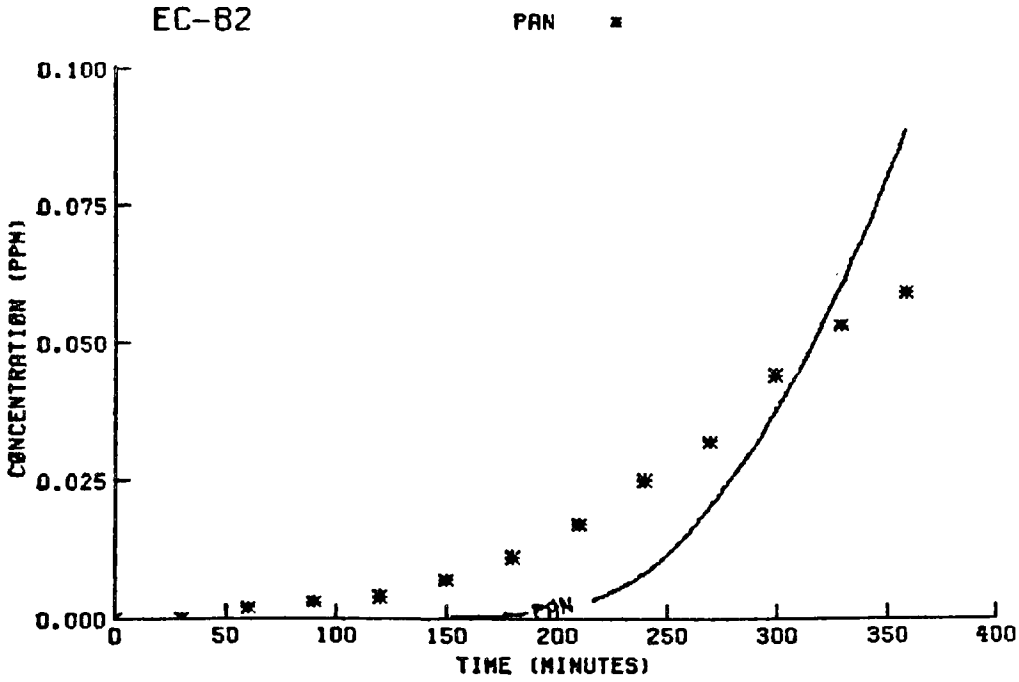

EC-80
TØL
1.20
1.00
0.80
0.60
0.40
CØNCENTRATIØN (PPM)
TØL
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

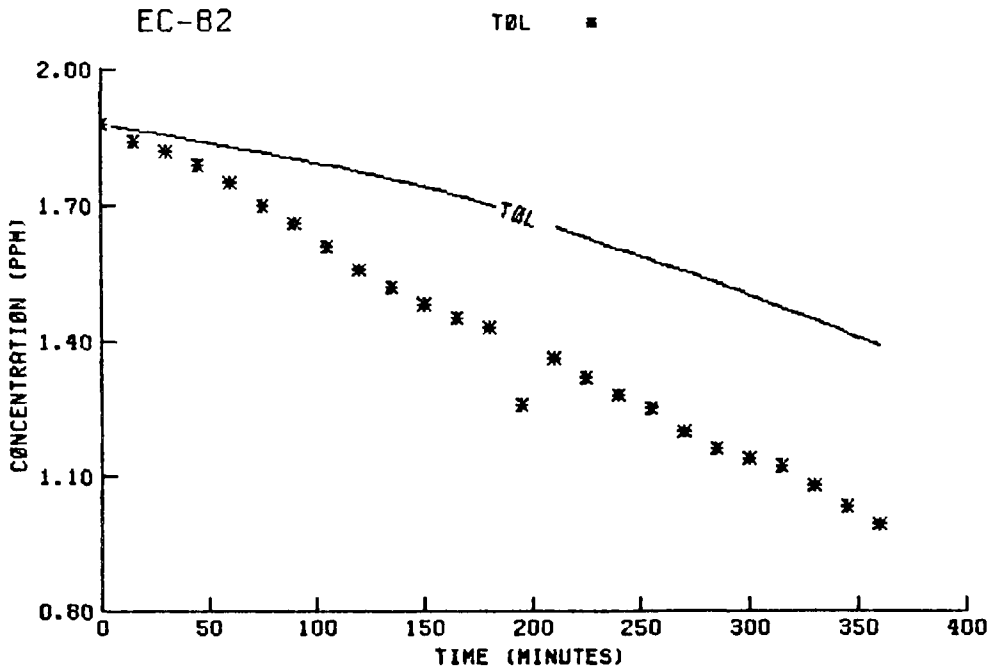

EC-81
NØ2
NØ
Ø3
0.48
0.96
0.24
0.12
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

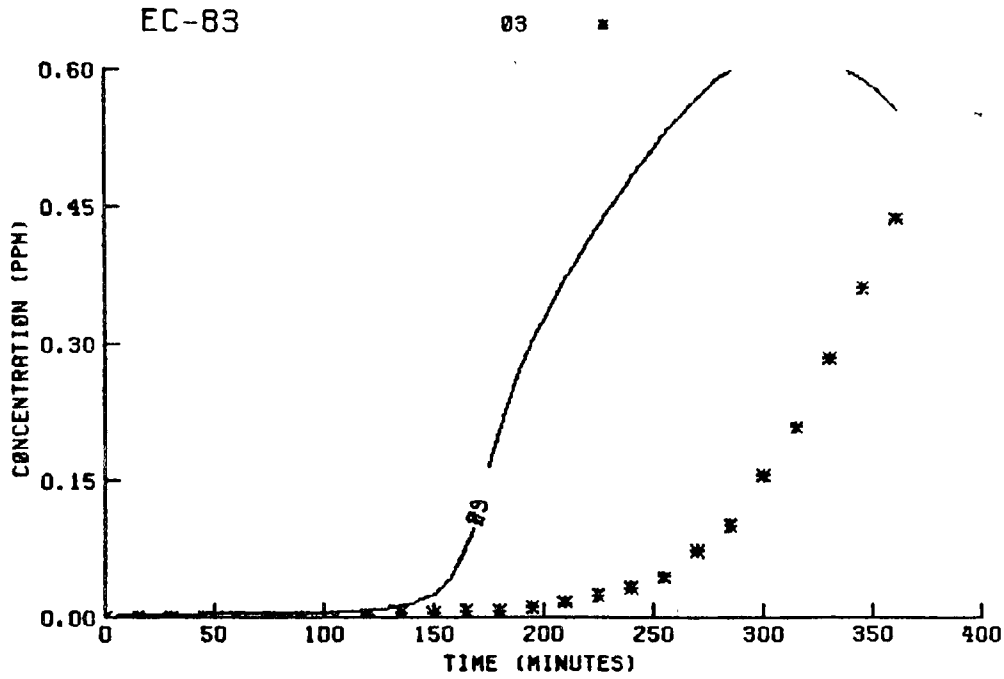

EC-81
PAN
0.036
0.027
0.018
0.009
0.000
CØNCENTRATIØN (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

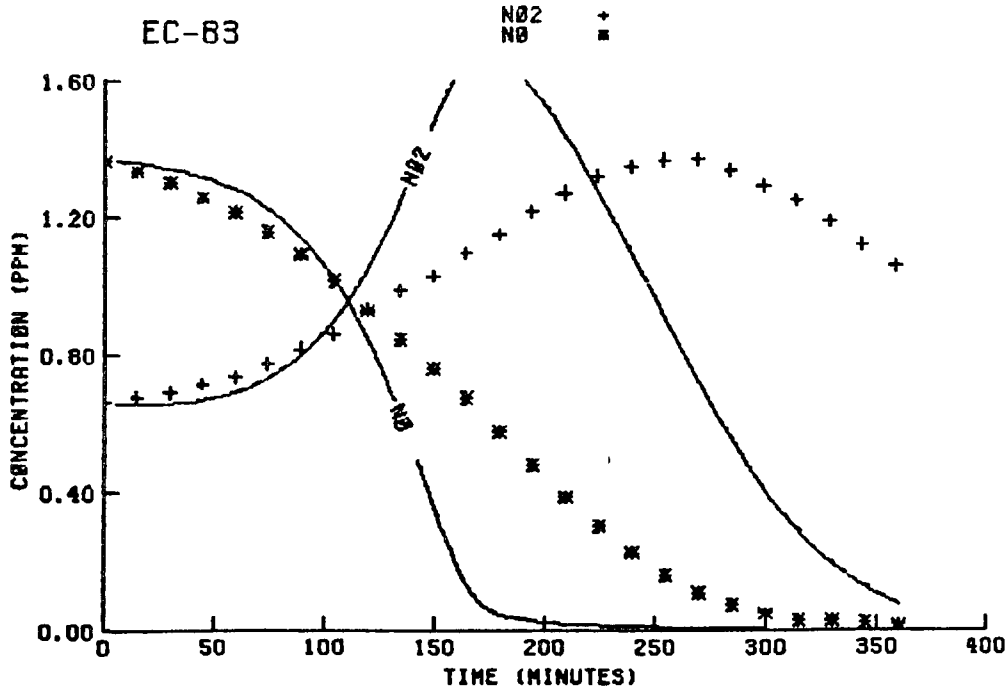

EC-81
TØL
2.20
1.90
1.60
1.30
1.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

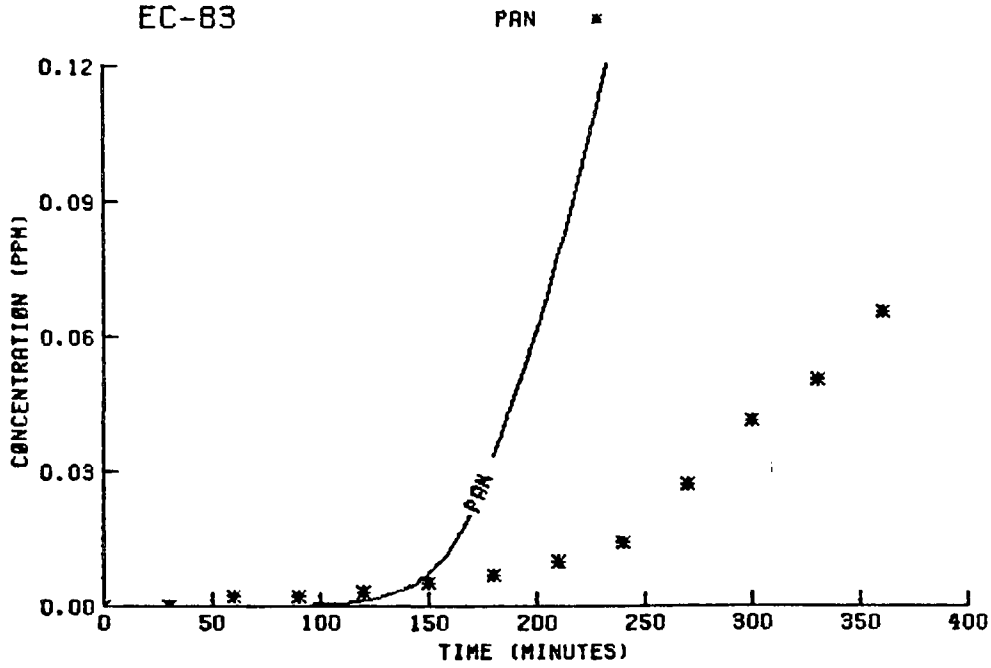

EC-82
NØ2 ×
NØ +
Ø3 ∗
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

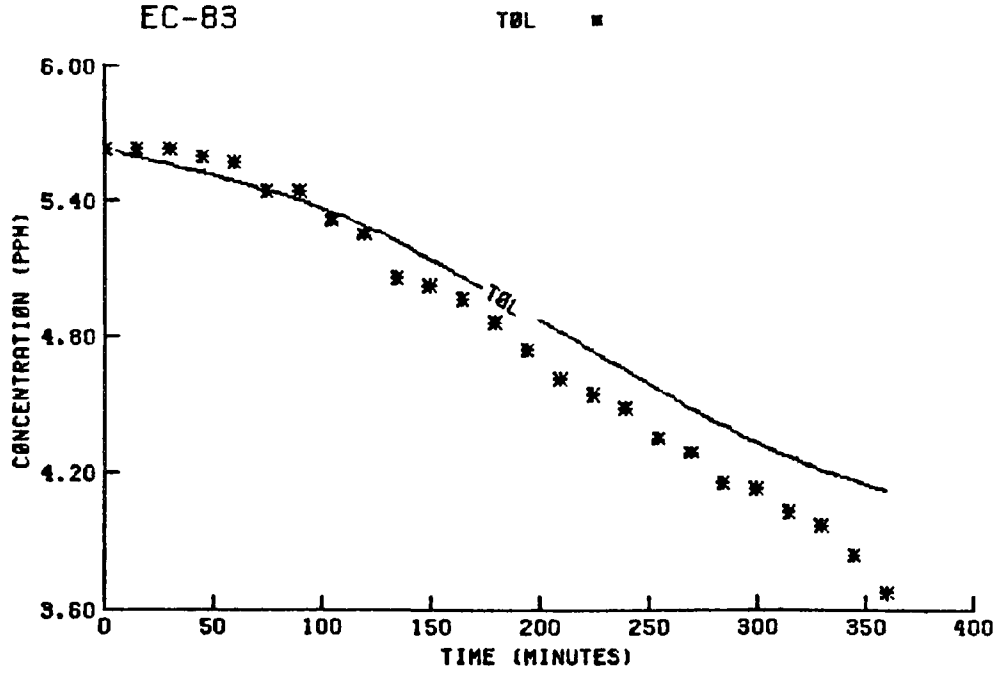

EC-82
PAN ∗
0.100
0.075
0.050
0.025
0.000
CØNCENTRATIØN (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

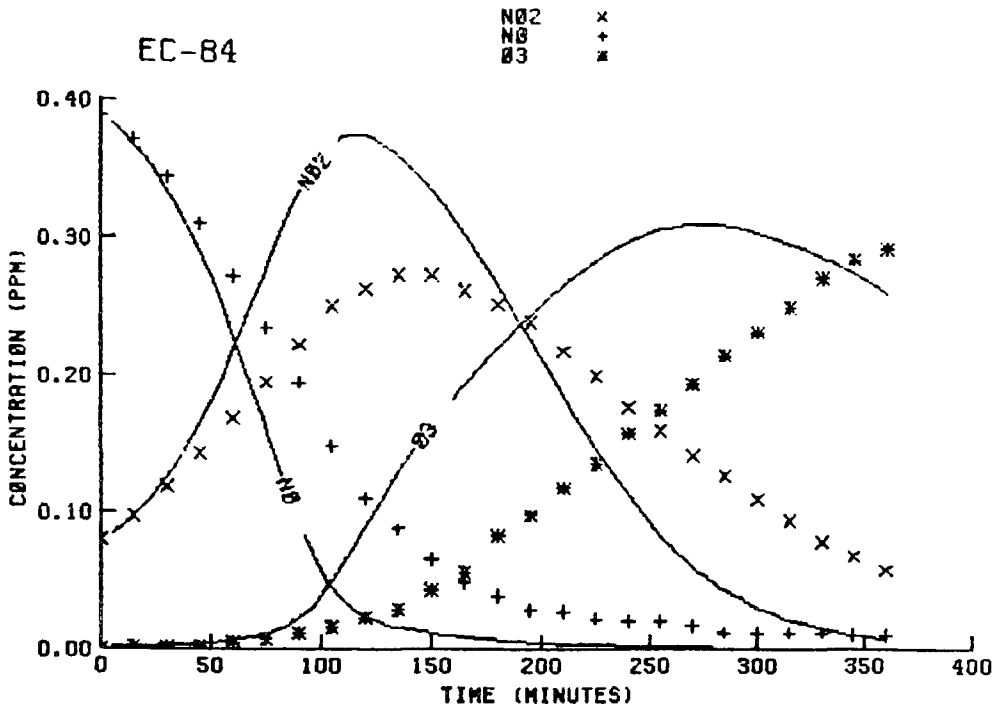

EC-82
TØL
2.00
1.70
1.40
1.10
0.80
CØNCENTRATIØN (PPM)
TØL
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

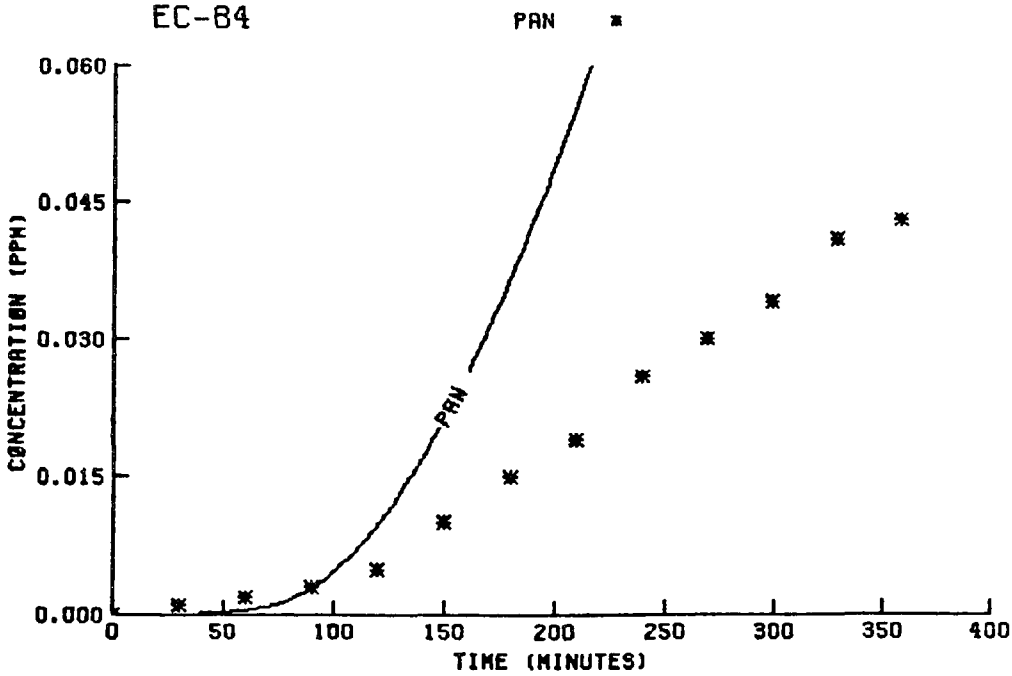

EC-83
Ø3
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

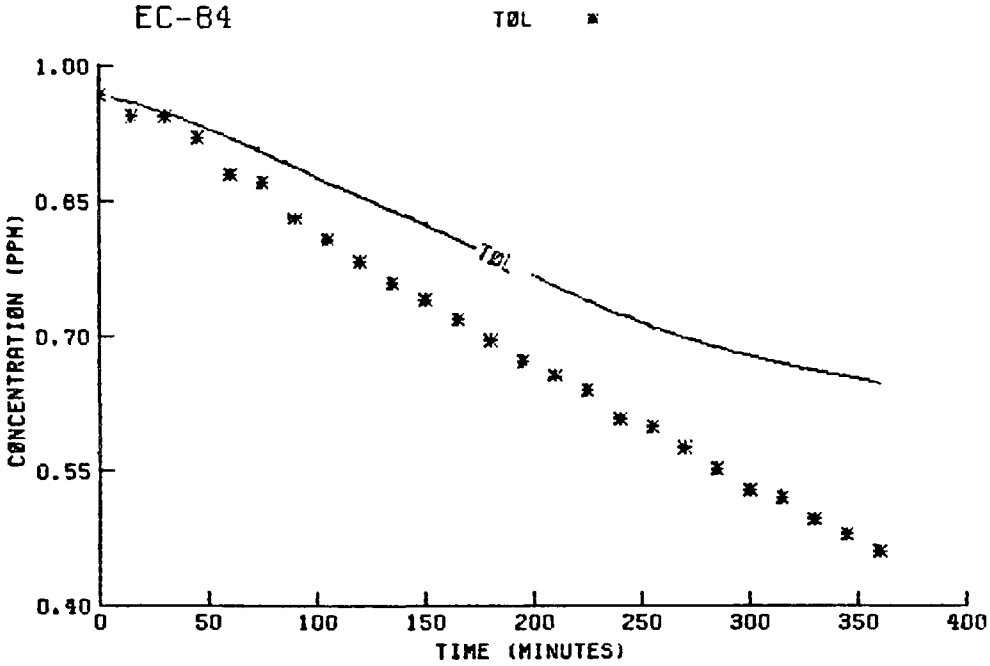

EC-83
NØ2
NØ
1.60
1.20
0.80
0.40
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

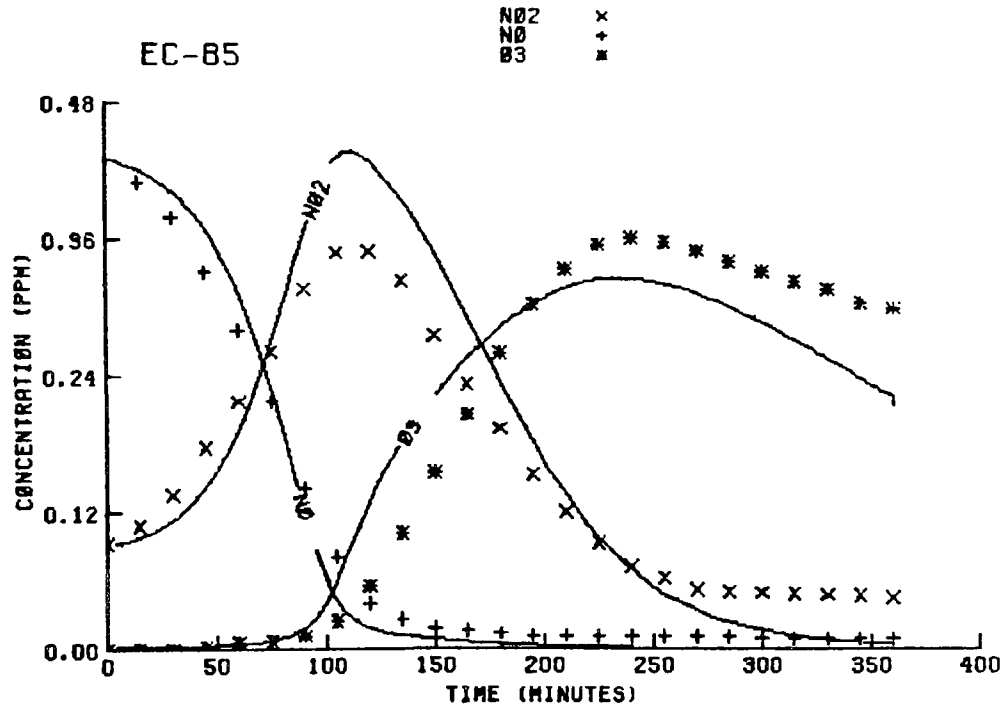

EC-83
PAN
0.12
0.09
0.06
0.03
0.00
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

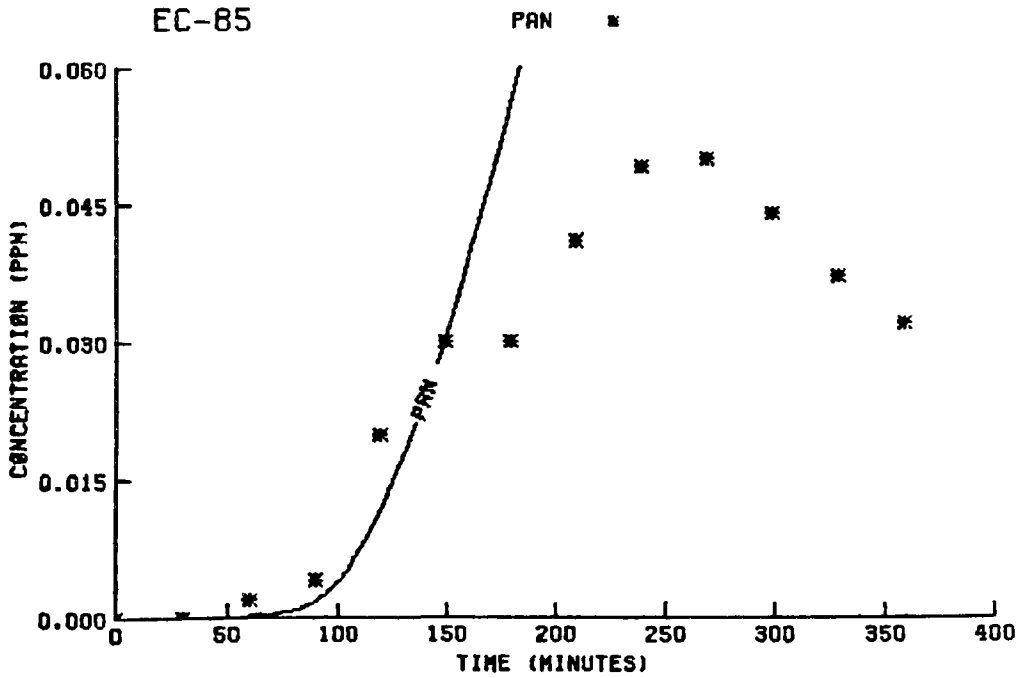

EC-83
TOL
6.00
5.40
4.80
4.20
3.60
CONCENTRATION (PPM)
TOL
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

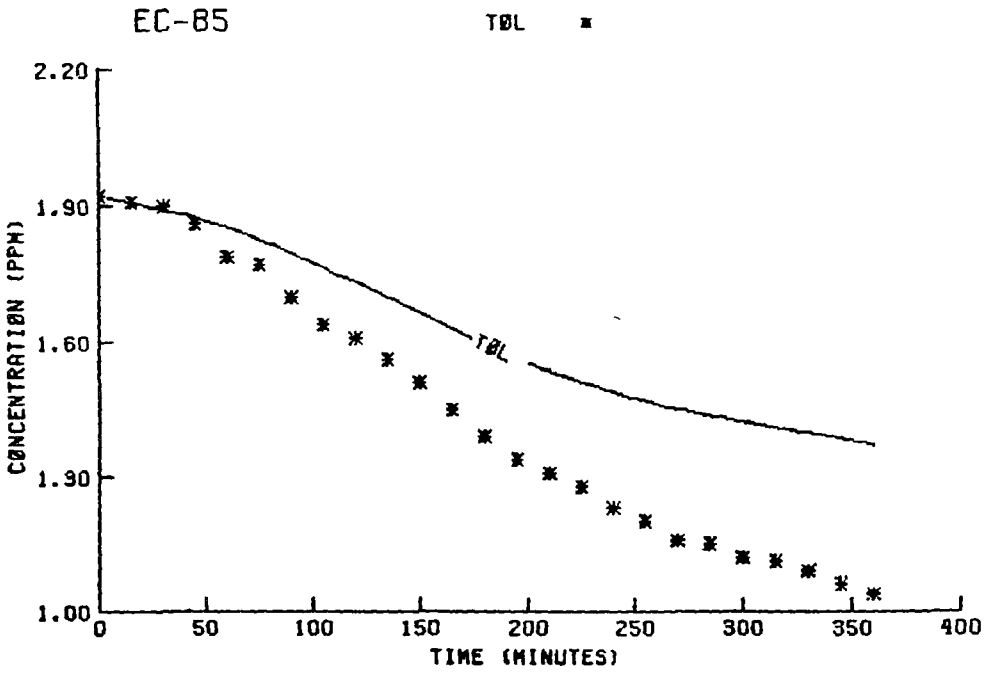

EC-84
NØ2
NØ
Ø3
0.40
0.30
0.20
0.10
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

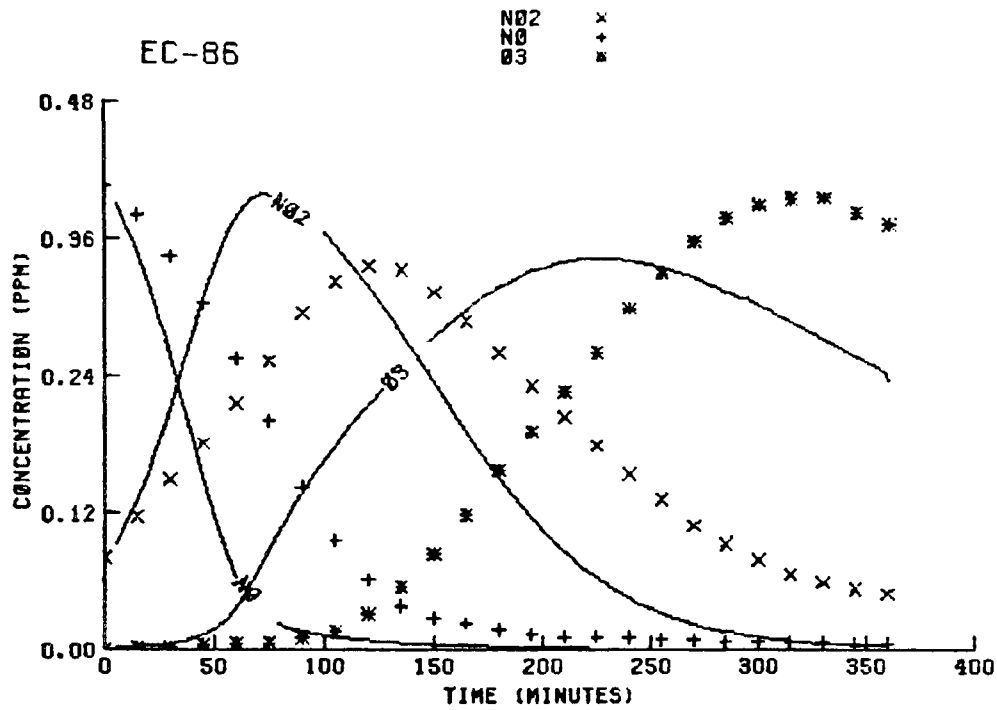

EC-84
PAN
0.060
0.045
0.030
0.015
0.000
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

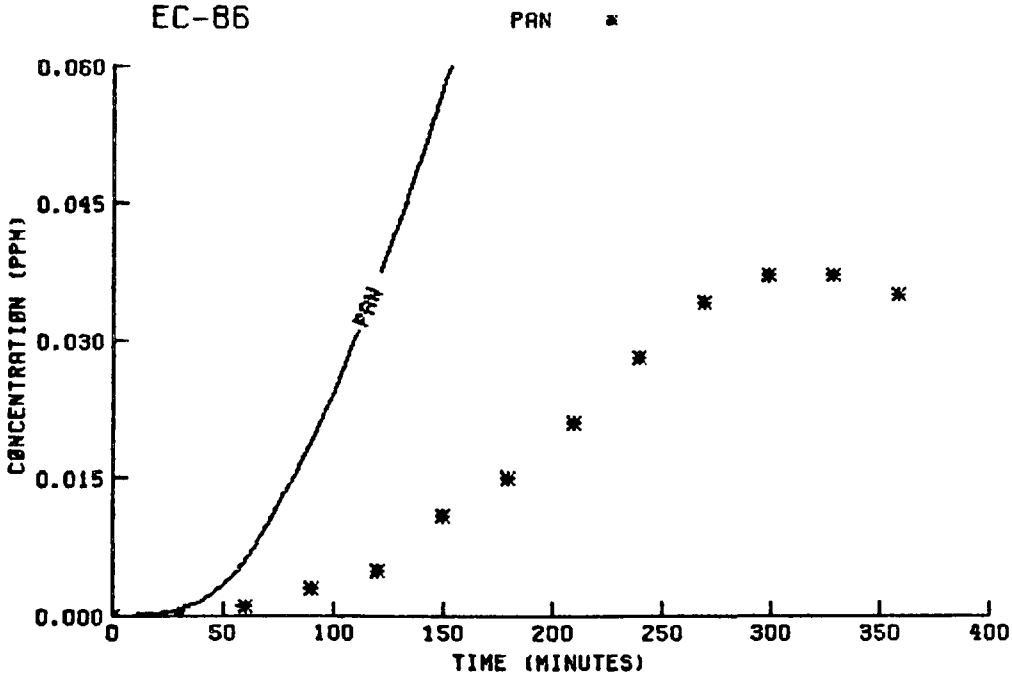

EC-84
TØL
1.00
0.85
0.70
0.55
0.40
CØNCENTRATIØN (PPM)
TØL
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-85
NØ2
NØ
Ø3
0.48
0.96
0.24
0.12
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

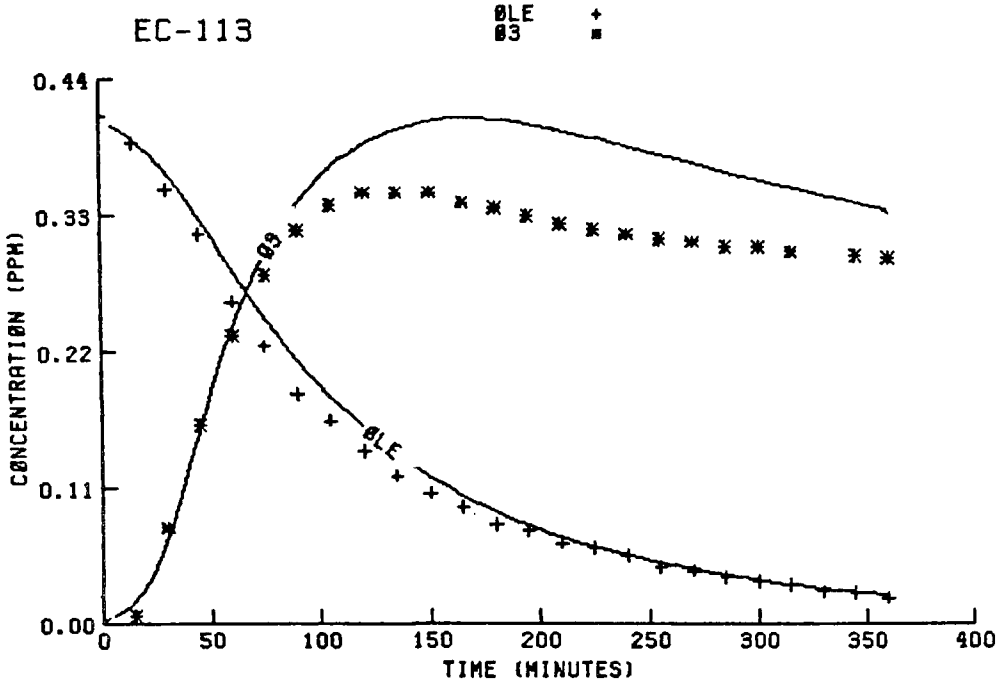

EC-85
PAN
0.060
0.045
0.030
0.015
0.000
CØNCENTRATIØN (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

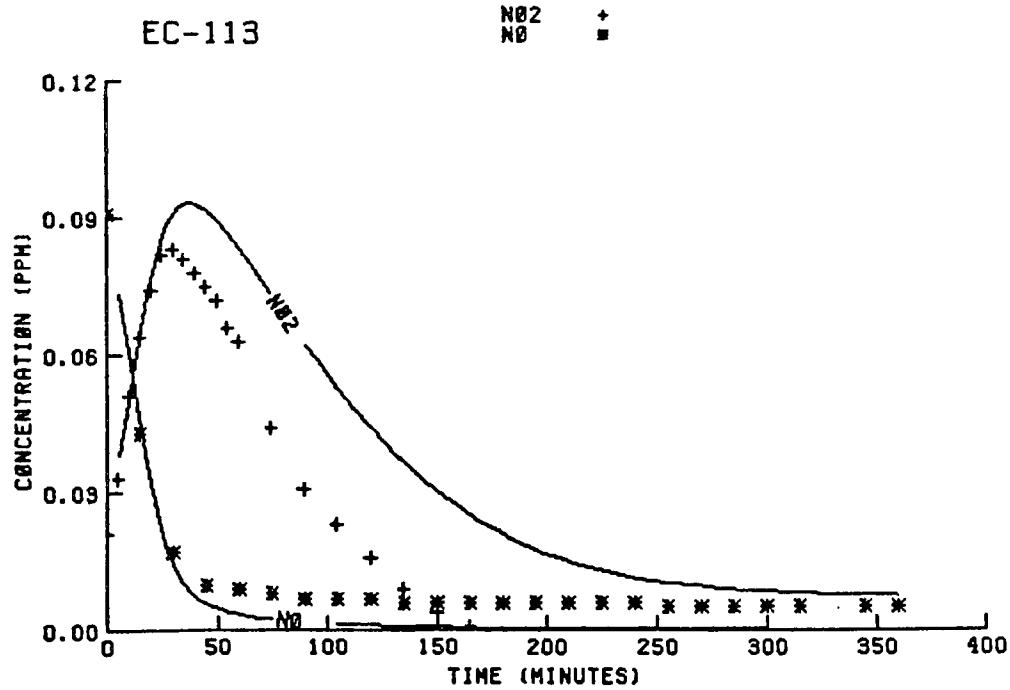

EC-85
TØL
2.20
1.90
1.60
1.90
1.00
CØNCENTRATIØN (PPM)
TØL
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

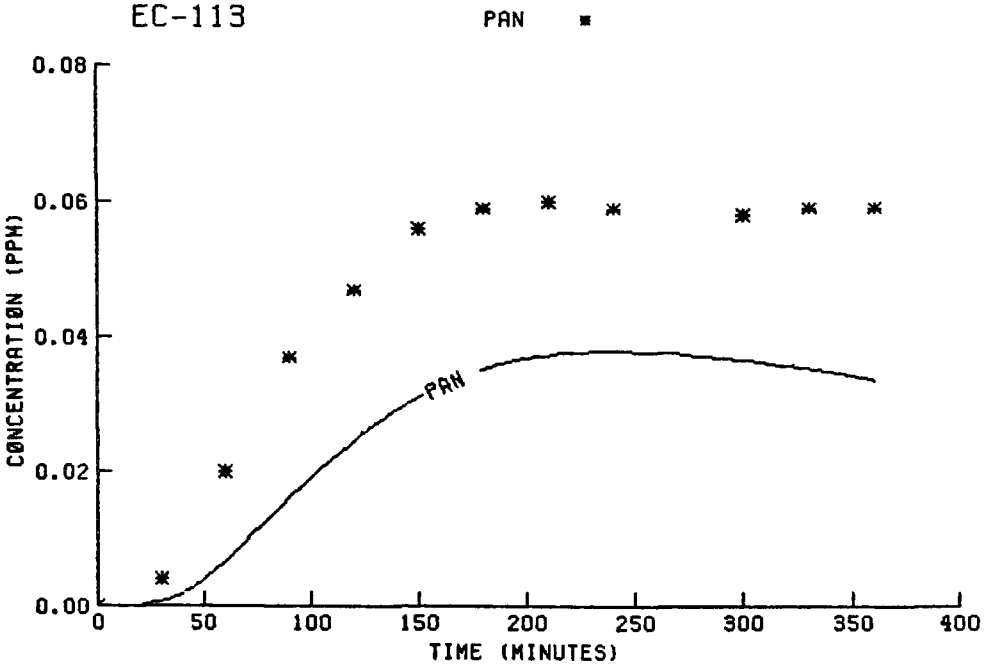

EC-86
NØ2
NØ
Ø3
0.48
0.96
0.24
0.12
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

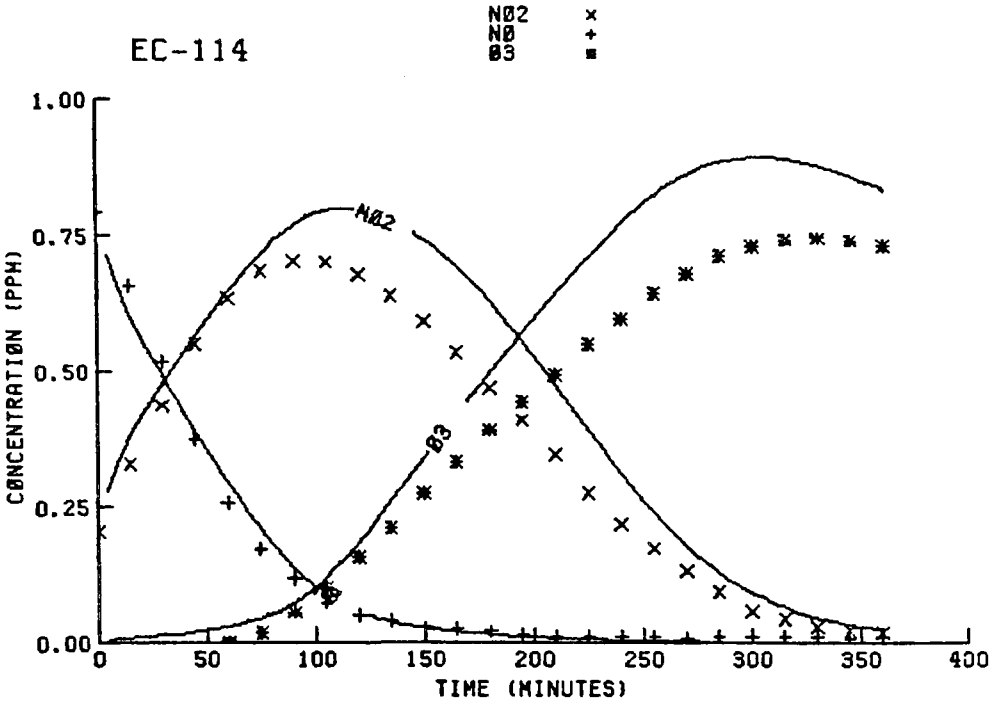

EC-86
PAN
0.060
0.045
0.030
0.015
0.000
CØNCENTRATIØN (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

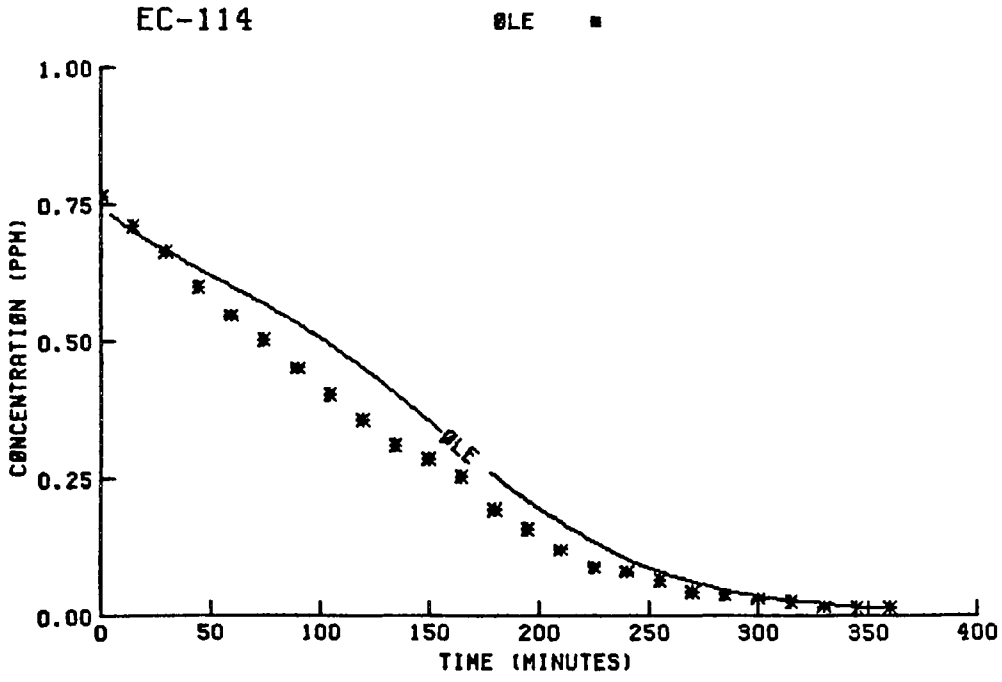
UCR PROPYLENE/BUTANE EXPERIMENTS

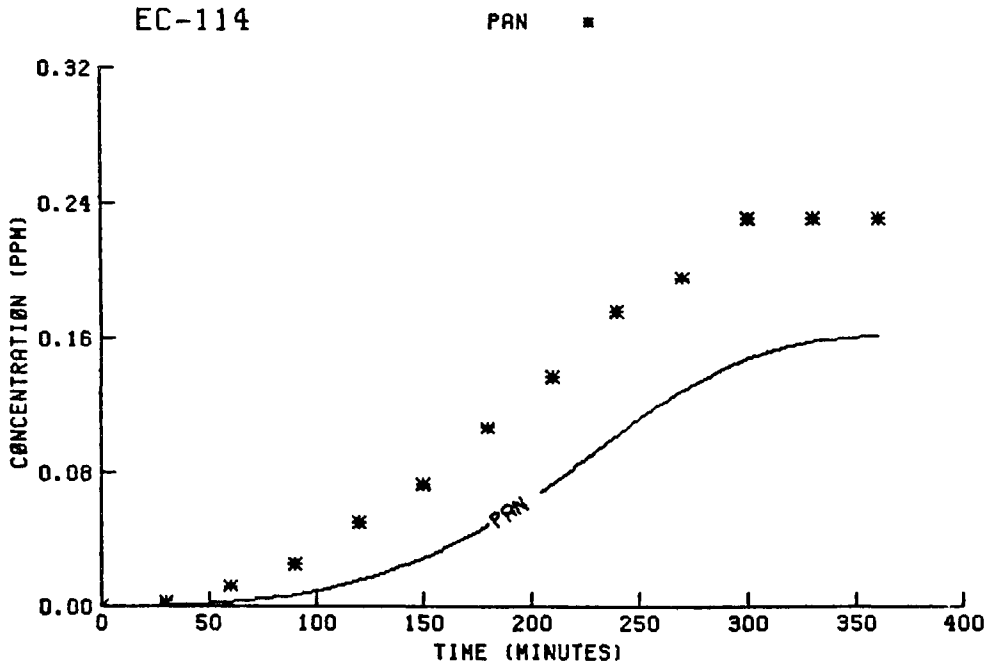

EC-113
ØLE +
Ø3 ■
0.44
0.33
0.22
0.11
0.00
CØNCENTRATIØN (PPM)
Ø3
ØLE
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-113
NØ2 +
NØ ■
0.12
0.09
0.06
0.03
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

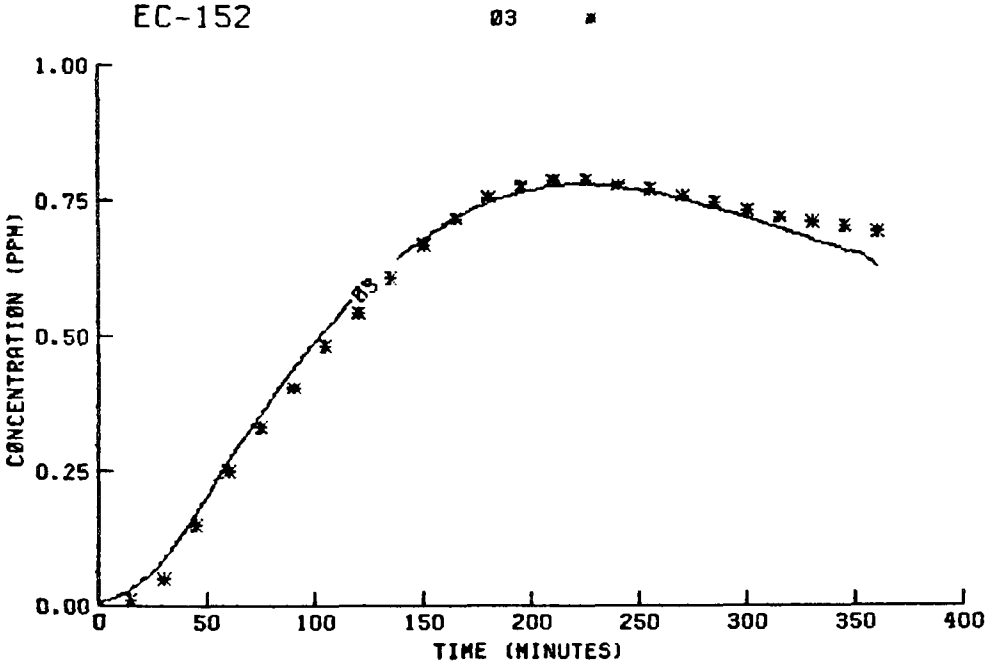

EC-113
PAN
0.08
0.06
0.04
0.02
0.00
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

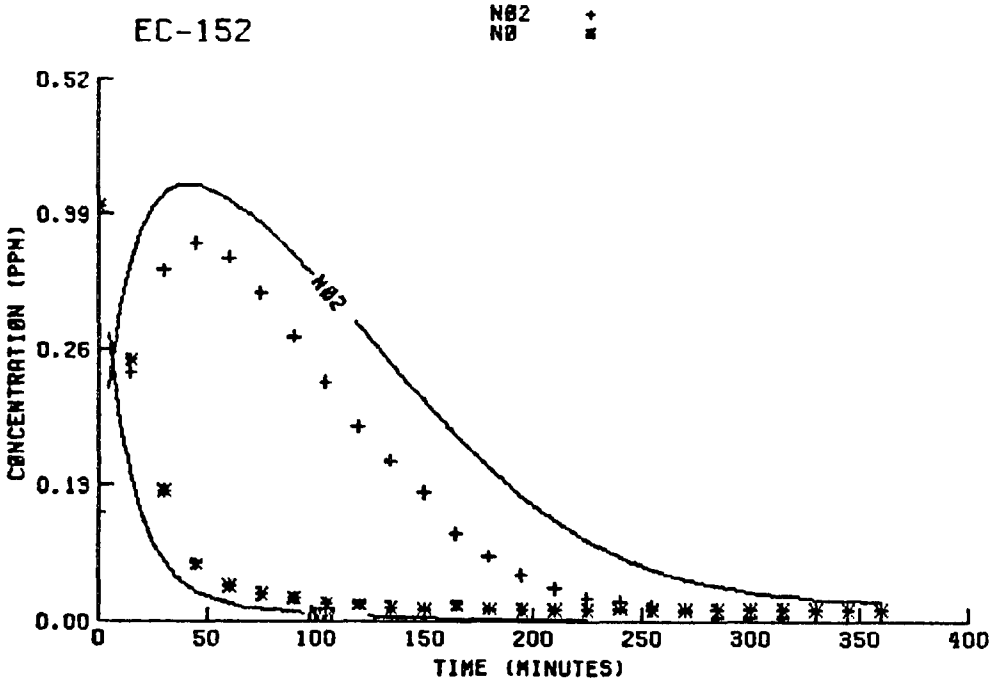

EC-114
NØ2 ×
NØ +
Ø3 ■
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
NØ2
Ø3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

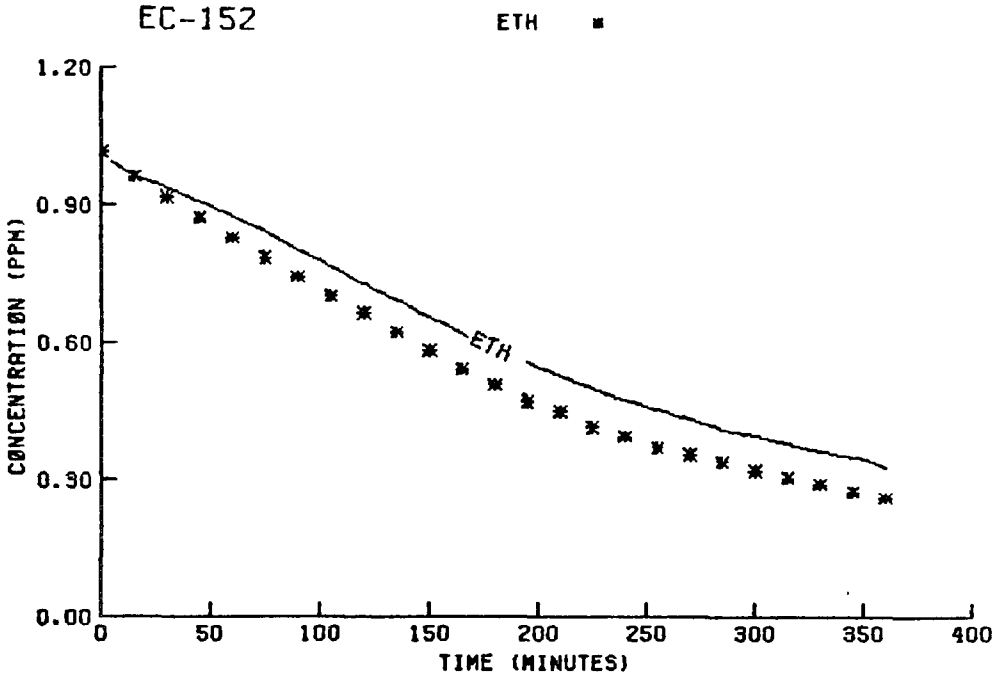

EC-114
ØLE ■
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
ØLE
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

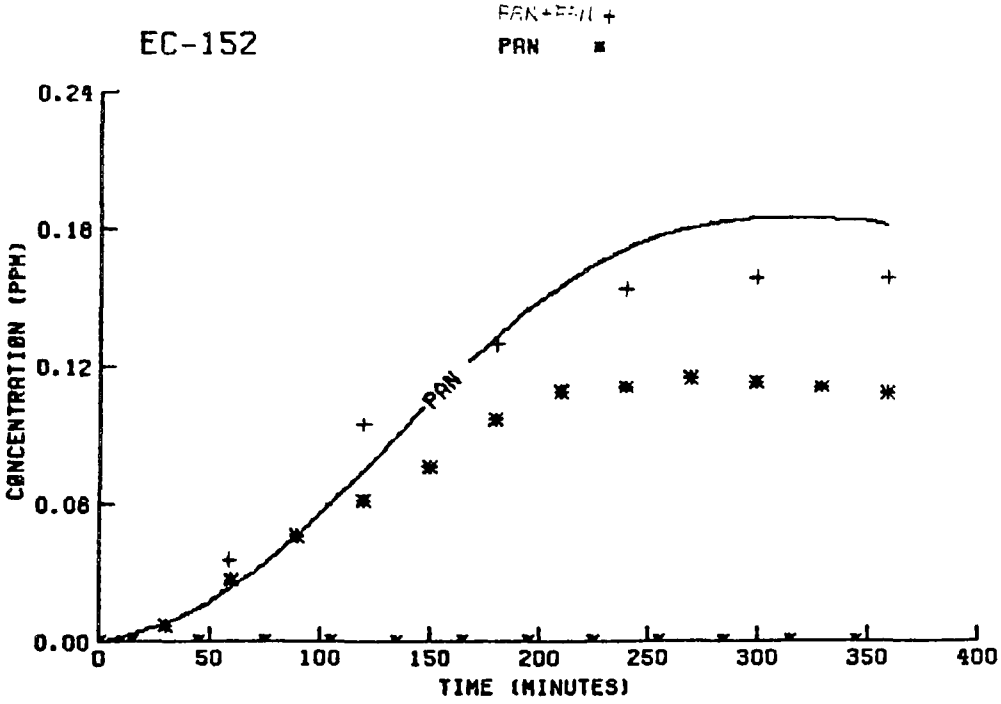

EC-114
PAN
0.32
0.24
0.16
0.08
0.00
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

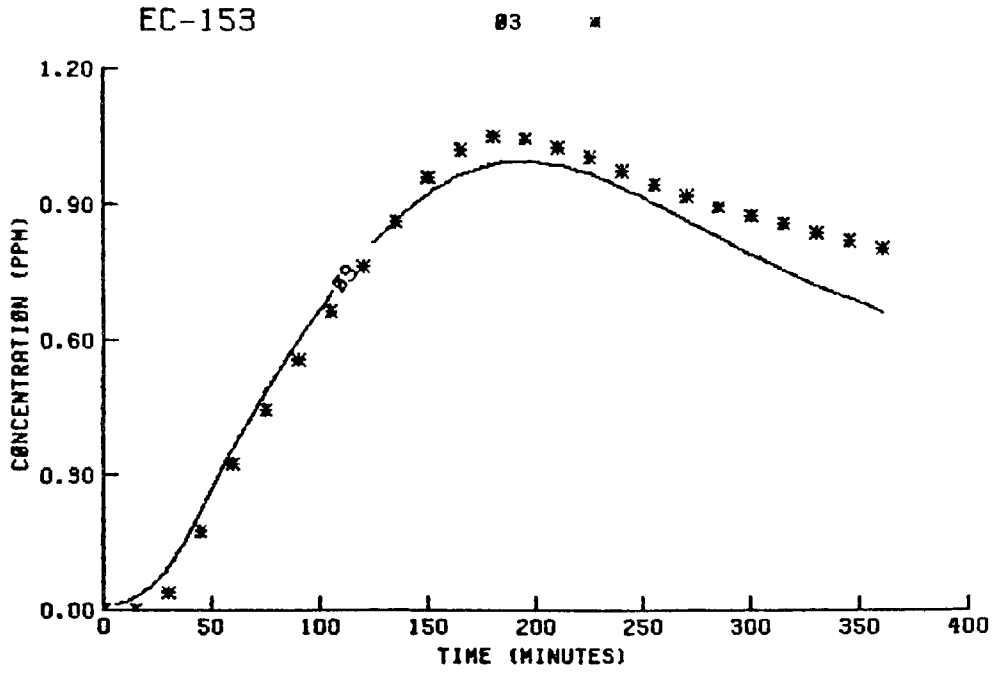
UCR MULTIOLEFIN EXPERIMENTS

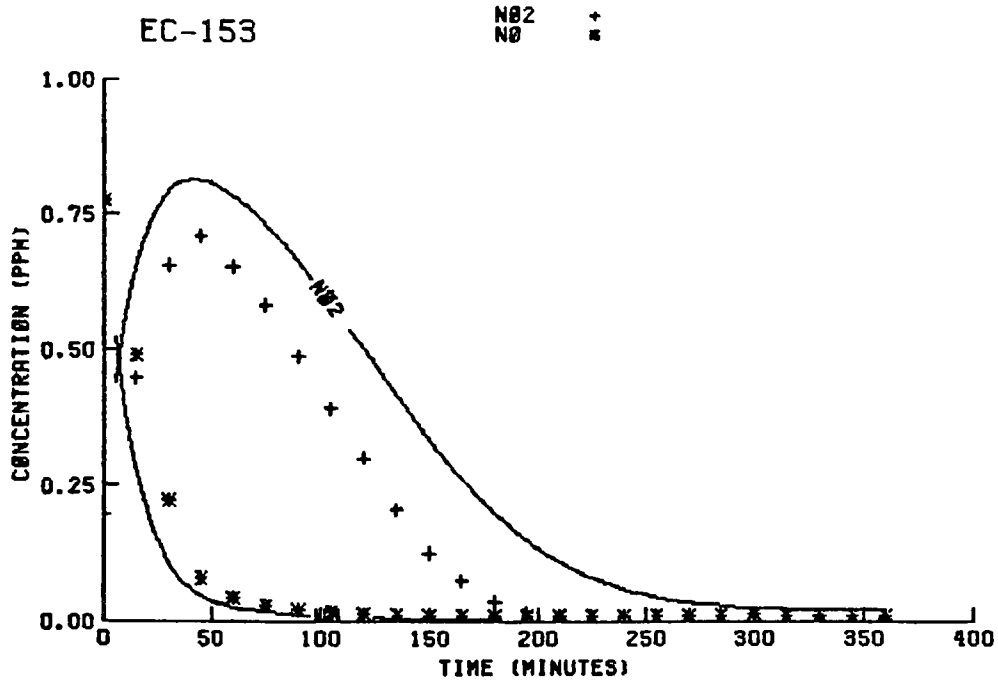

EC-152
03
1.00
0.75
0.50
0.25
0.00
CONCENTRATION (PPM)
03
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

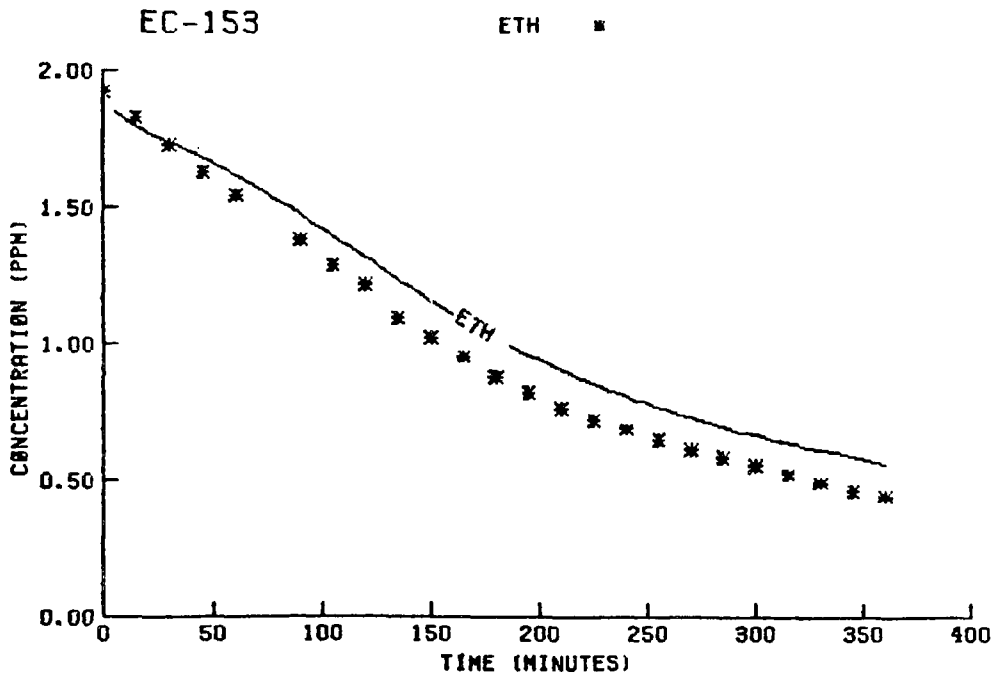

EC-152
NO2
NO
0.52
0.39
0.26
0.13
0.00
CONCENTRATION (PPM)
NO2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

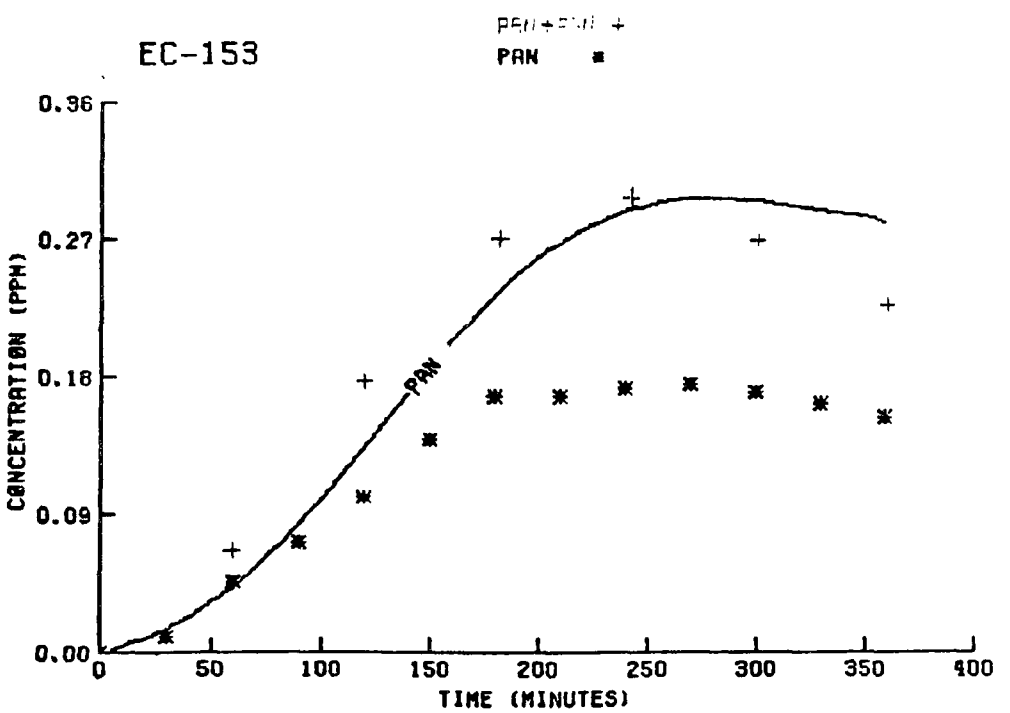

EC-152
ETH
1.20
0.90
0.60
0.30
0.00
CONCENTRATION (PPM)
ETH
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-152
PAN
0.24
0.18
0.12
0.06
0.00
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

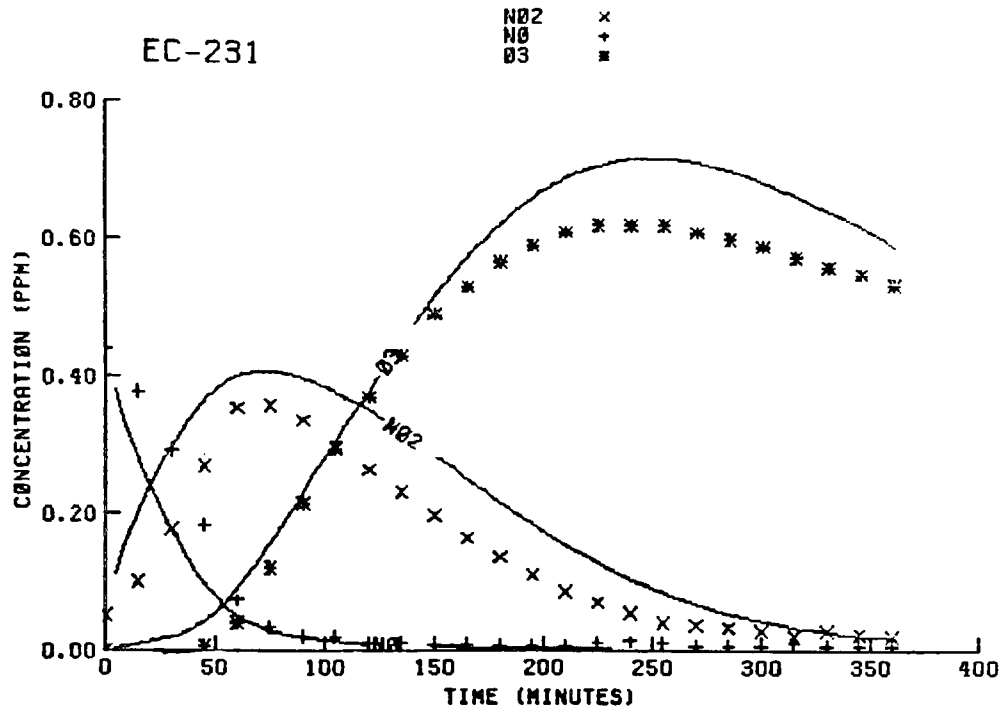

EC-153
Ø3
1.20
0.90
0.60
0.30
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

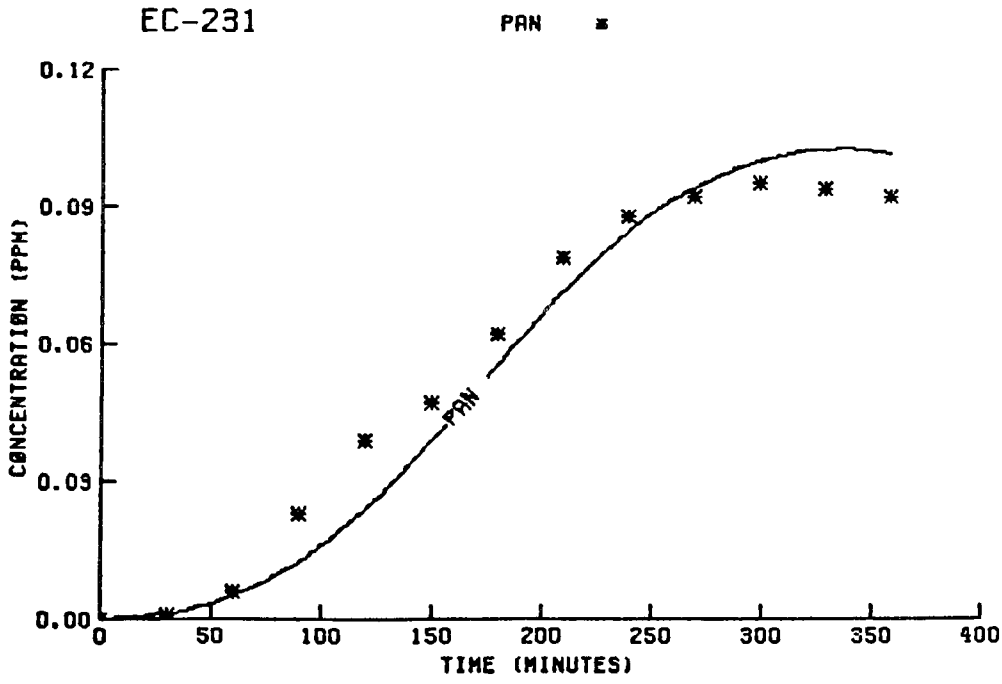

EC-153
NØ2
NØ
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

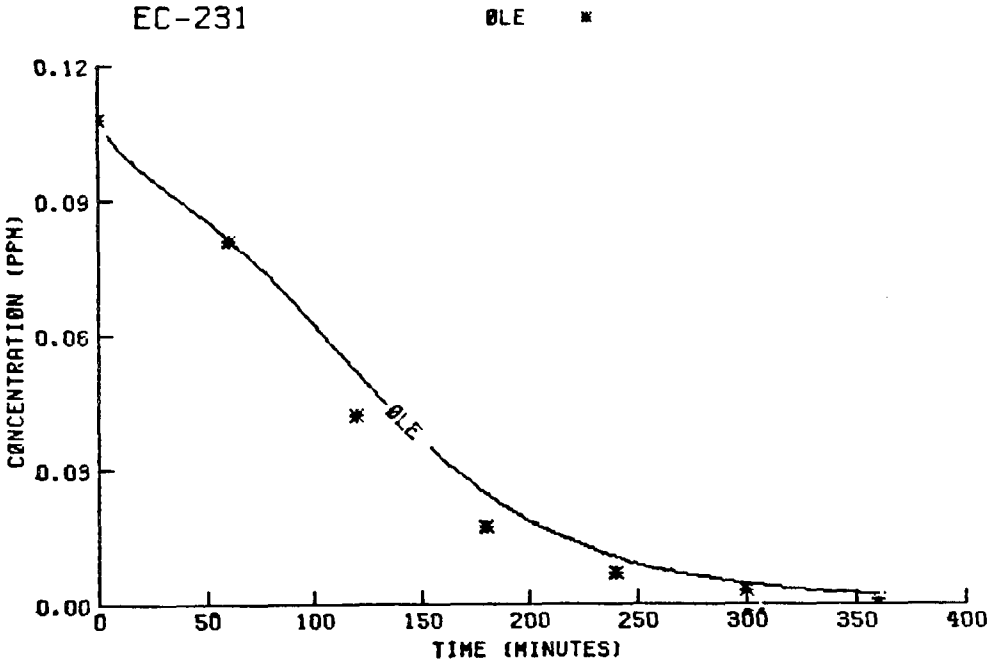

EC-153
ETH
2.00
1.50
1.00
0.50
0.00
CONCENTRATION (PPM)
ETH
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-153
PAN
0.36
0.27
0.18
0.09
0.00
CONCENTRATION (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

UCR SEVEN-HYDROCARBON EXPERIMENTS


EC-231
NØ2
NØ
Ø3
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
Ø3
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-231
PAN
0.12
0.09
0.06
0.03
0.00
CØNCENTRATIØN (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-231
ØLE
0.12
0.09
0.06
0.03
0.00
CØNCENTRATIØN (PPM)
ØLE
0
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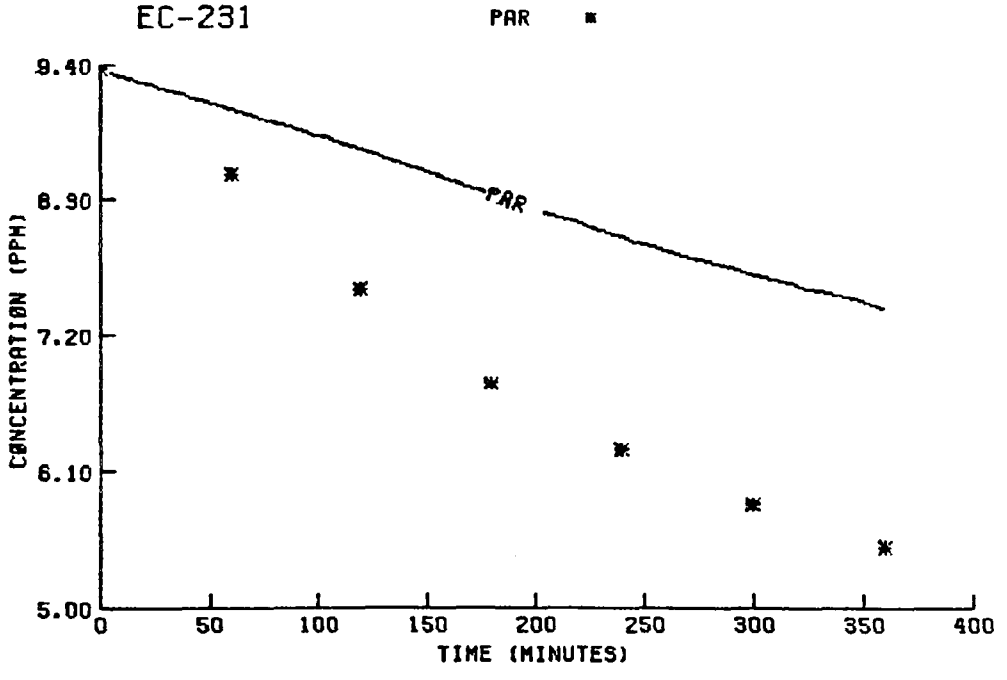
150
200
250
300
350
400
TIME (MINUTES)


EC-231
PAR
9.40
8.90
7.20
6.10
5.00
CØNCENTRATIØN (PPM)
PAR
0
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150
200
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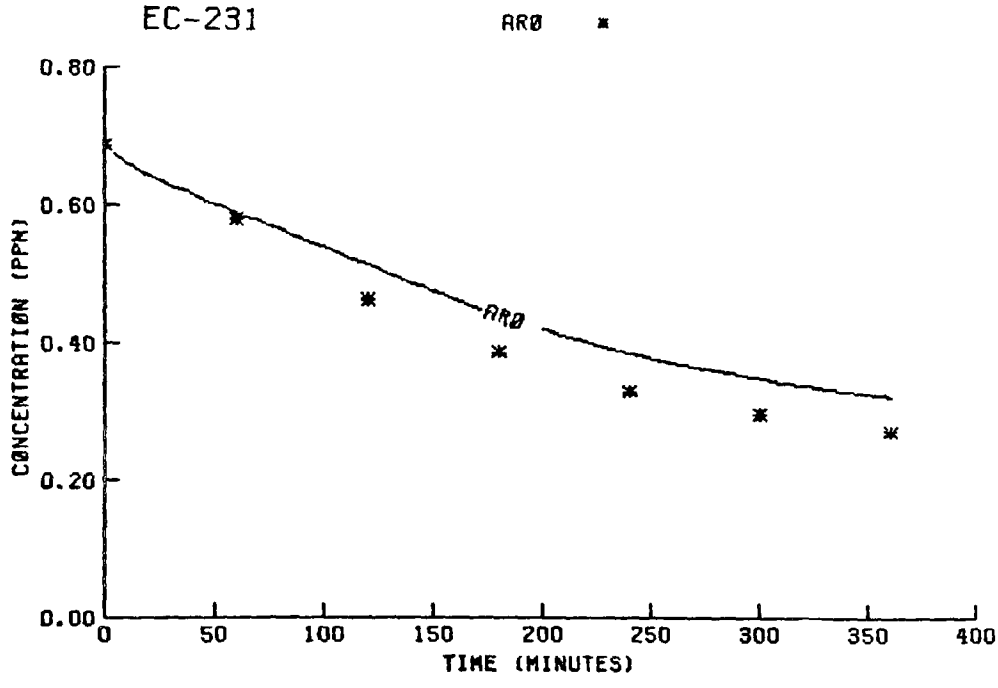
350
400
TIME (MINUTES)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ARØ
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0.40
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ARØ
0
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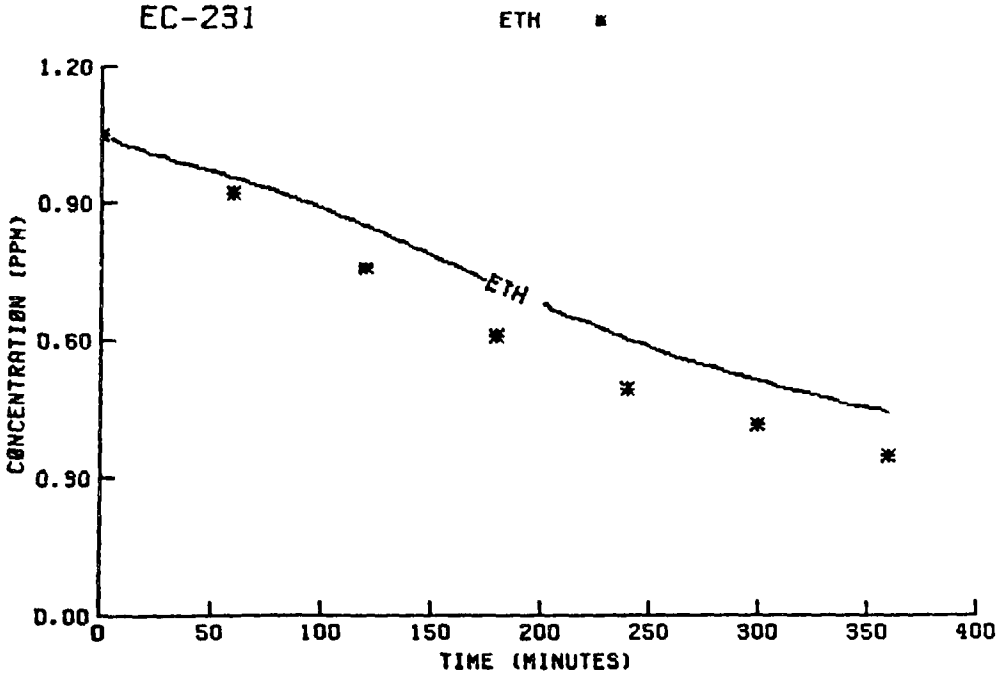
100
150
200
250
300
350
400
TIME (MINUTES)


EC-231
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ETH
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200
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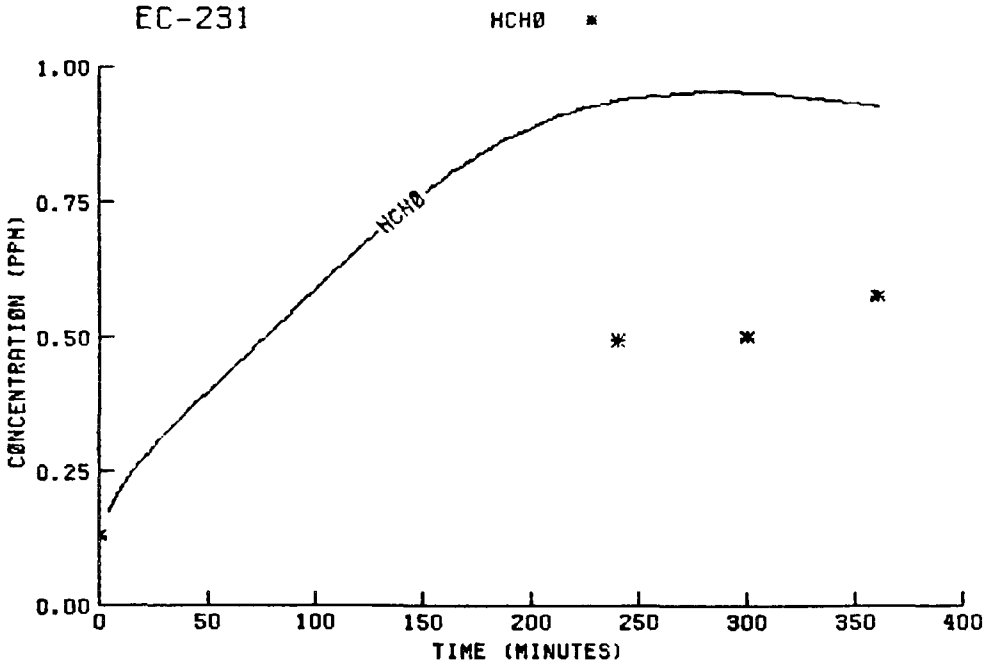
400
TIME (MINUTES)


EC-231
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1.00
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0.50
0.25
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CØNCENTRATIØN (PPM)
HCHØ
0
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150
200
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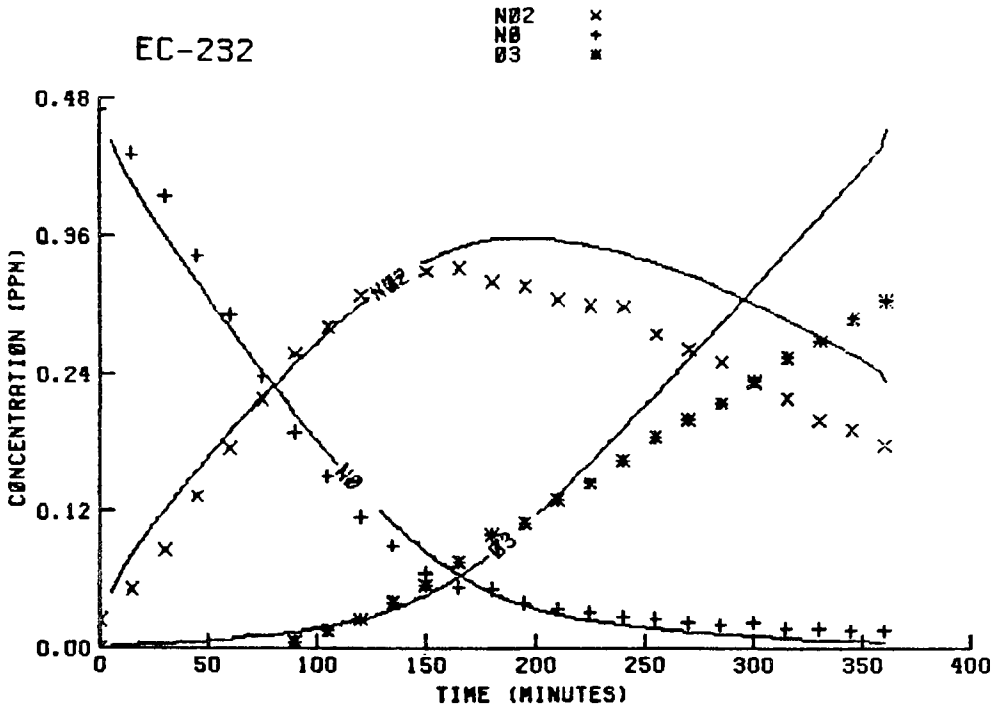
300
350
400
TIME (MINUTES)


EC-232
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NØ
Ø3
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0.96
0.24
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0.00
CØNCENTRATIØN (PPM)
0
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100
150
200
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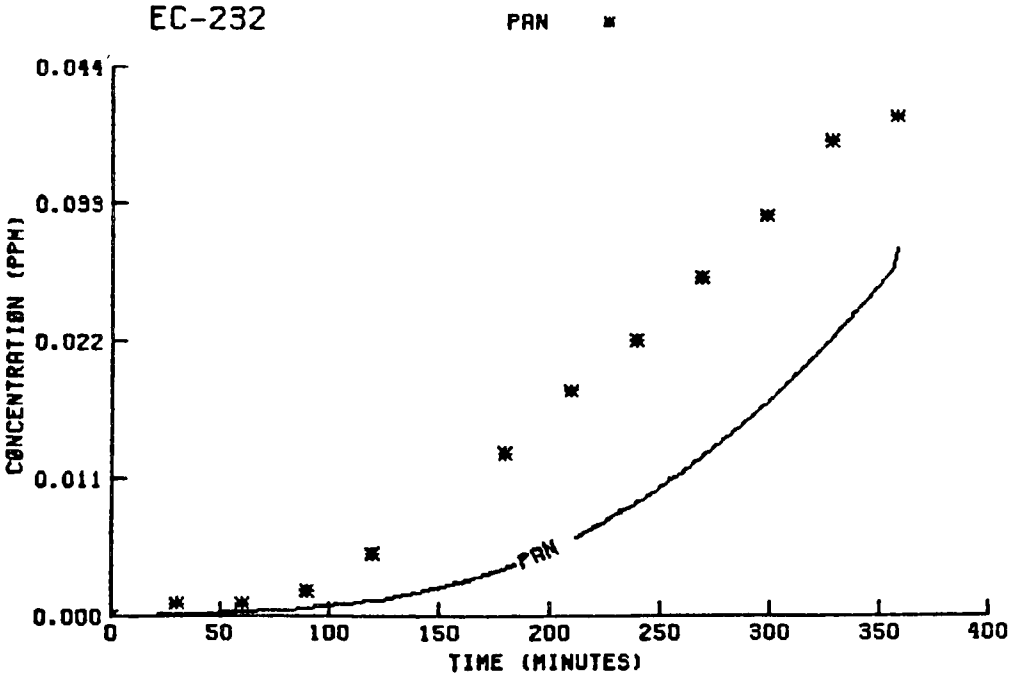
300
350
400
TIME (MINUTES)


EC-232
PAN
0.044
0.033
0.022
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CØNCENTRATIØN (PPM)
0
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200
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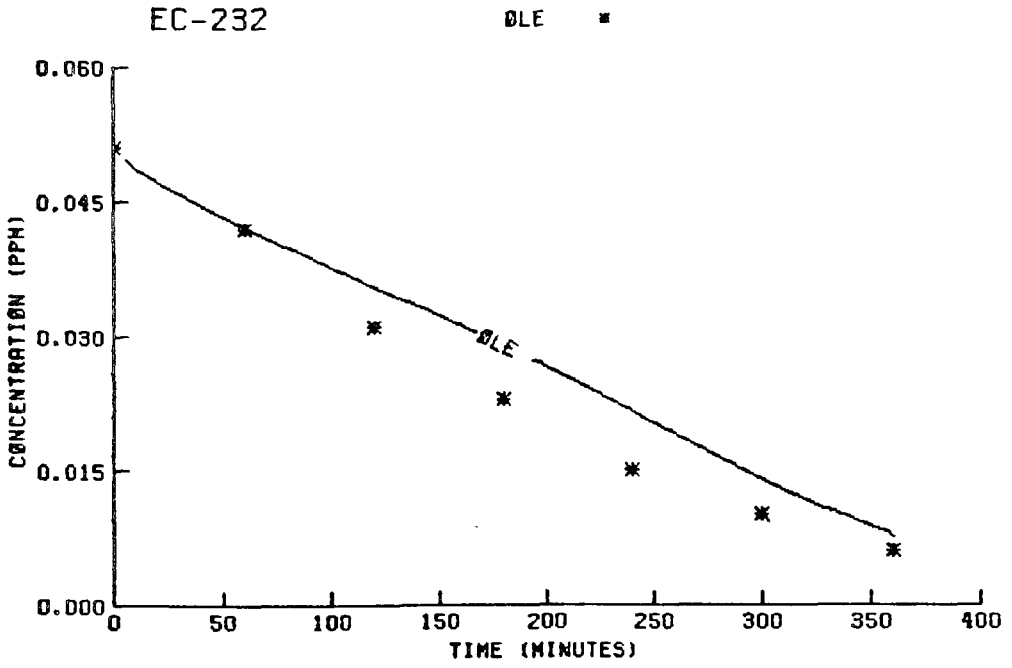
TIME (MINUTES)


EC-232
ØLE
0.060
0.045
0.030
0.015
0.000
CØNCENTRATIØN (PPM)
ØLE
0
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150
200
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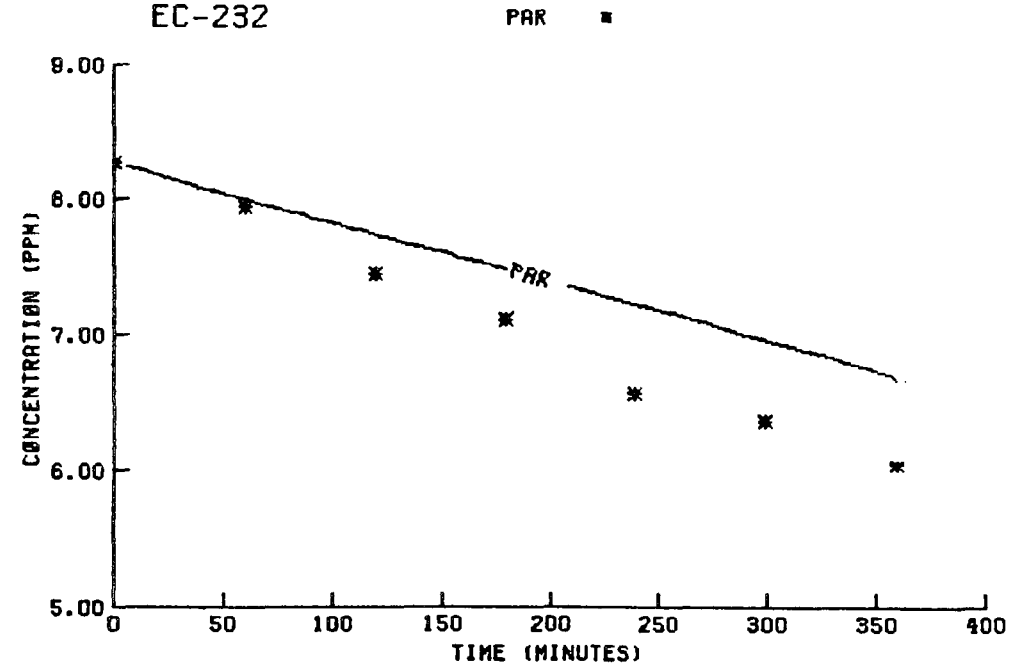
300
350
400
TIME (MINUTES)


EC-232
PAR
8.00
7.00
6.00
5.00
CØNCENTRATIØN (PPM)
PAR
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150
200
250
300
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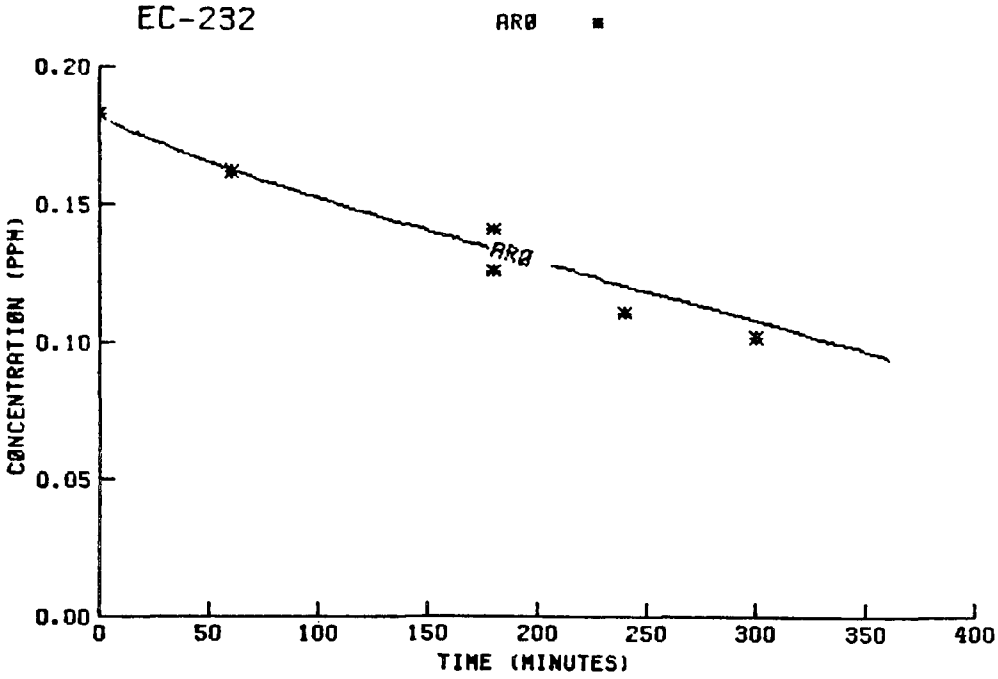
400
TIME (MINUTES)


EC-232
ARØ
0.20
0.15
0.10
0.05
0.00
CØNCENTRATIØN (PPM)
ARØ
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150
200
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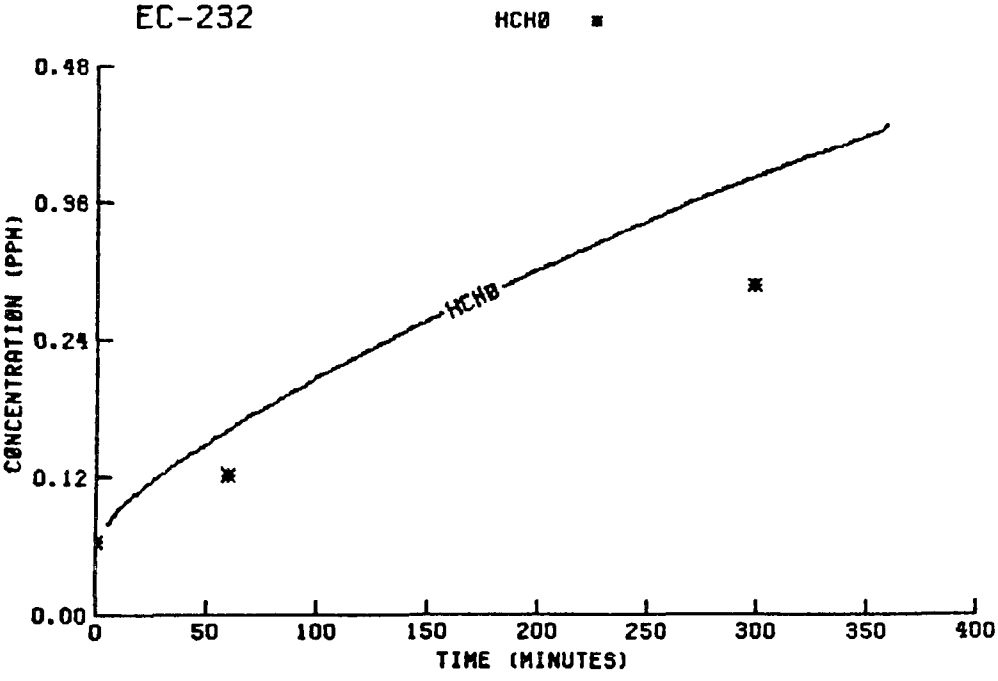
TIME (MINUTES)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0.36
0.24
0.12
0.00
CØNCENTRATIØN (PPM)
HCHØ
0
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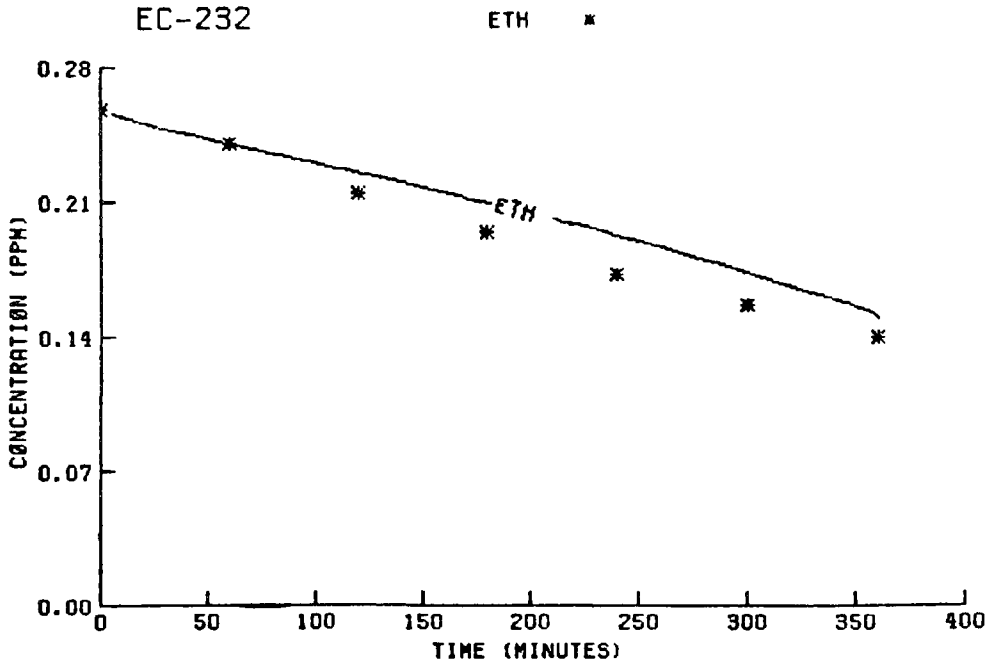
100
150
200
250
300
350
400
TIME (MINUTES)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ETH
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0.14
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CONCENTRATION (PPM)
ETH
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300
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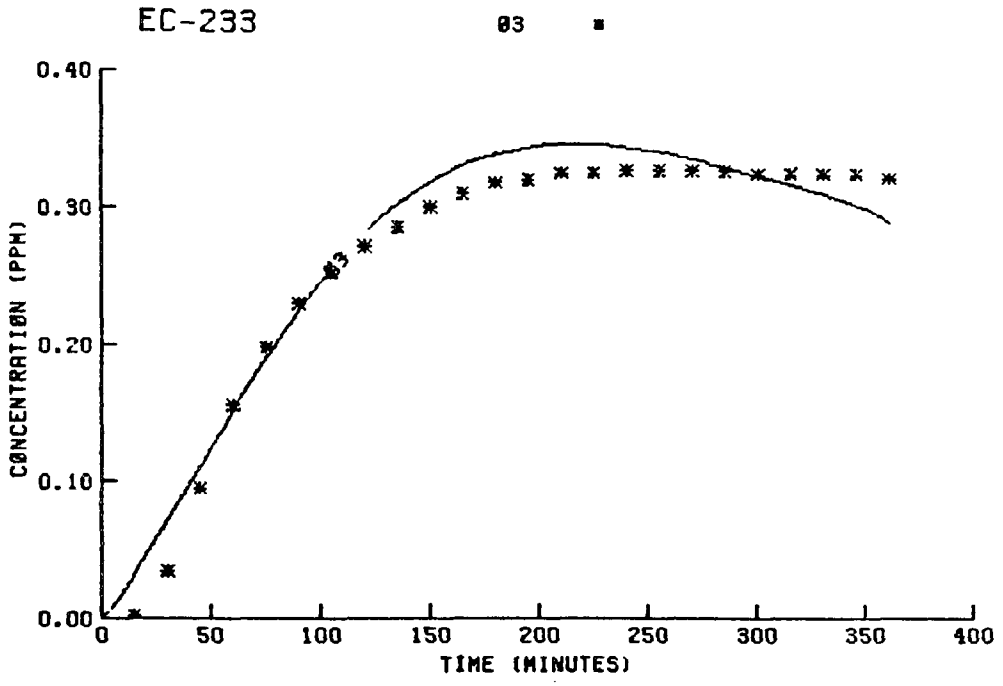
400
TIME (MINUTES)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0.30
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0.10
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CONCENTRATION (PPM)
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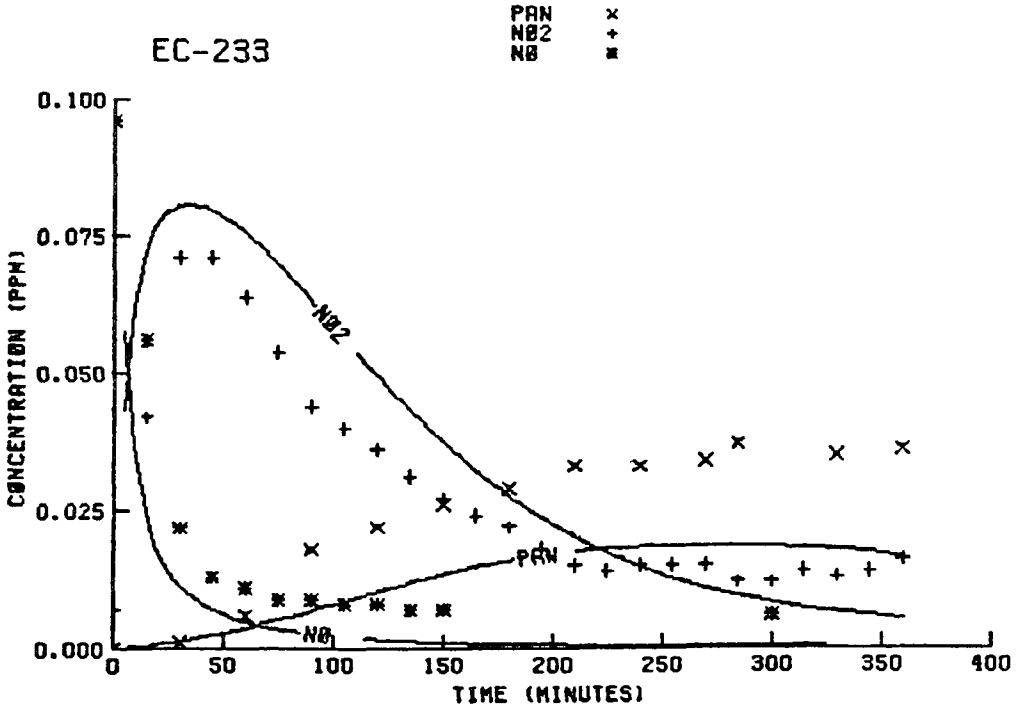
300
350
400
TIME (MINUTES)


PAN
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NO
EC-233
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0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
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PAN
NO
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150
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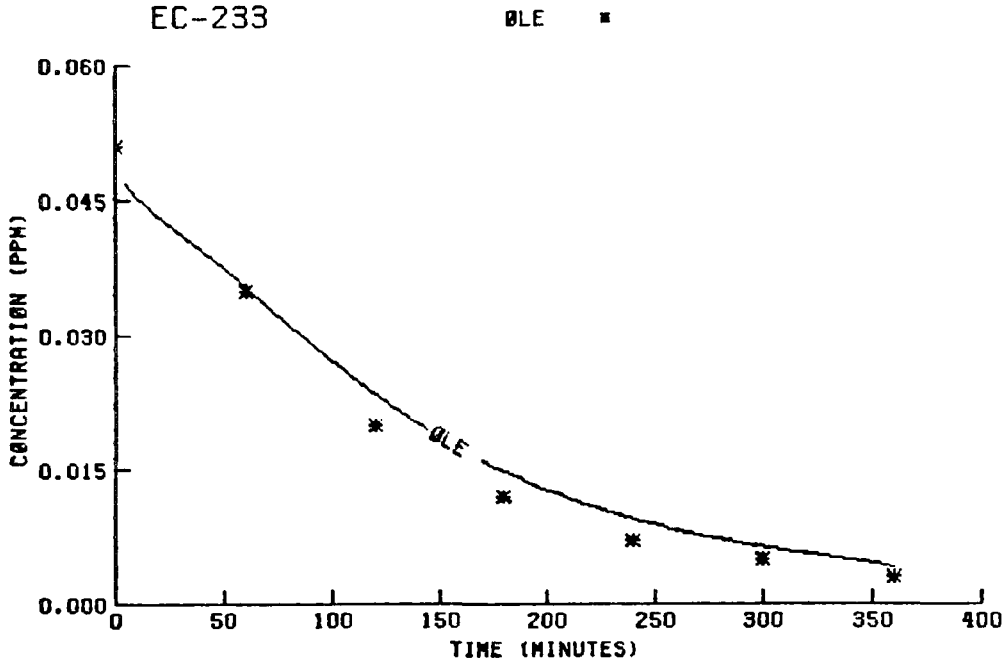
TIME (MINUTES)


EC-233
ØLE
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0.045
0.030
0.015
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ØLE
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150
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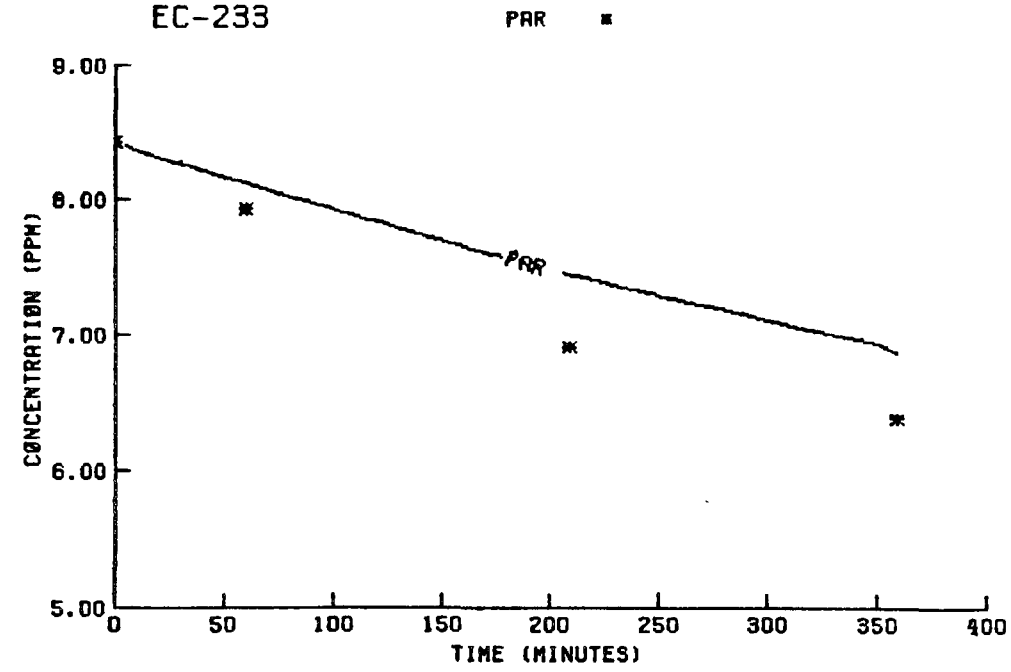
400
TIME (MINUTES)


EC-233
PAR
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8.00
7.00
6.00
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CØNCENTRATIØN (PPM)
PAR
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150
200
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300
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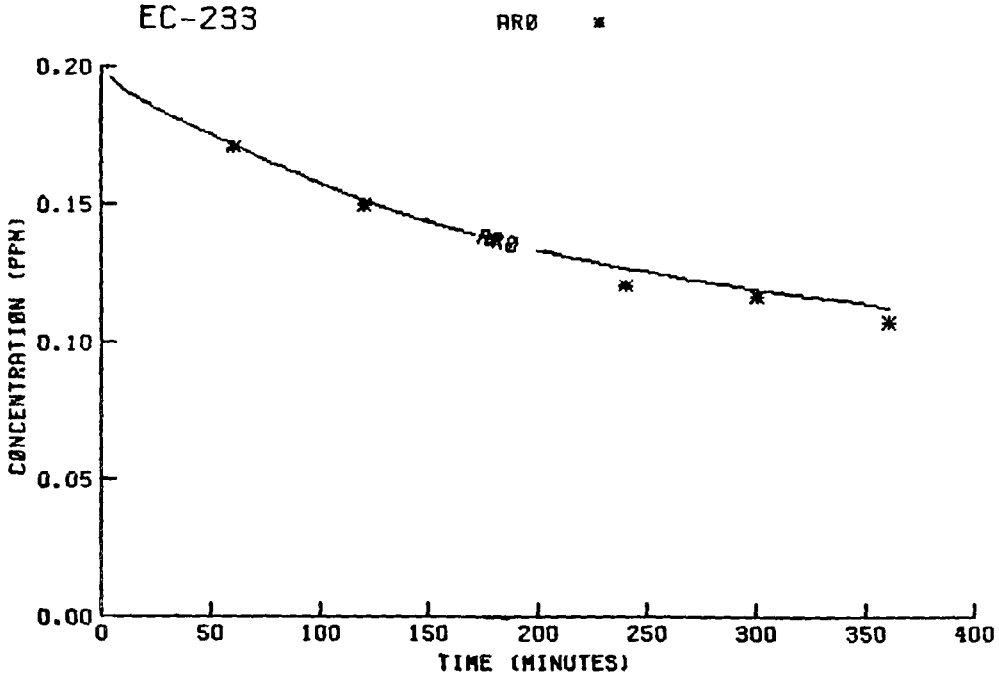
400
TIME (MINUTES)


EC-233
ARØ
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0.15
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0.05
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CONCENTRATION (PPM)
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300
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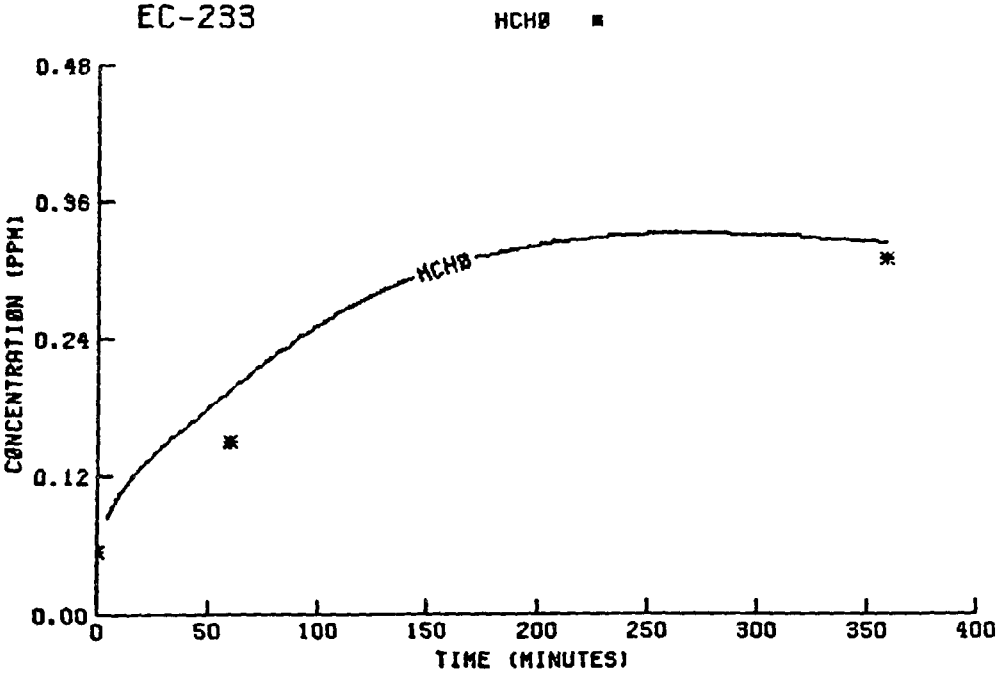
TIME (MINUTES)


EC-233
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0.36
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0.12
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CONCENTRATION (PPM)
0
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100
150
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250
300
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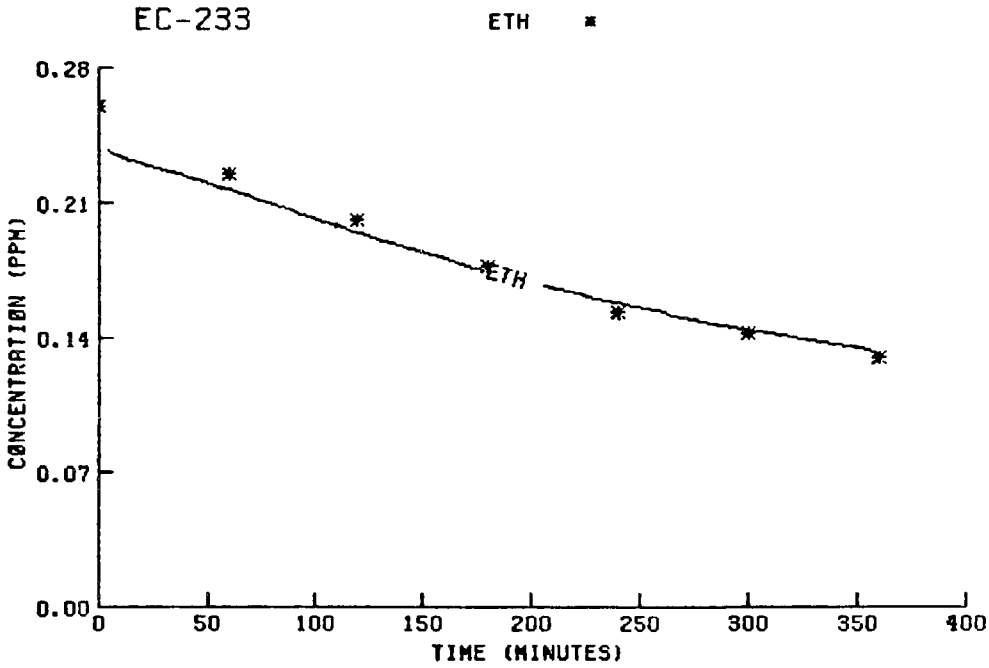
400
TIME (MINUTES)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CONCENTRATION (PPM)
ETH
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100
150
200
250
300
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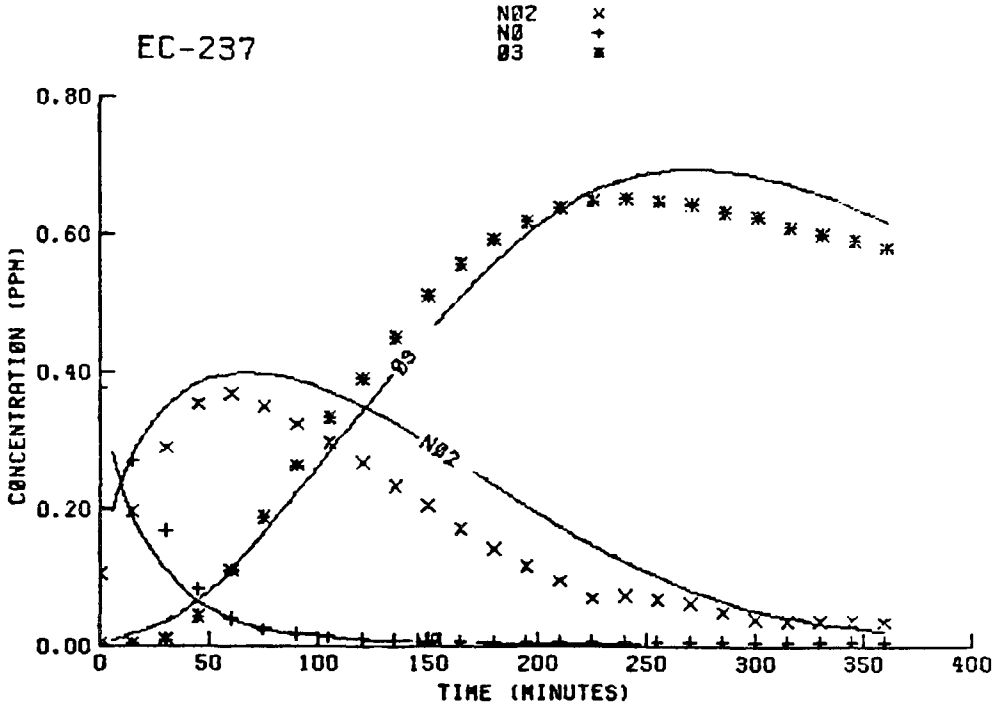
400
TIME (MINUTES)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NØ
Ø3
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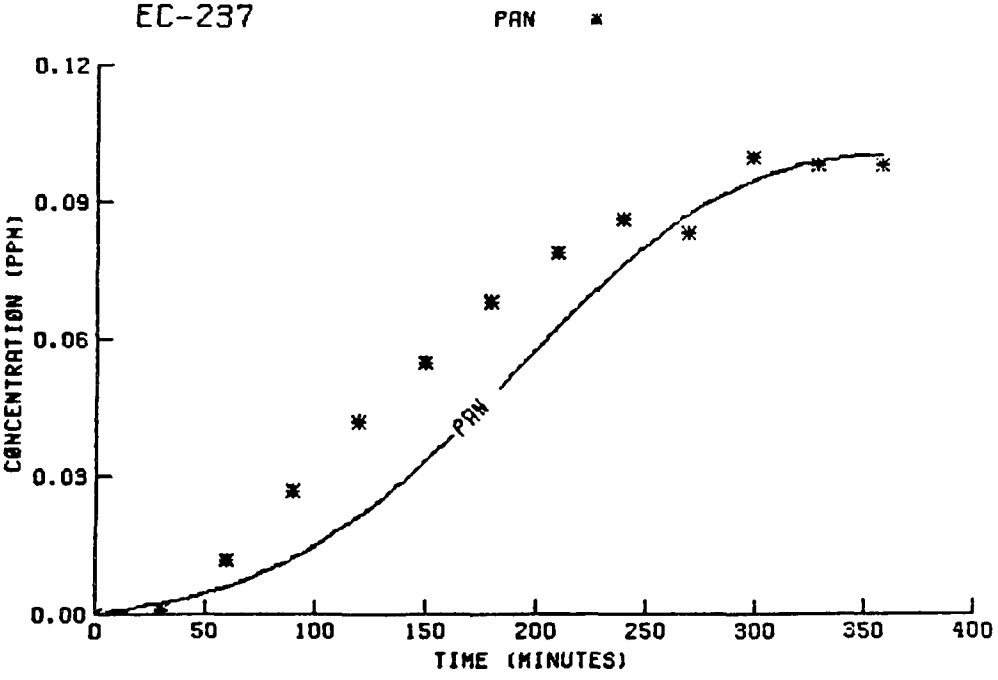
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
Ø3
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-237
PAN
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0.09
0.06
0.03
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CØNCENTRATIØN (PPM)
PAN
0
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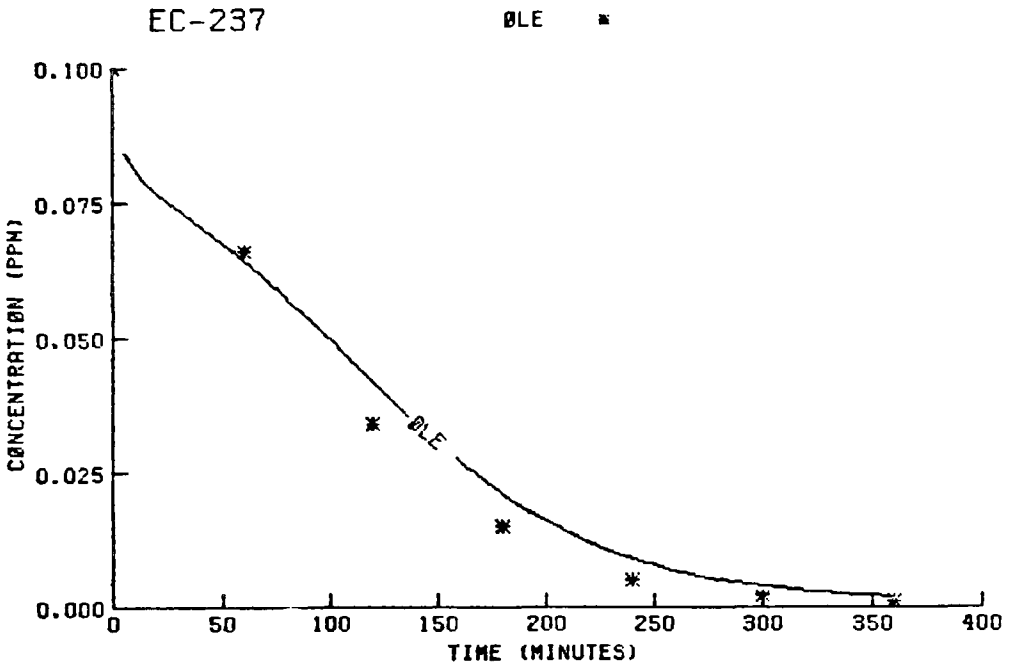
100
150
200
250
300
350
400
TIME (MINUTES)


EC-237
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0.050
0.025
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CØNCENTRATIØN (PPM)
ØLE
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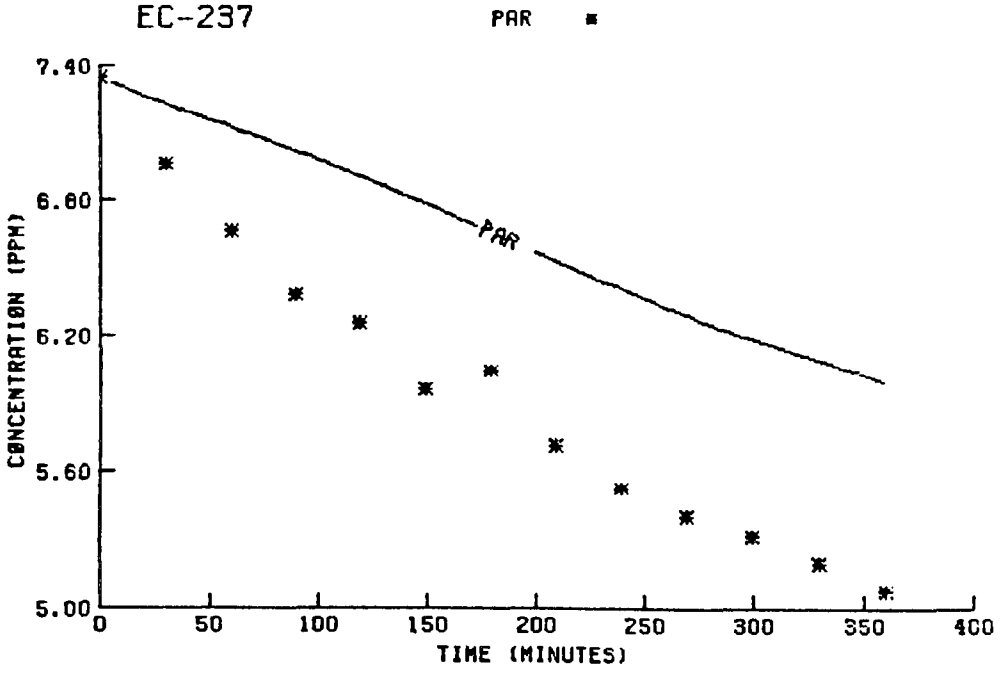
150
200
250
300
350
400
TIME (MINUTES)


EC-237
PAR
7.40
6.80
6.20
5.60
5.00
CØNCENTRATIØN (PPM)
PAR
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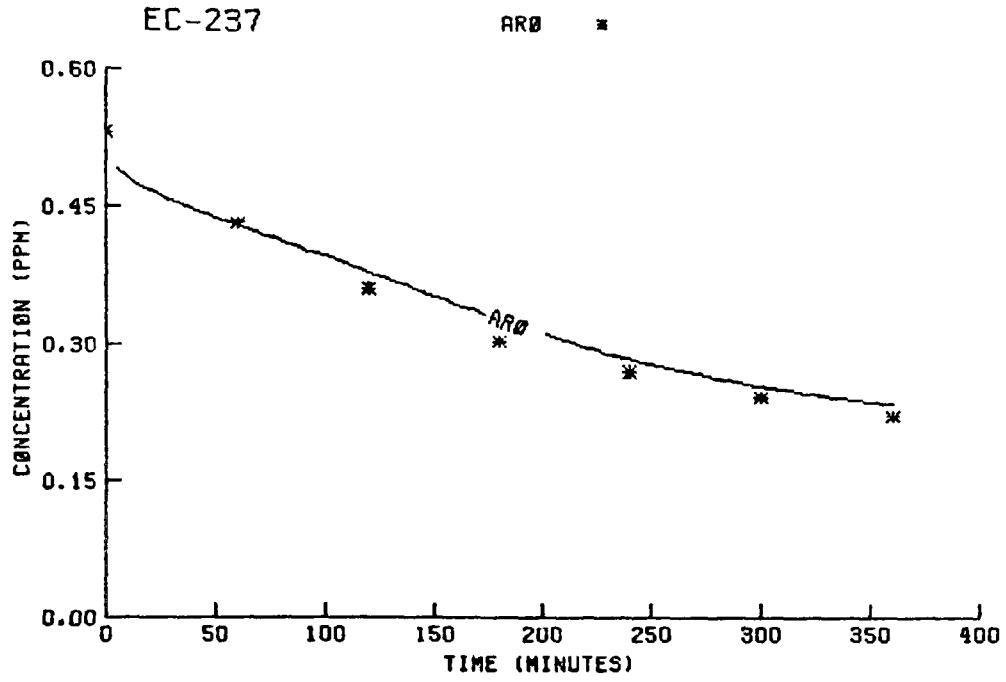
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-237
ARØ
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0.45
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CØNCENTRATIØN (PPM)
ARØ
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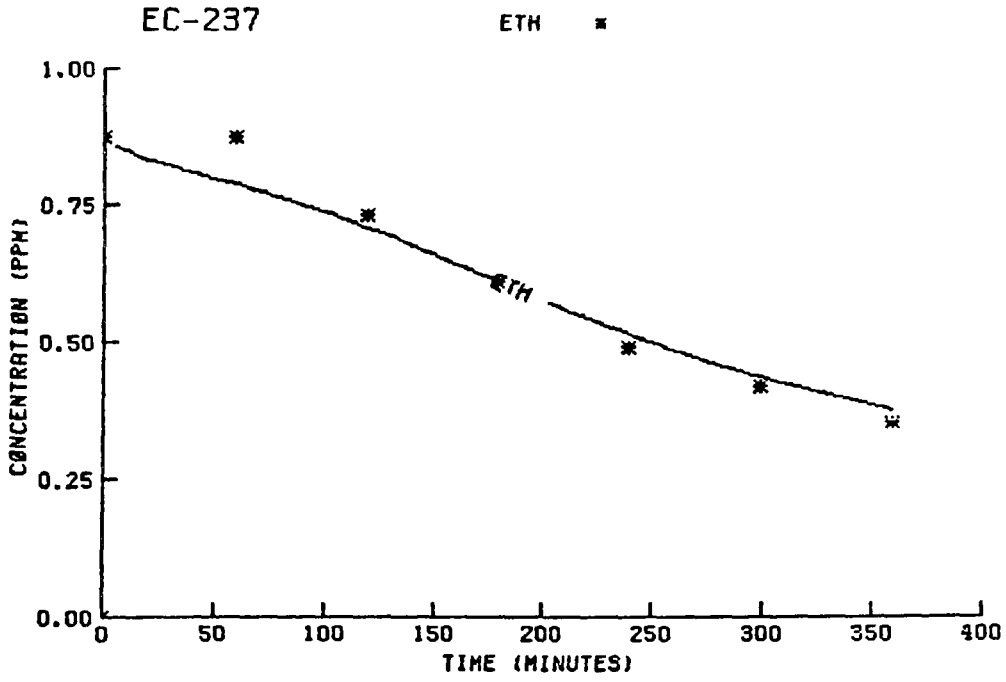
150
200
250
300
350
400
TIME (MINUTES)


EC-237
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CØNCENTRATIØN (PPM)
ETH
0
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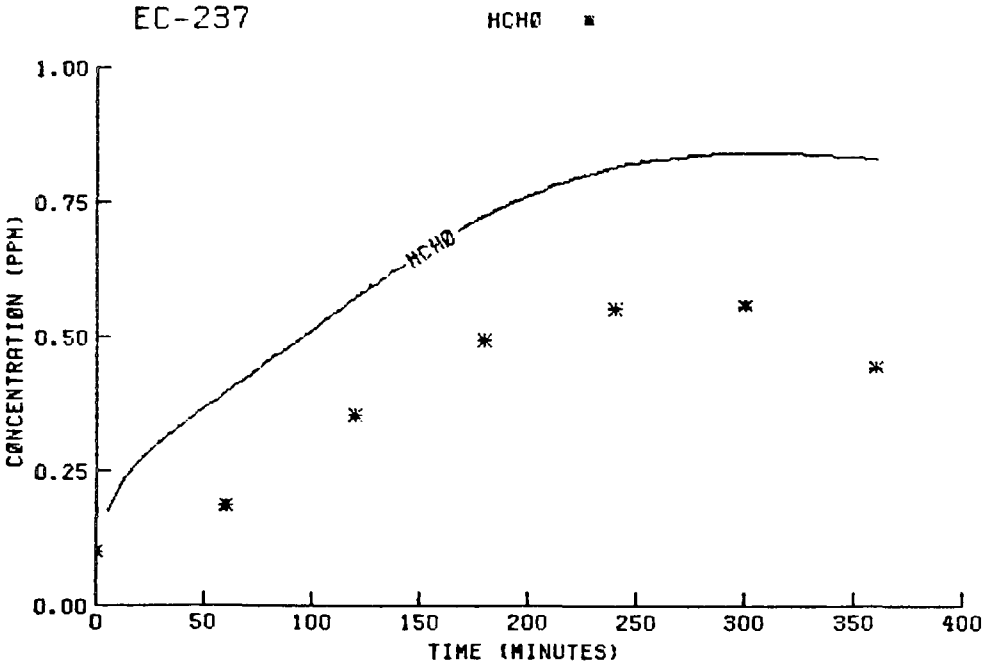
100
150
200
250
300
350
400
TIME (MINUTES)


EC-237
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0.50
0.25
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CØNCENTRATIØN (PPH)
HCHØ
0
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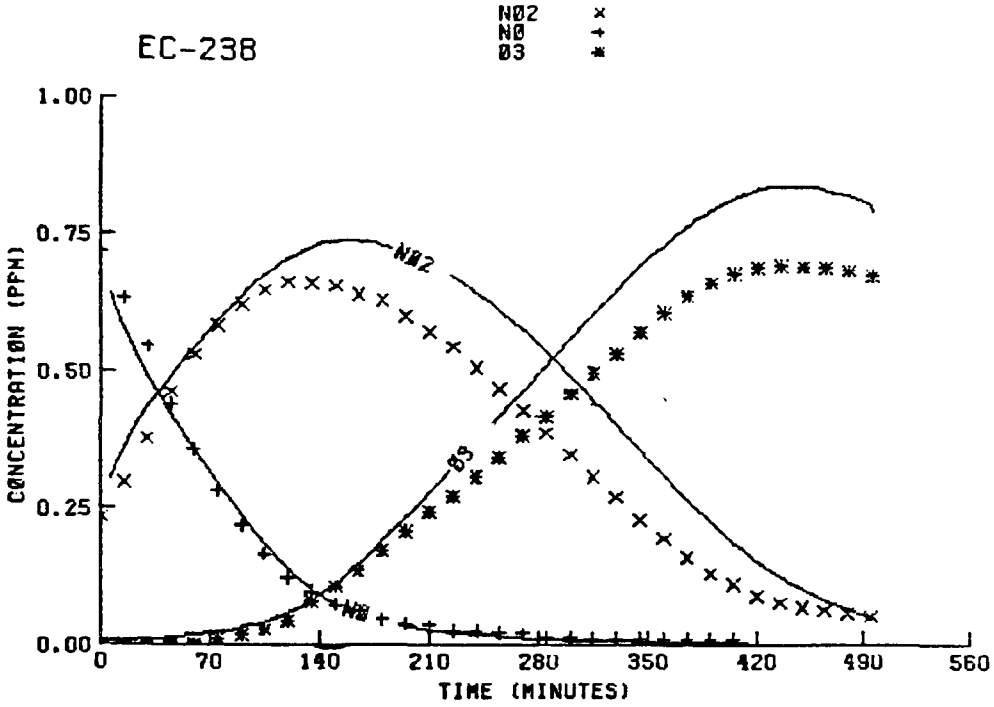
150
200
250
300
350
400
TIME (MINUTES)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Ø3
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0.25
0.00
CØNCENTRATIØN (PPH)
NØ2
Ø3
NØ
0
70
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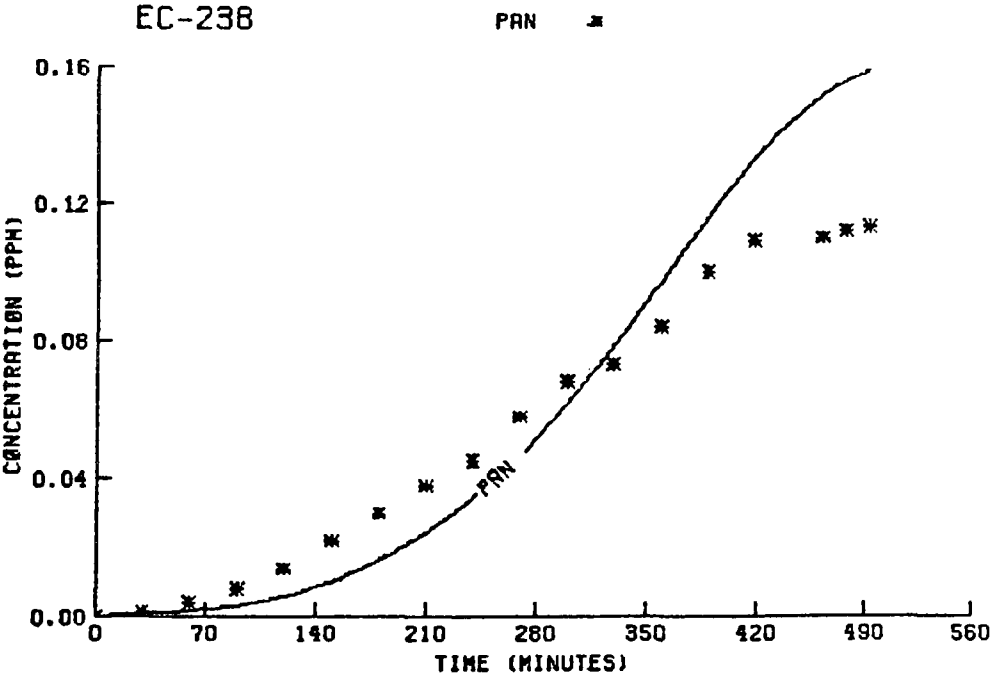
210
280
350
420
490
560
TIME (MINUTES)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CØNCENTRATIØN (PPH)
PAN
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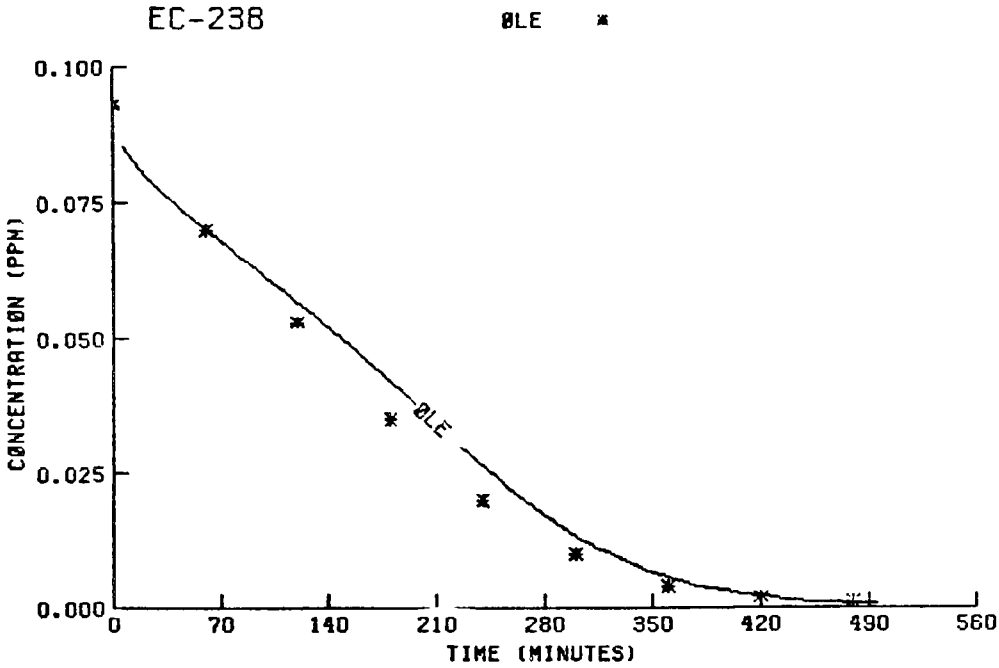
210
280
350
420
490
560
TIME (MINUTES)


EC-238
BLE
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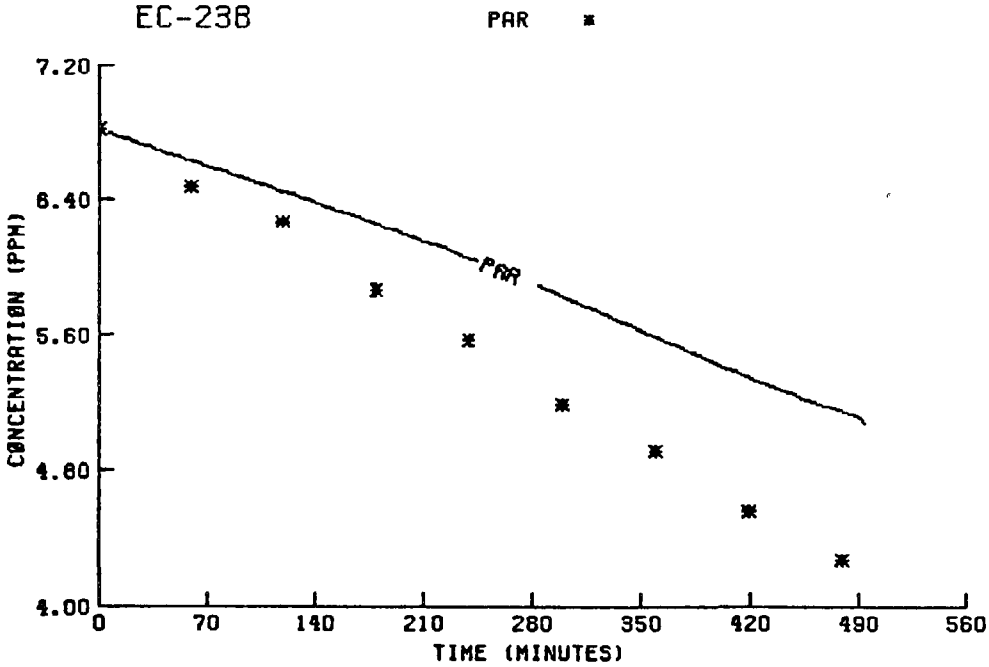
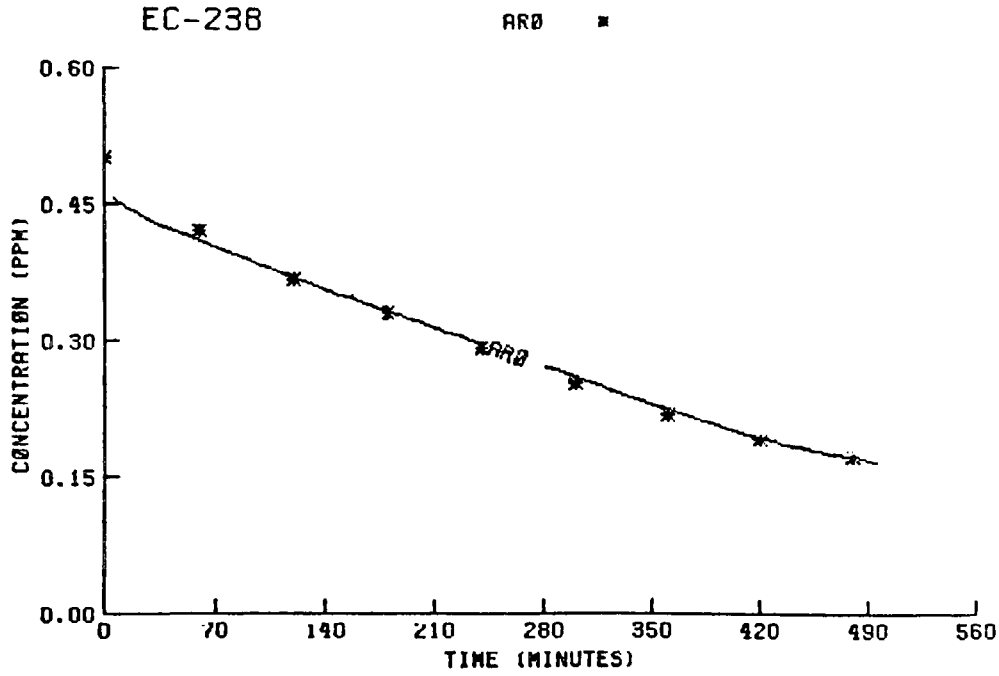
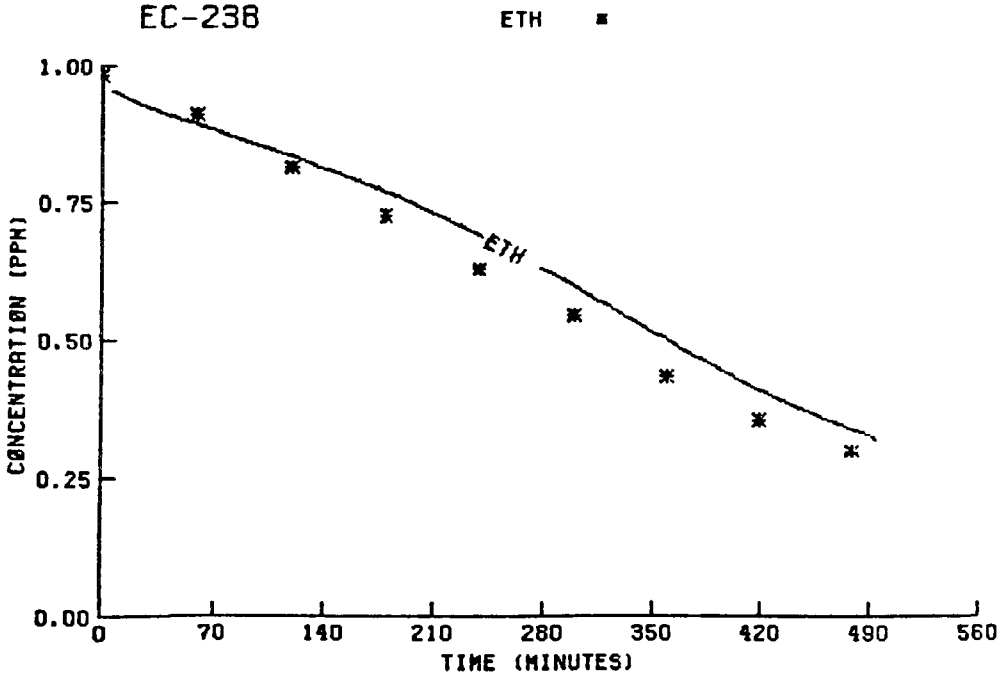
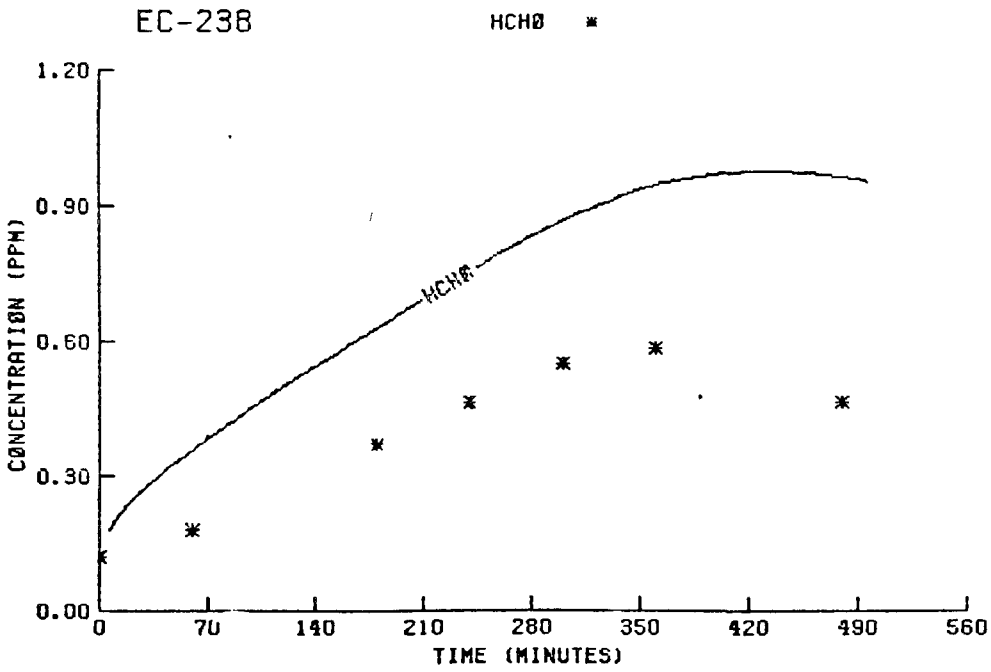
0.075
0.050
0.025
0.000
CONCENTRATION (PPM)
BLE
0
70
140
210
280
350
420
490
560
TIME (MINUTES)


EC-238
PAR
7.20
6.40
5.60
4.80
4.00
CONCENTRATION (PPM)
PAR
0
70
140
210
280
350
420
490
560
TIME (MINUTES)


EC-238
ARØ
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
ARØ
0
70
140
210
280
350
420
490
560
TIME (MINUTES)


EC-238
ETH
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
ETH
0
70
140
210
280
350
420
490
560
TIME (MINUTES)


EC-238
HCHØ *
1.20
0.90
0.60
0.30
0.00
CØNCENTRATIØN (PPM)
HCHØ
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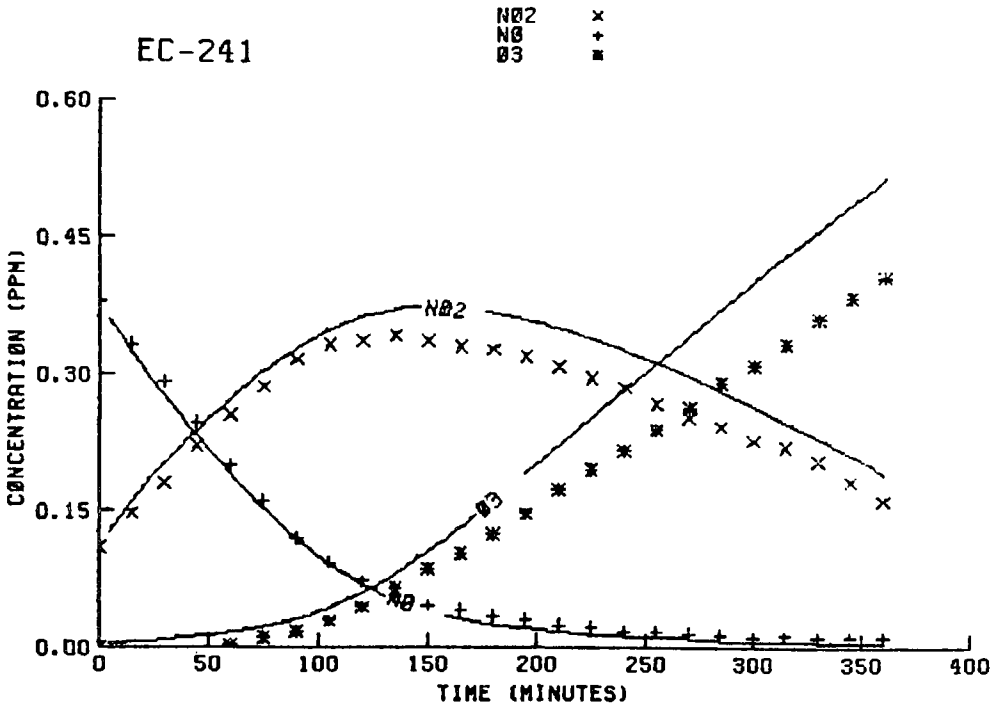
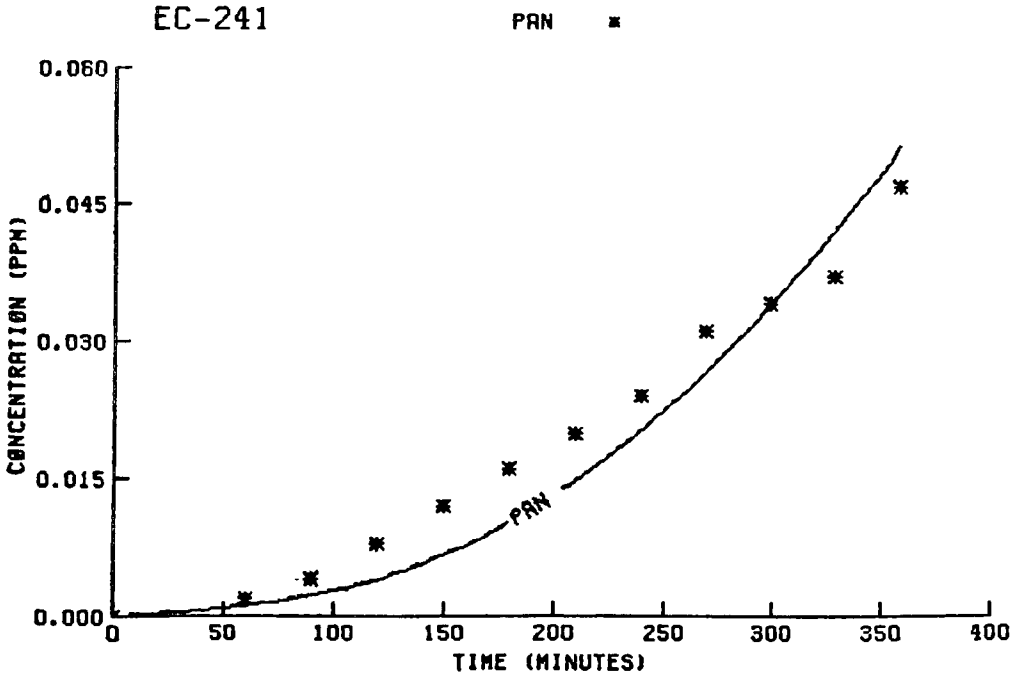
140
210
280
350
420
490
560
TIME (MINUTES)


EC-241
NØ2 ×
NØ +
Ø3 *
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
NØ2
Ø3
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


EC-241
PAN *
0.060
0.045
0.030
0.015
0.000
CØNCENTRATIØN (PPM)
PAN
0
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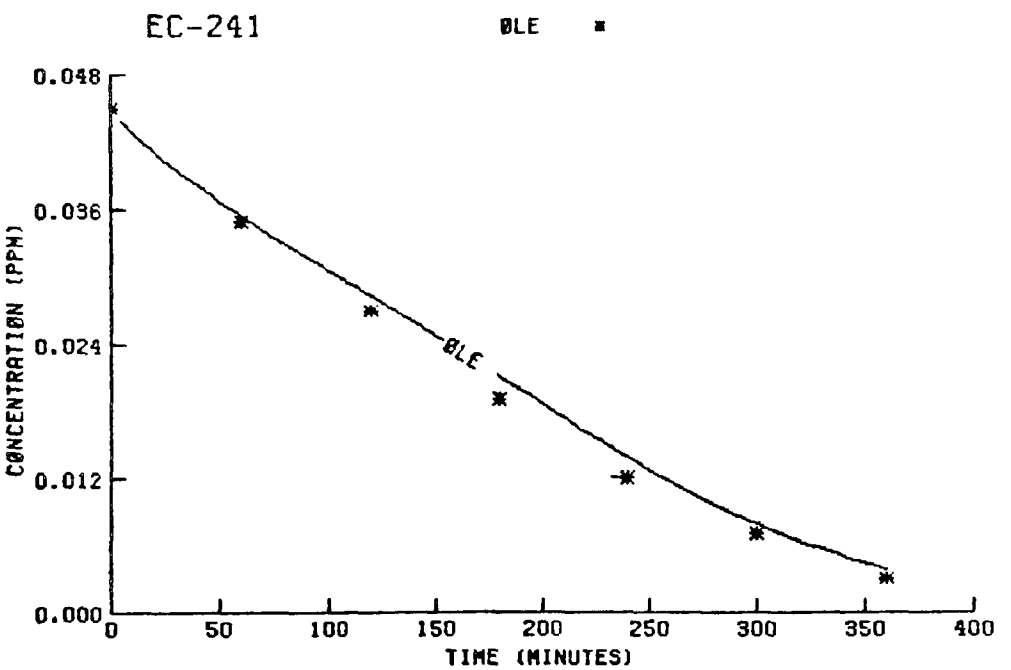
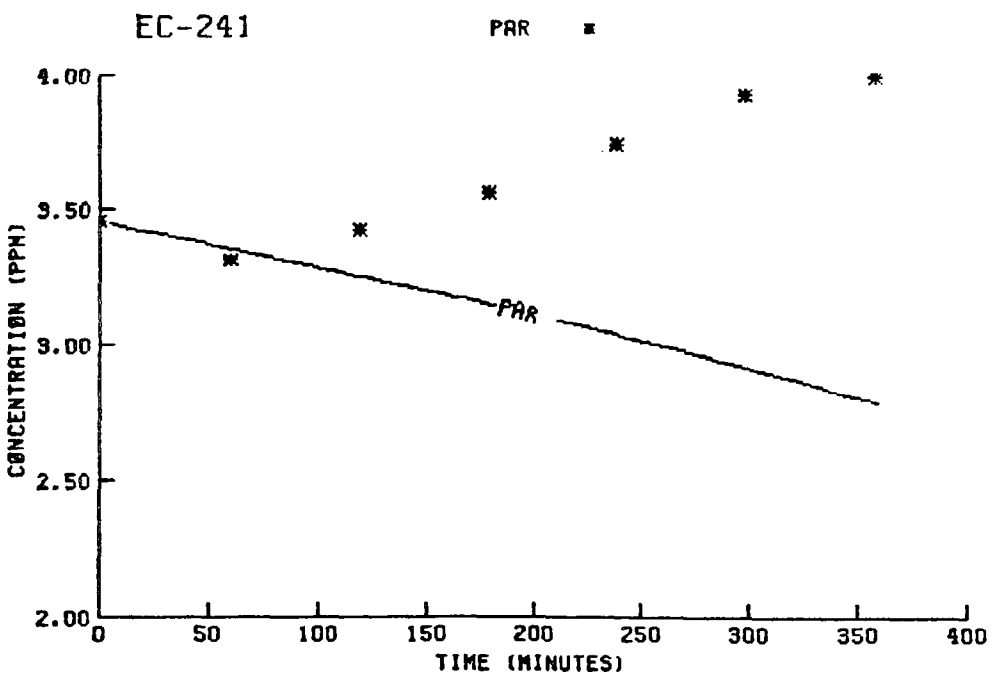
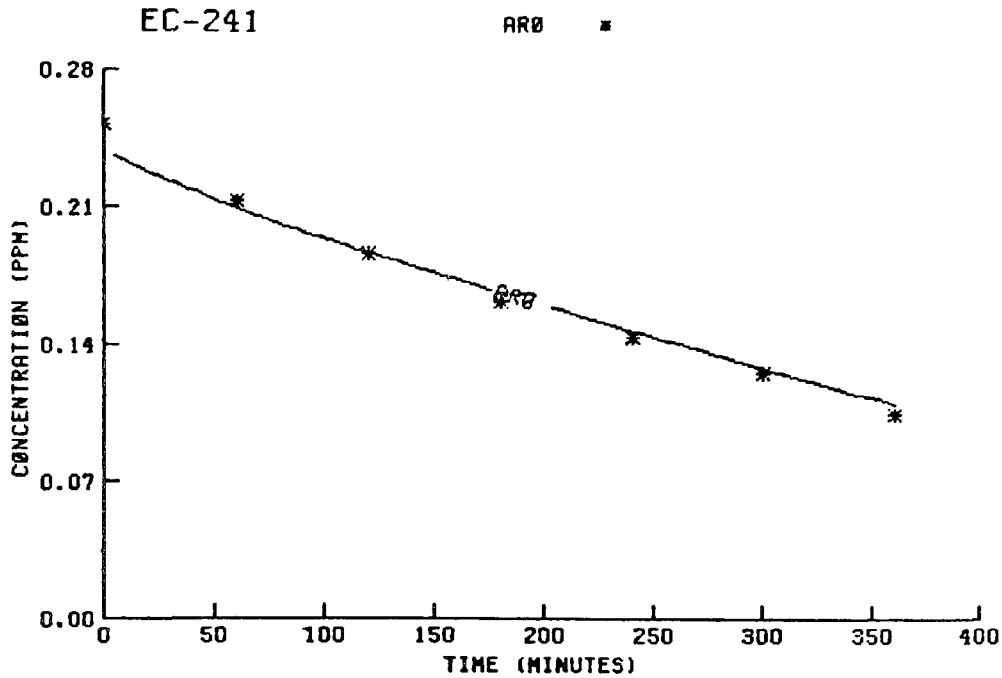
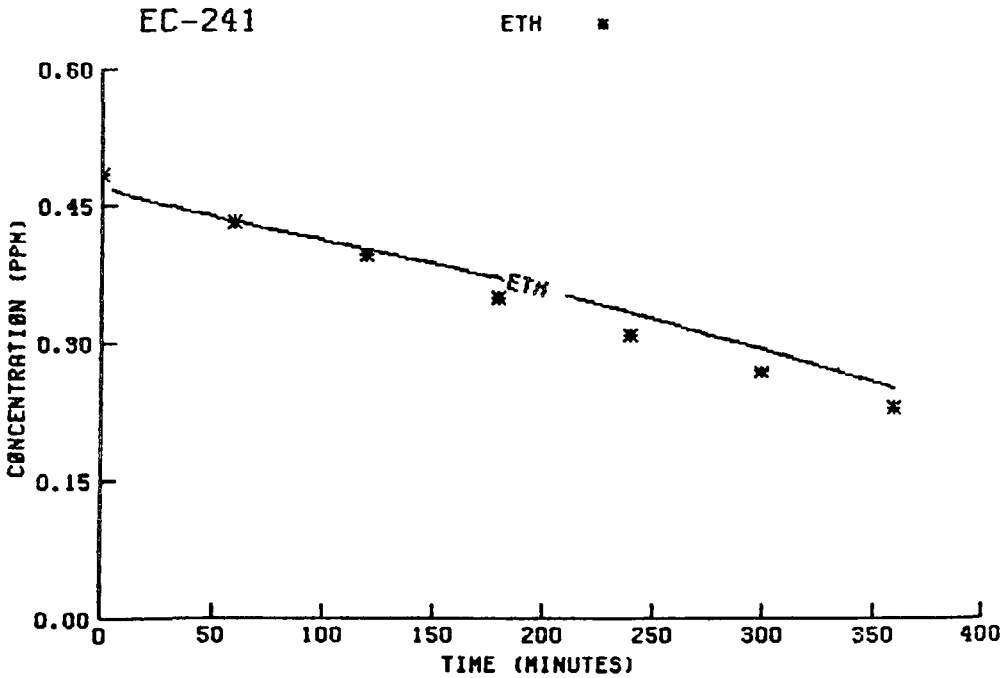
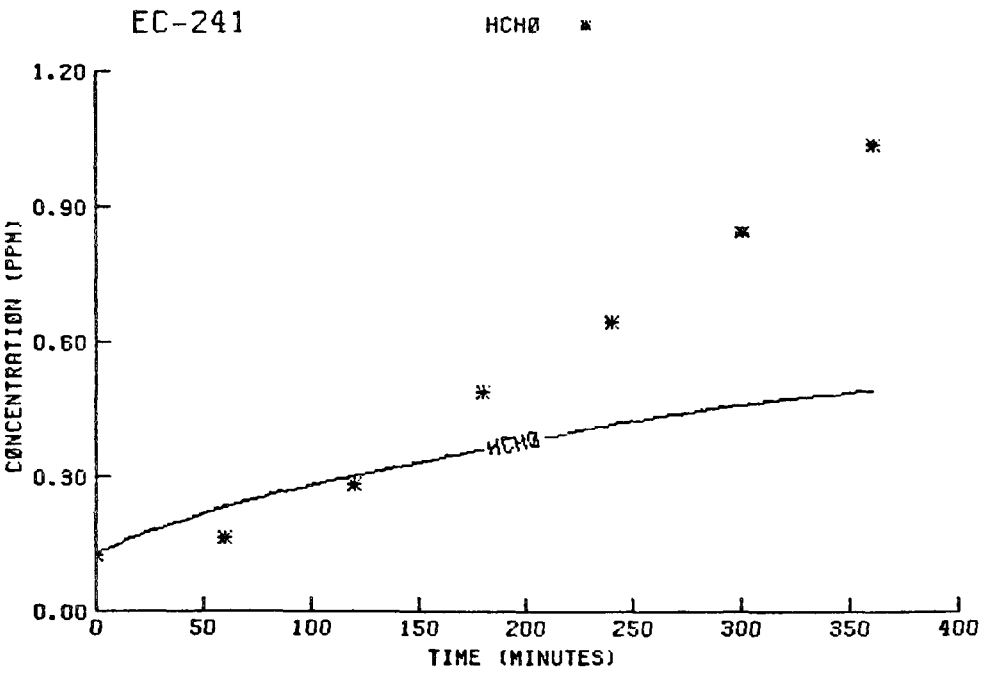
100
150
200
250
300
350
400
TIME (MINUTES)

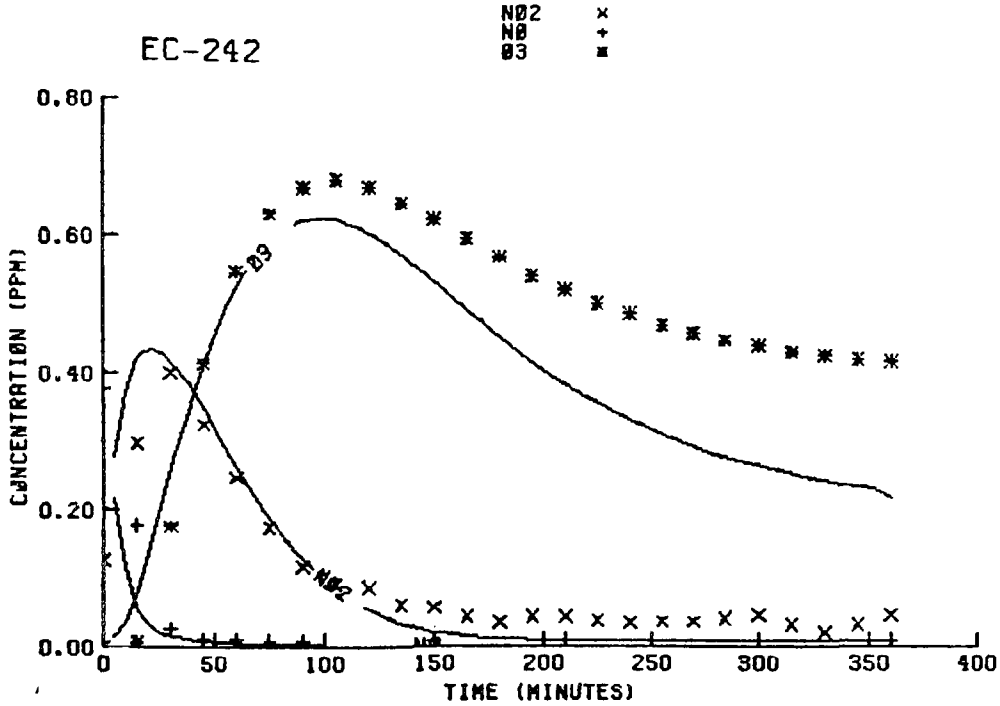

EC-241
ØLE
0.048
0.036
0.024
0.012
0.000
CØNCENTRATIØN (PPM)
ØLE
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

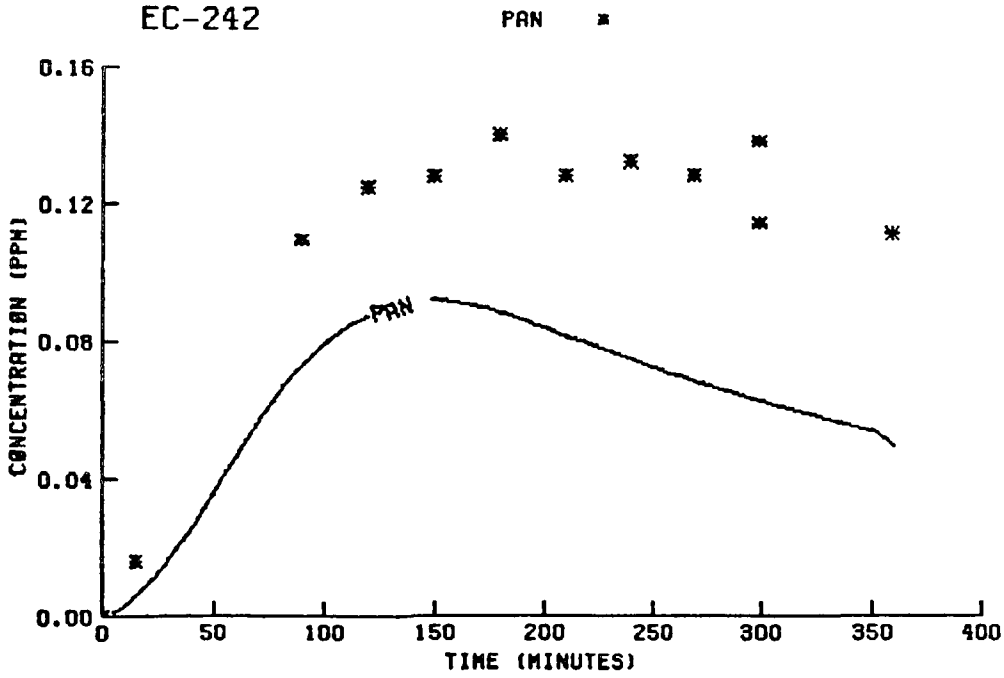

EC-241
PAR
4.00
3.50
3.00
2.50
2.00
CØNCENTRATIØN (PPM)
PAR
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

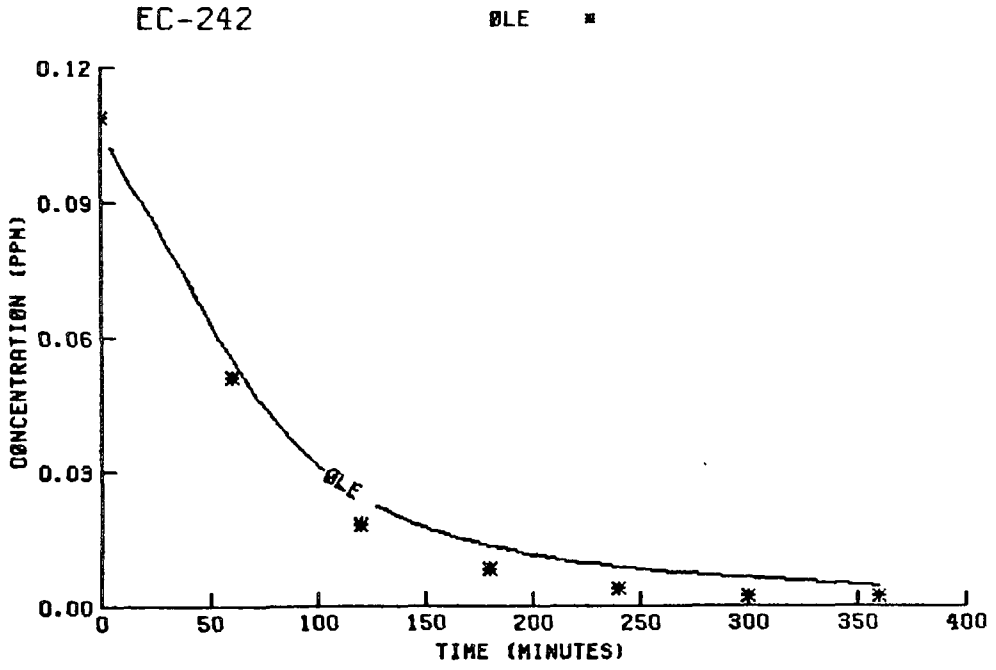

EC-241
ARØ
0.28
0.21
0.14
0.07
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

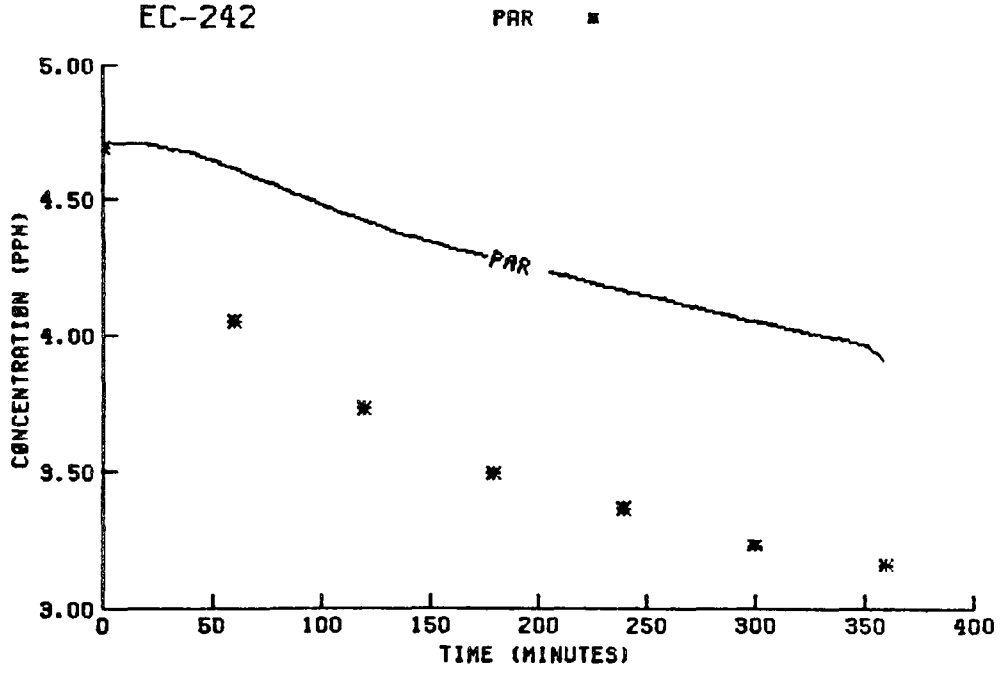

EC-241
ETH
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

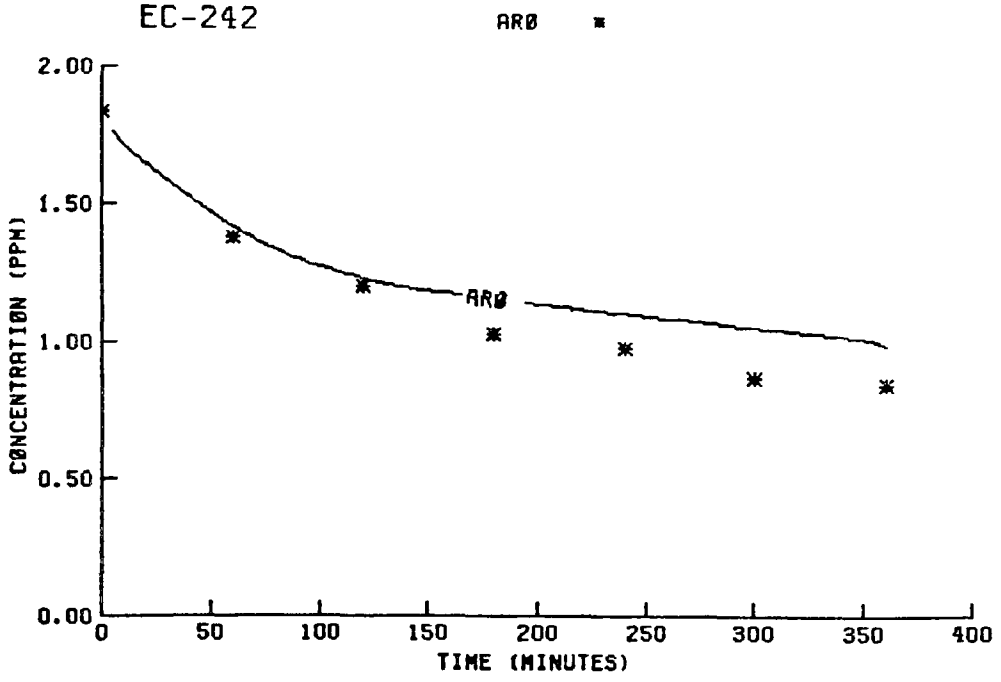

EC-241
HCHØ
1.20
0.90
0.60
0.30
0.00
CØNCENTRATIØN (PPM)
HCHØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

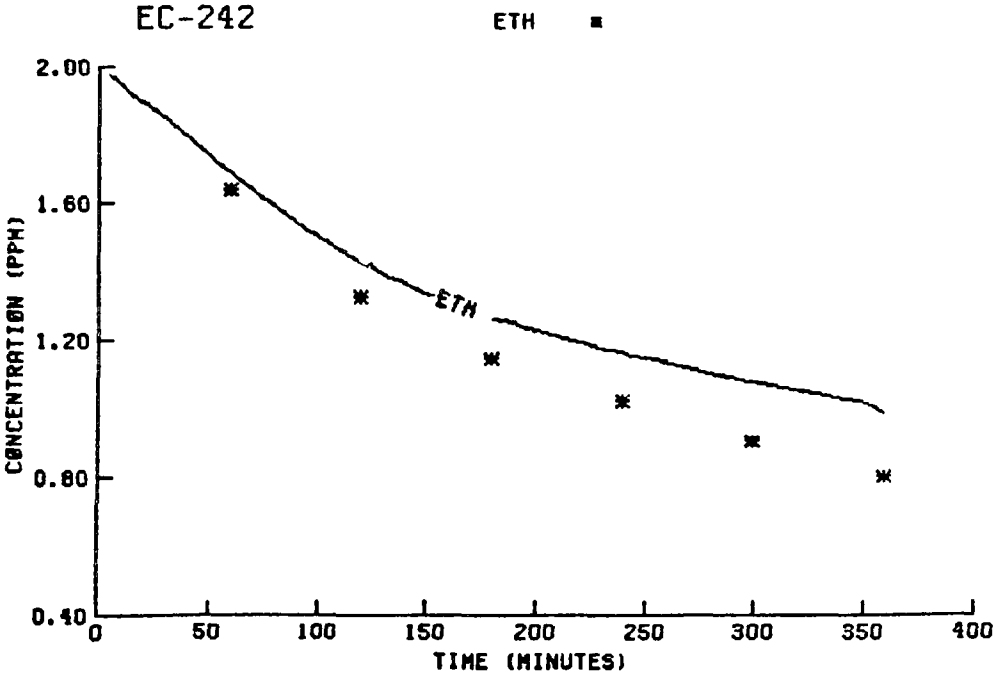

EC-242
NØ2
NØ
Ø3
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
Ø3
NØ2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

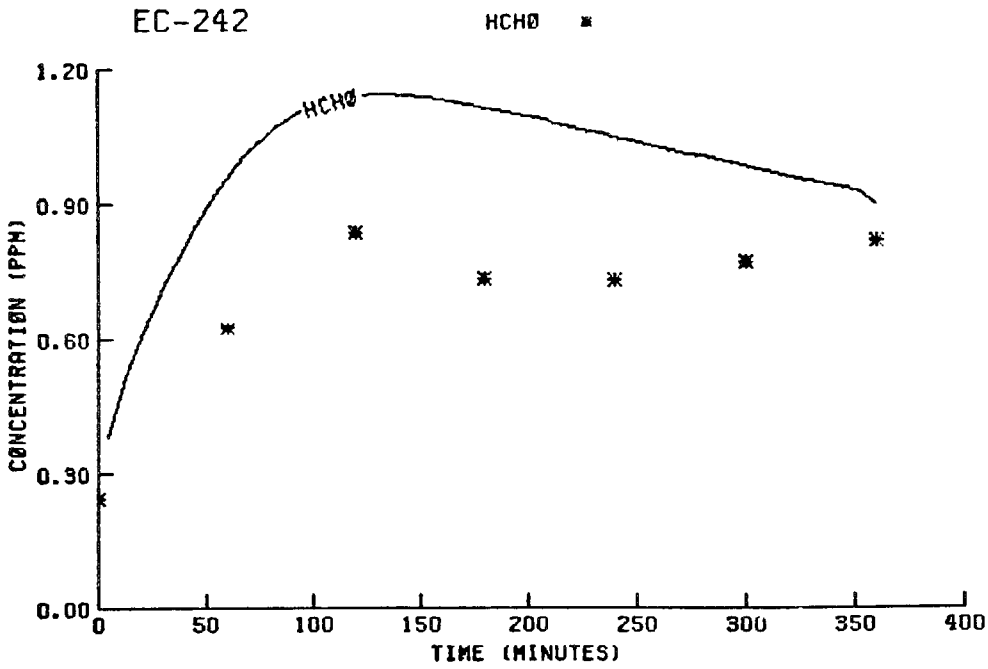

EC-242
PAN
0.16
0.12
0.08
0.04
0.00
CØNCENTRATIØN (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

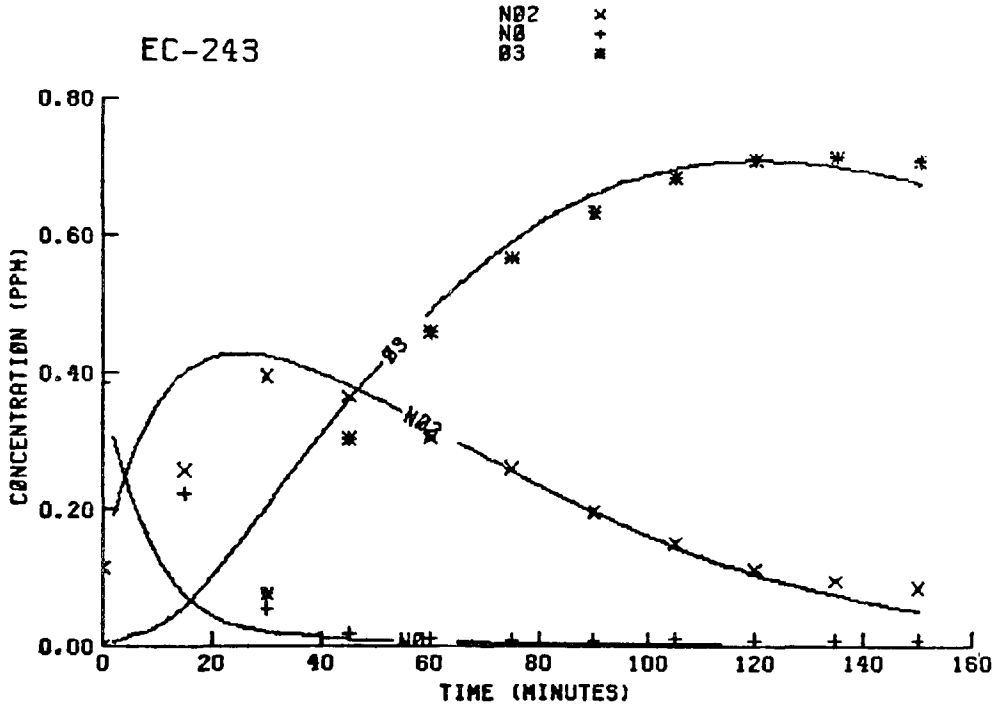

EC-242
ØLE
0.12
0.09
0.06
0.03
0.00
CØNCENTRATIØN (PPM)
ØLE
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

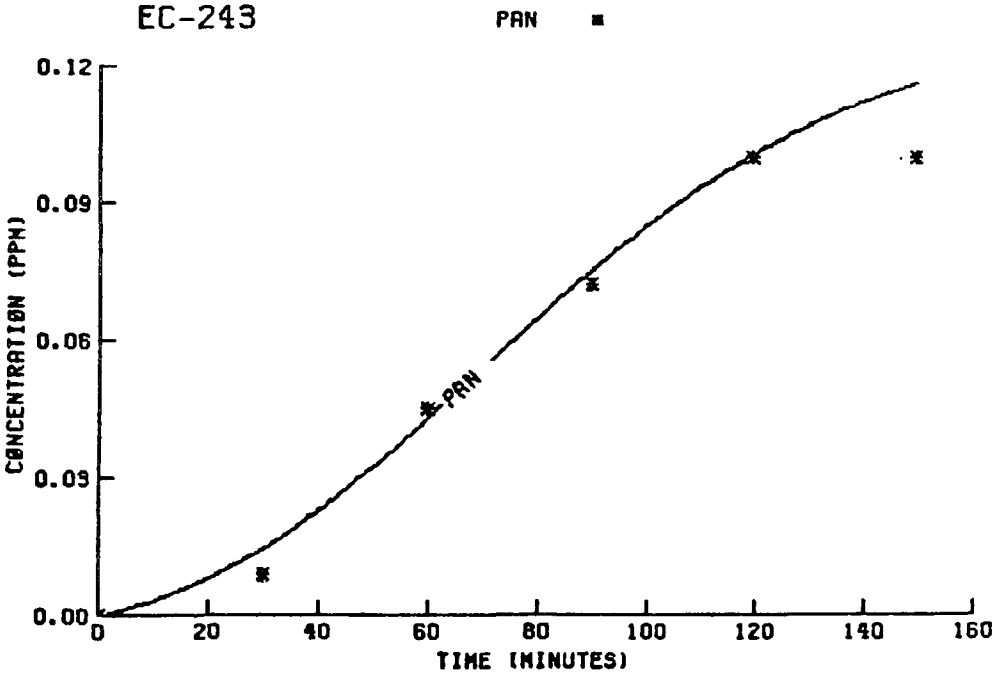

EC-242
PAR
5.00
4.50
4.00
3.50
3.00
CØNCENTRATIØN (PPM)
PAR
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

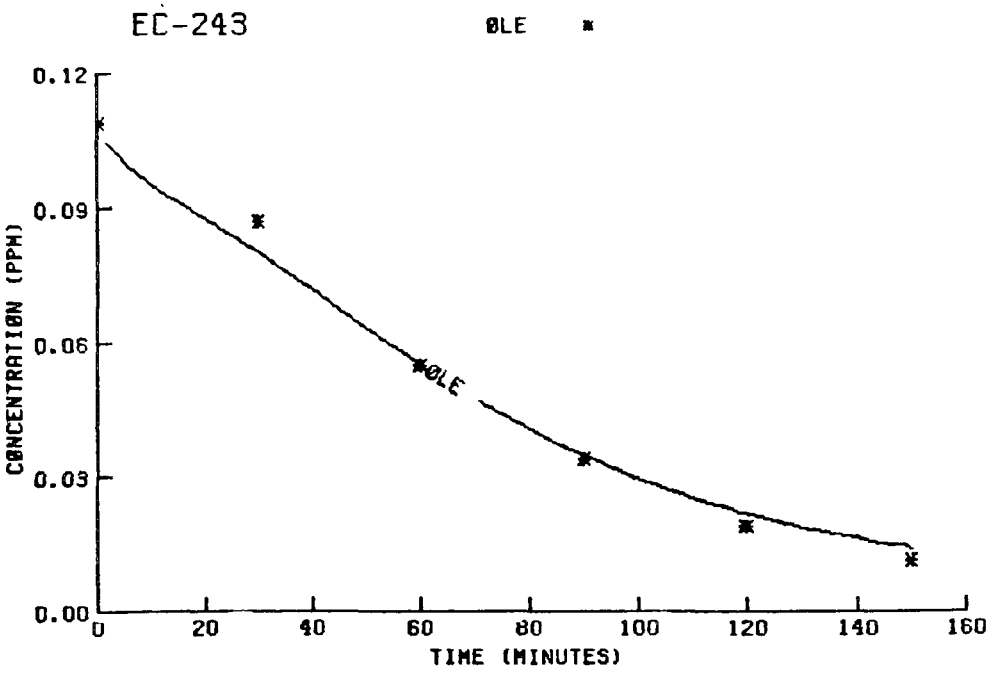

EC-242
ARØ
2.00
1.50
1.00
0.50
0.00
CONCENTRATION (PPM)
ARØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

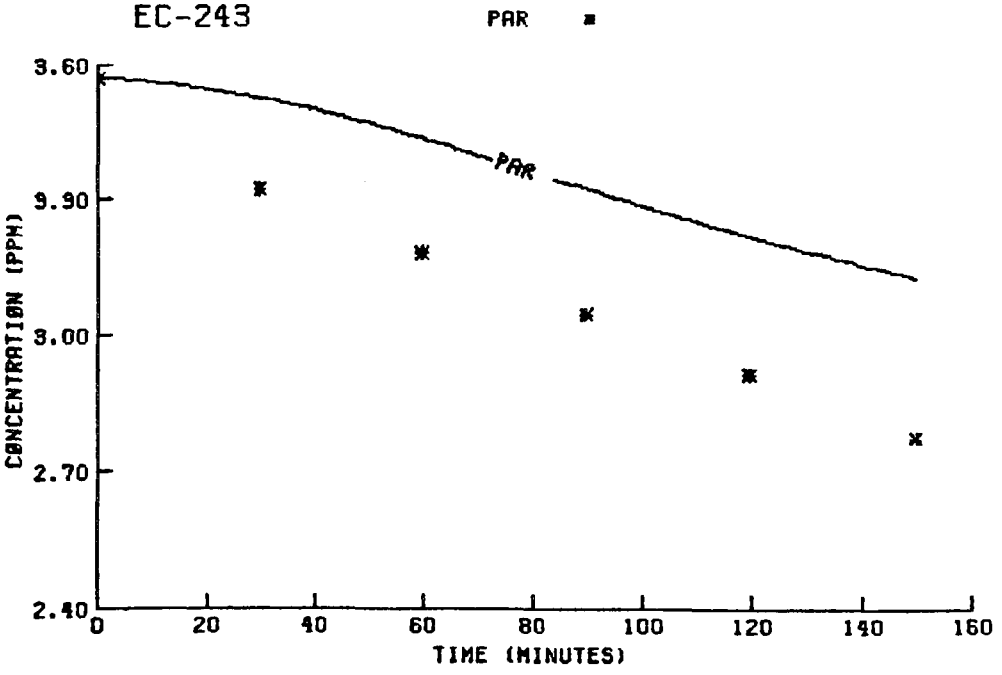

EC-242
ETH
2.00
1.60
1.20
0.80
0.40
CONCENTRATION (PPM)
ETH
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

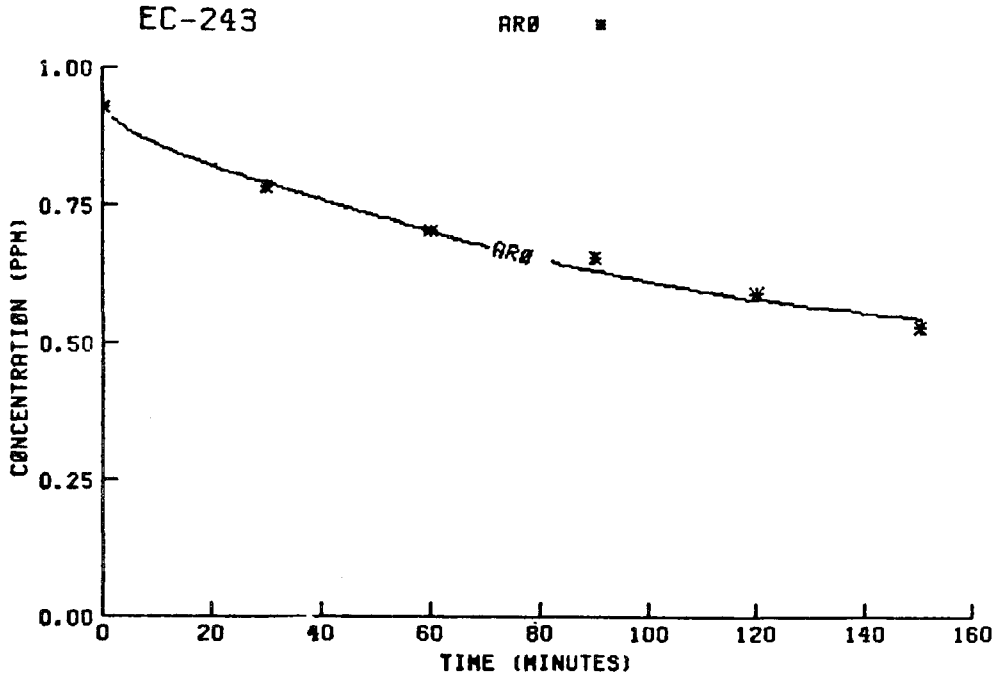

EC-242
HCHØ
1.20
0.90
0.60
0.30
0.00
CØNCENTRATIØN (PPM)
HCHØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

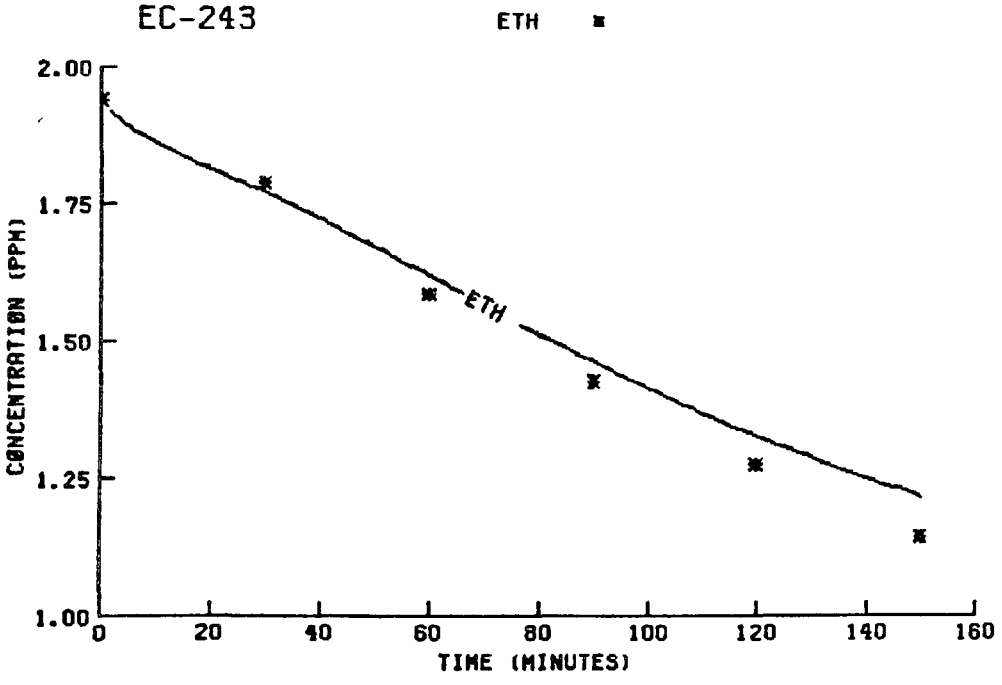

EC-243
NØ2 ×
NØ +
Ø3 ✱
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
Ø3
NØ2
NØ
0
20
40
60
80
100
120
140
160
TIME (MINUTES)

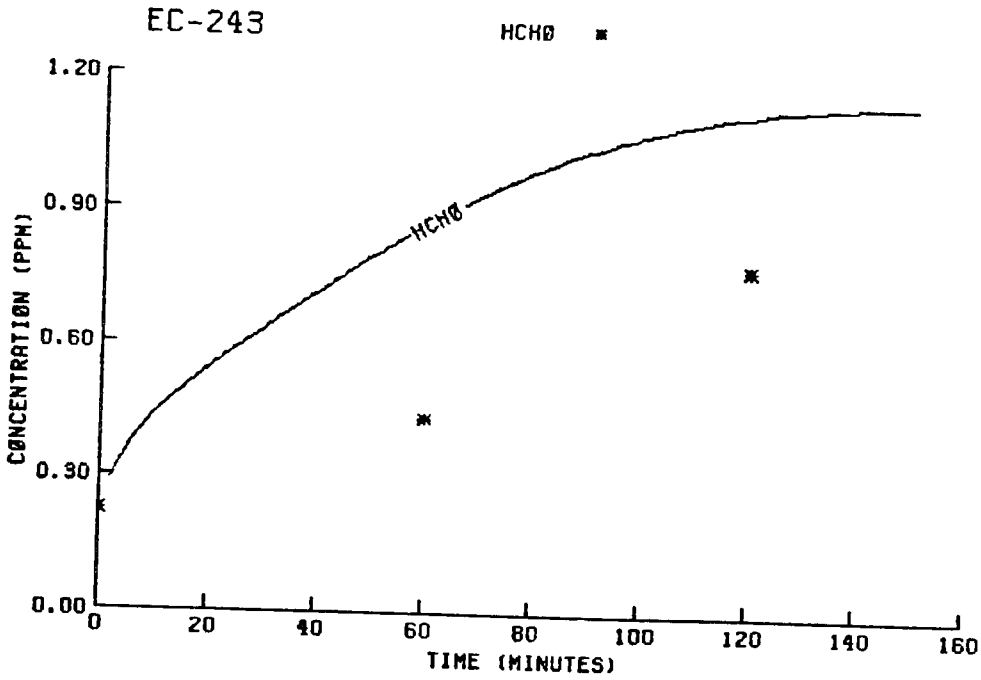

EC-243
PAN ■
0.12
0.09
0.06
0.03
0.00
CØNCENTRATIØN (PPM)
PAN
0
20
40
60
80
100
120
140
160
TIME (MINUTES)

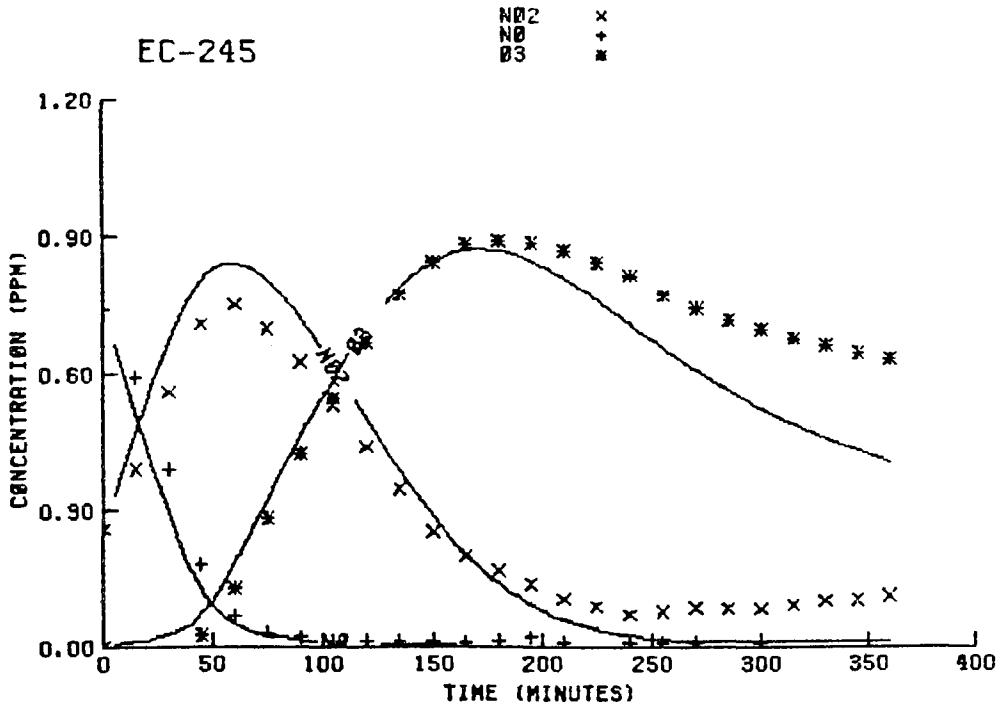

EC-243
0LE
0.12
0.09
0.06
0.03
0.00
CONCENTRATION (PPM)
0LE
0
20
40
60
80
100
120
140
160
TIME (MINUTES)

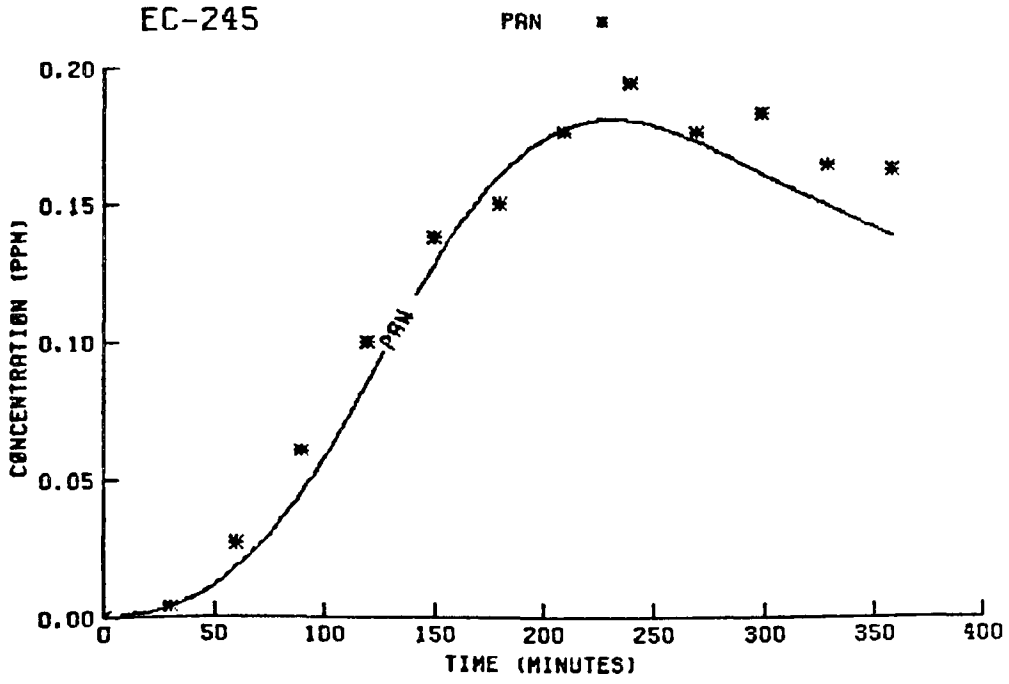

EC-243
PAR
3.60
3.30
3.00
2.70
2.40
CONCENTRATION (PPM)
PAR
0
20
40
60
80
100
120
140
160
TIME (MINUTES)

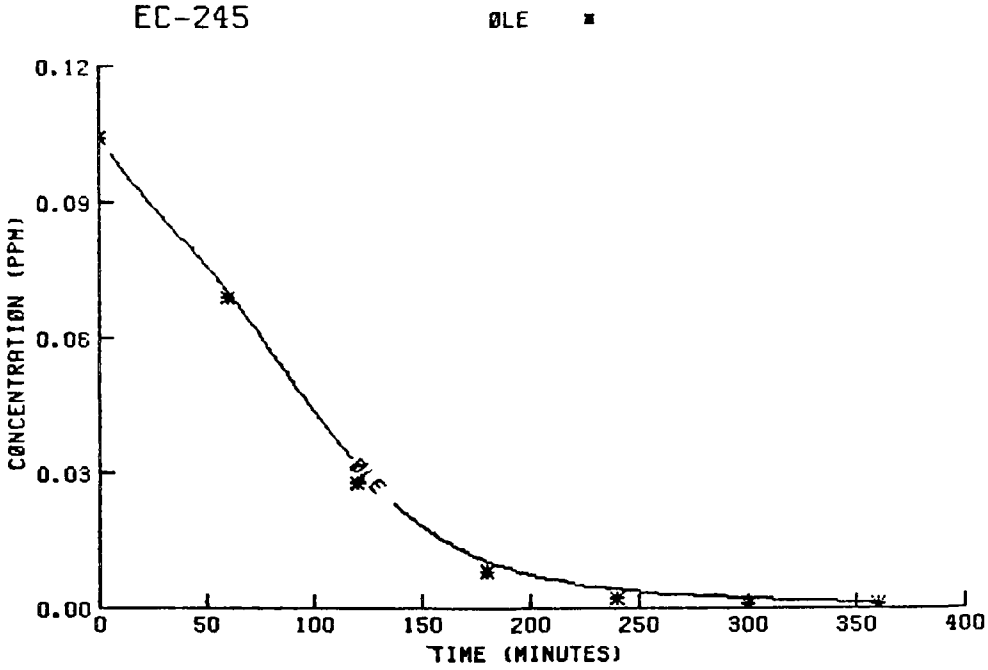

EC-243
ARØ
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPH)
ARØ
0
20
40
60
80
100
120
140
160
TIME (MINUTES)

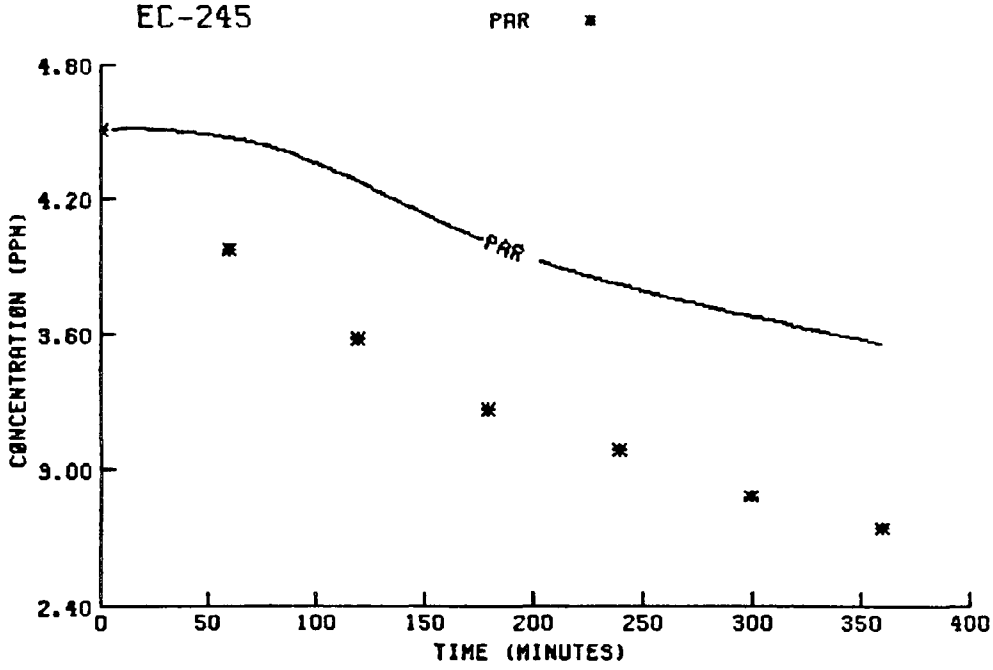

EC-243
ETH
2.00
1.75
1.50
1.25
1.00
CØNCENTRATIØN (PPH)
ETH
0
20
40
60
80
100
120
140
160
TIME (MINUTES)

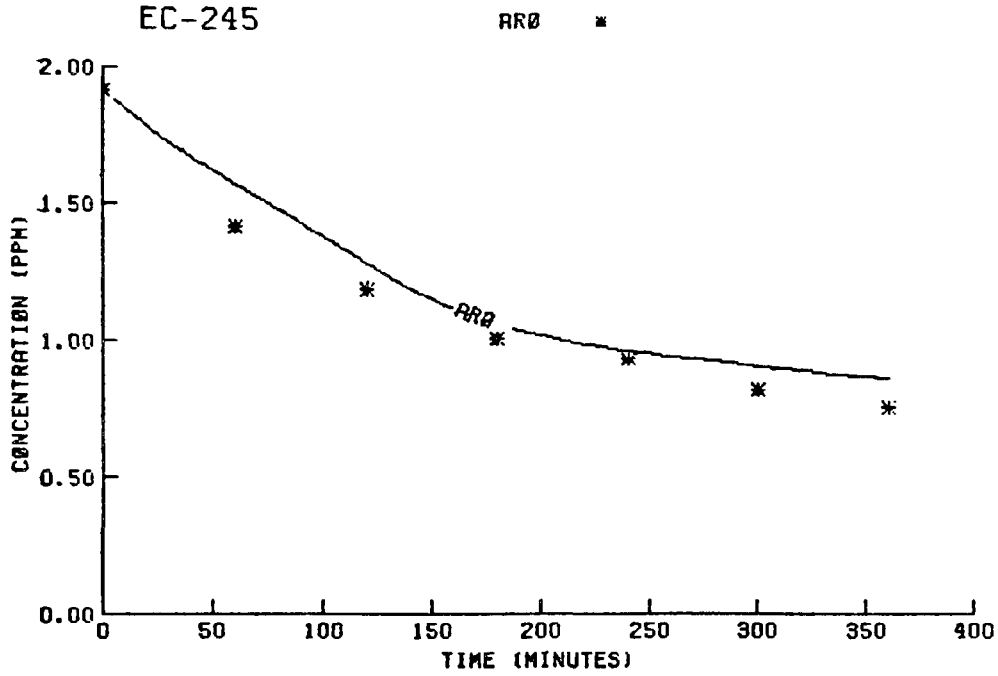

EC-243
HCHØ
1.20
0.90
0.60
0.30
0.00
CØNCENTRATIØN (PPM)
HCHØ
0
20
40
60
80
100
120
140
160
TIME (MINUTES)

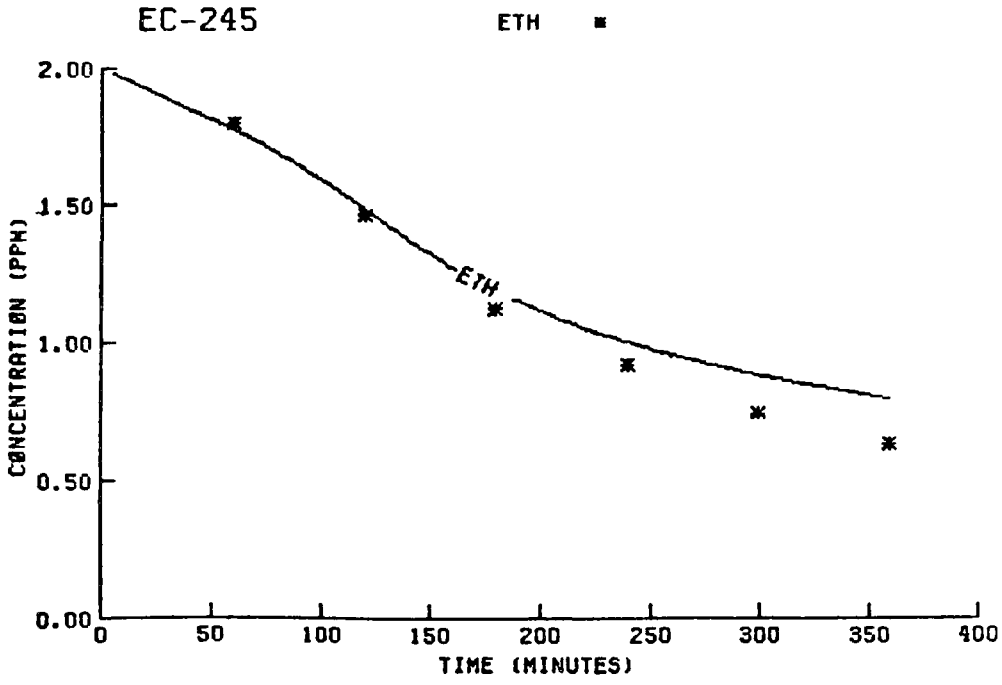

EC-245
NØ2
NØ
Ø3
1.20
0.90
0.60
0.90
0.00
CØNCENTRATIØN (PPM)
NØ2
Ø3
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

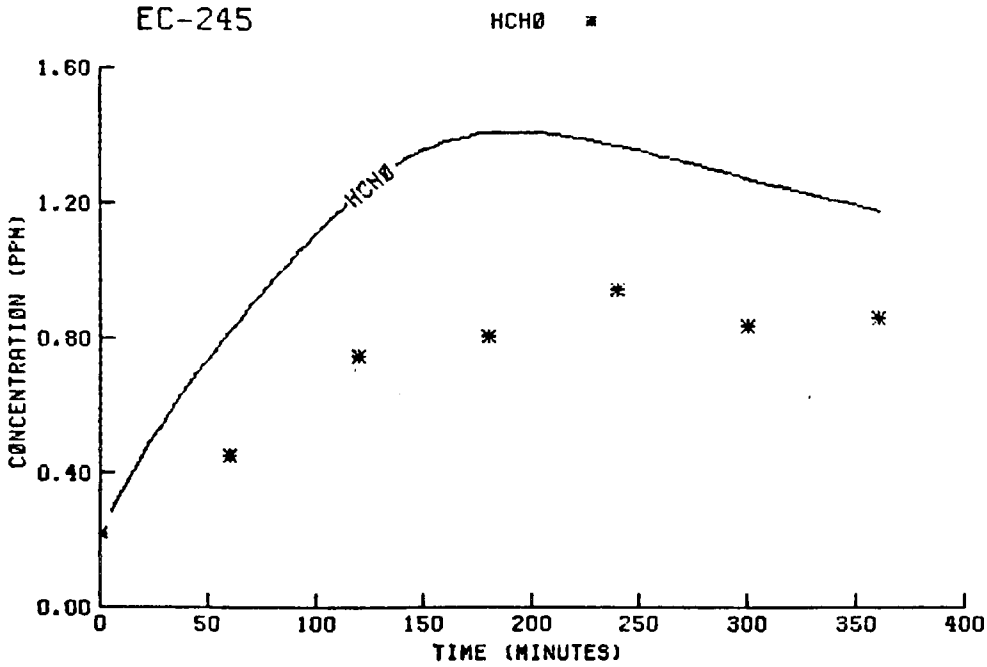

EC-245
PAN
0.20
0.15
0.10
0.05
0.00
CØNCENTRATIØN (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

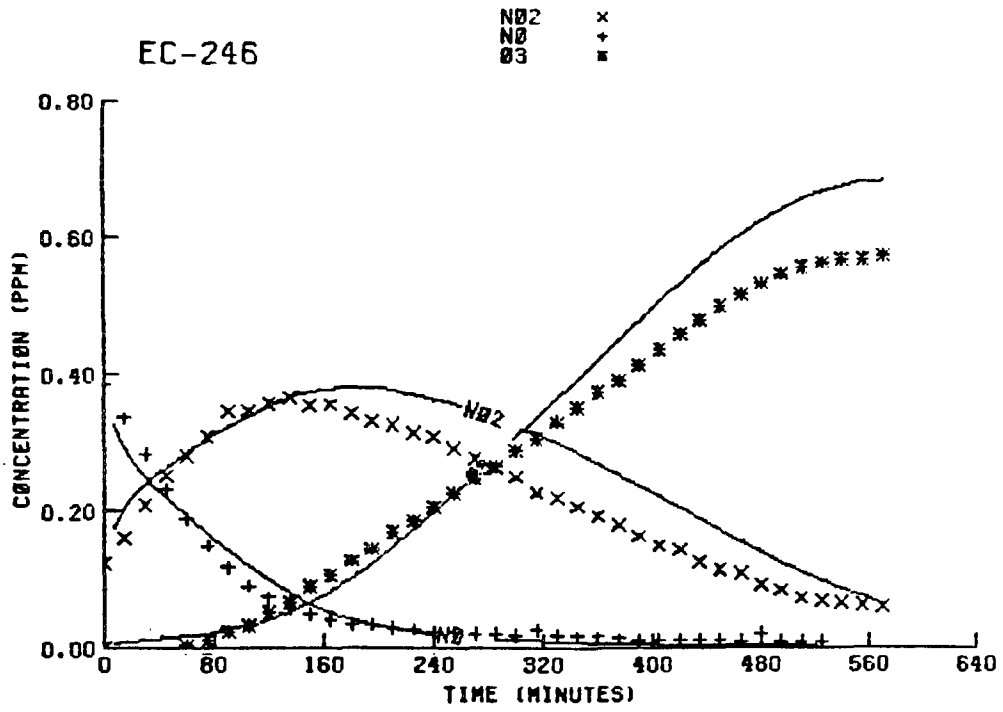

EC-245
ØLE
0.12
0.09
0.06
0.03
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
ØLE

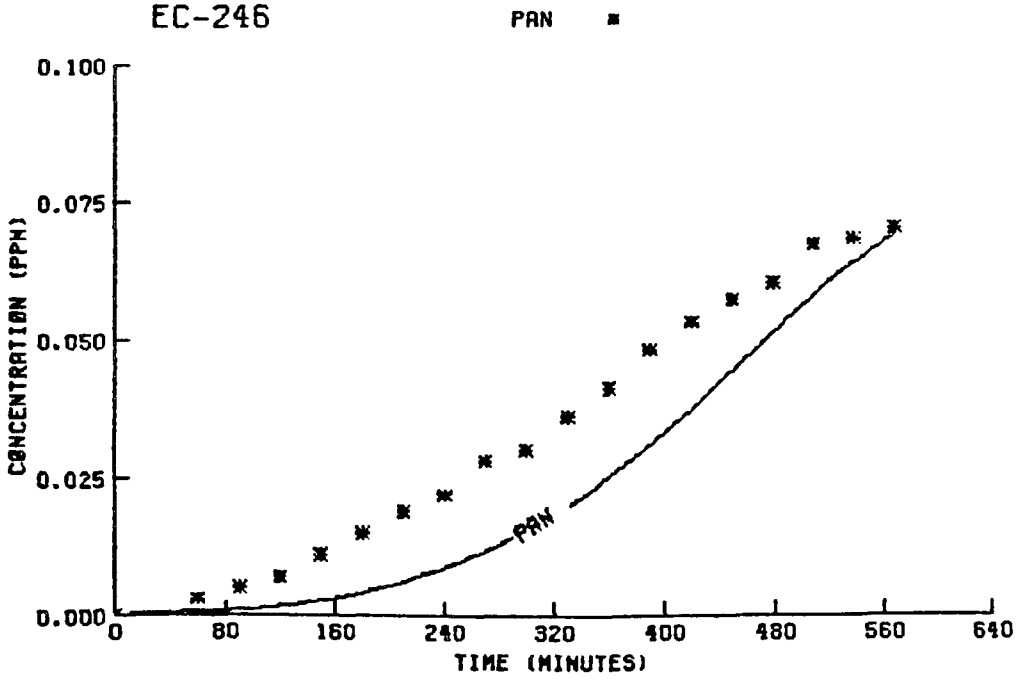

EC-245
PAR
4.80
4.20
3.60
9.00
2.40
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
PAR

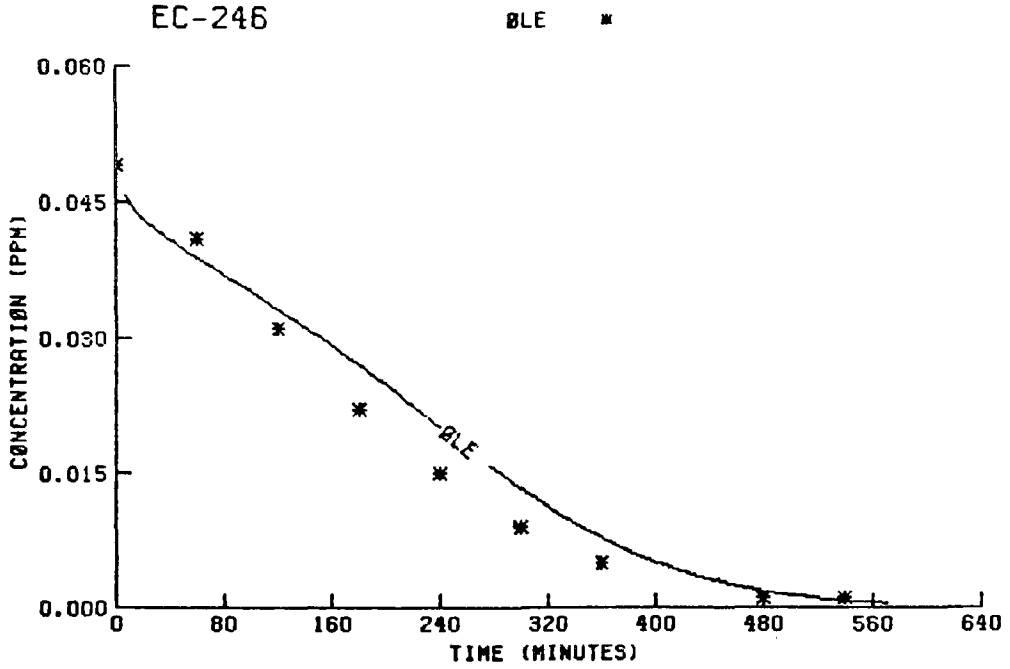

EC-245
ARØ
2.00
1.50
1.00
0.50
0.00
CØNCENTRATIØN (PPM)
ARØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

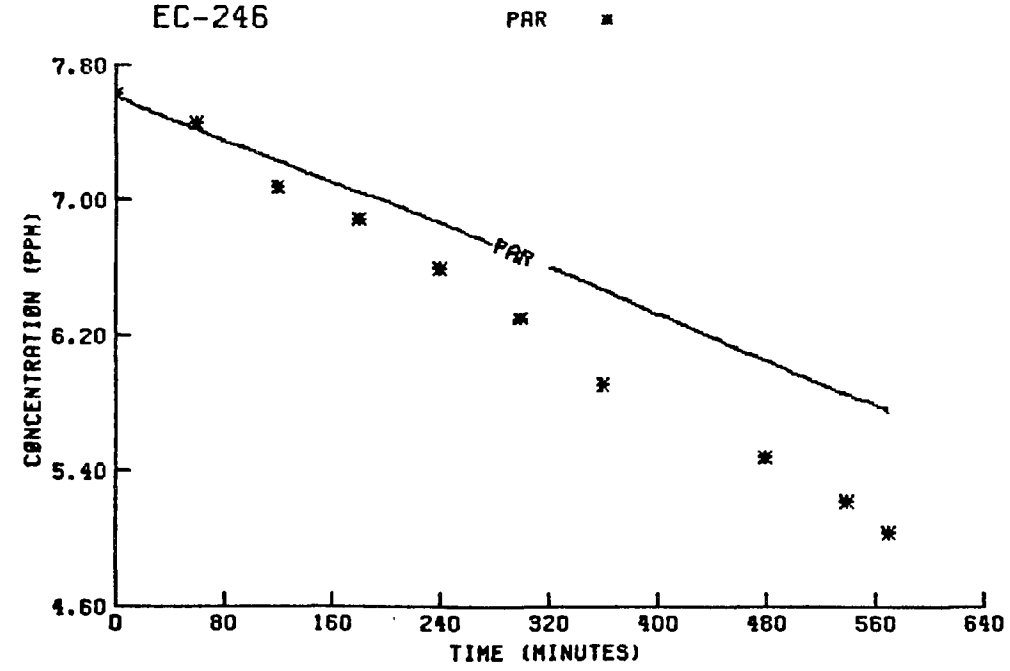

EC-245
ETH
2.00
1.50
1.00
0.50
0.00
CØNCENTRATIØN (PPM)
ETH
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

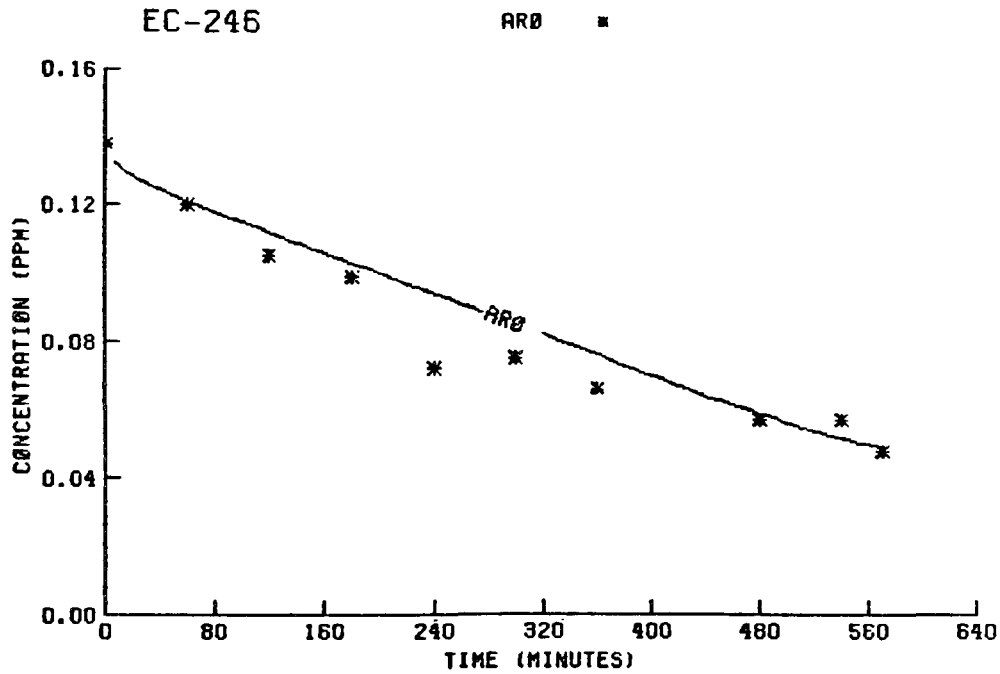

EC-245
HCHØ
1.60
1.20
0.80
0.40
0.00
CØNCENTRATIØN (PPM)
HCHØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

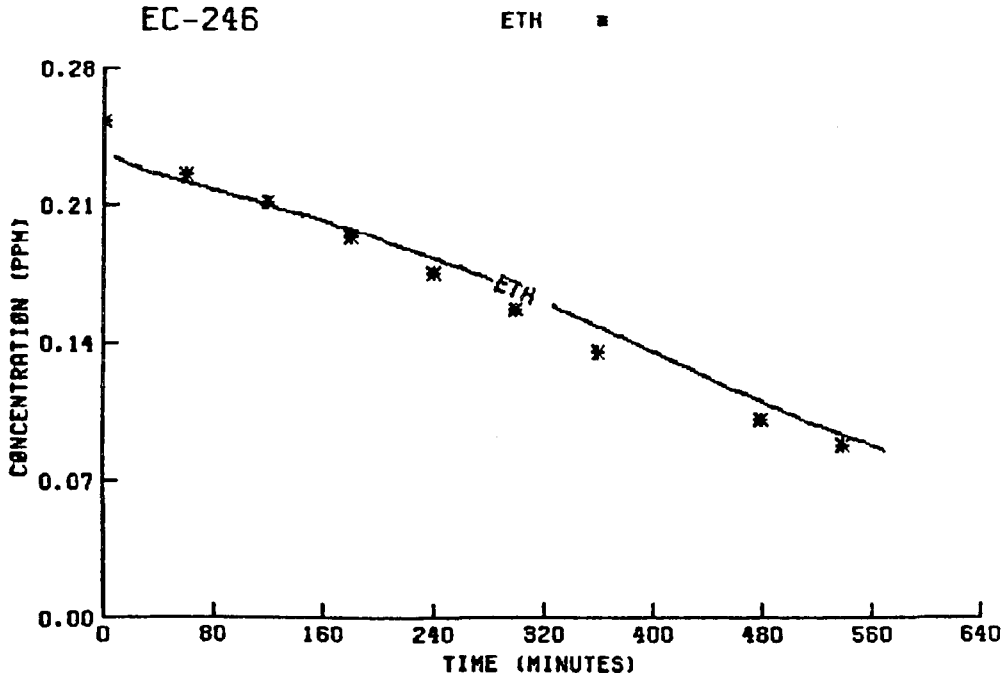

EC-246
NØ2 ×
NØ +
Ø3 *
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

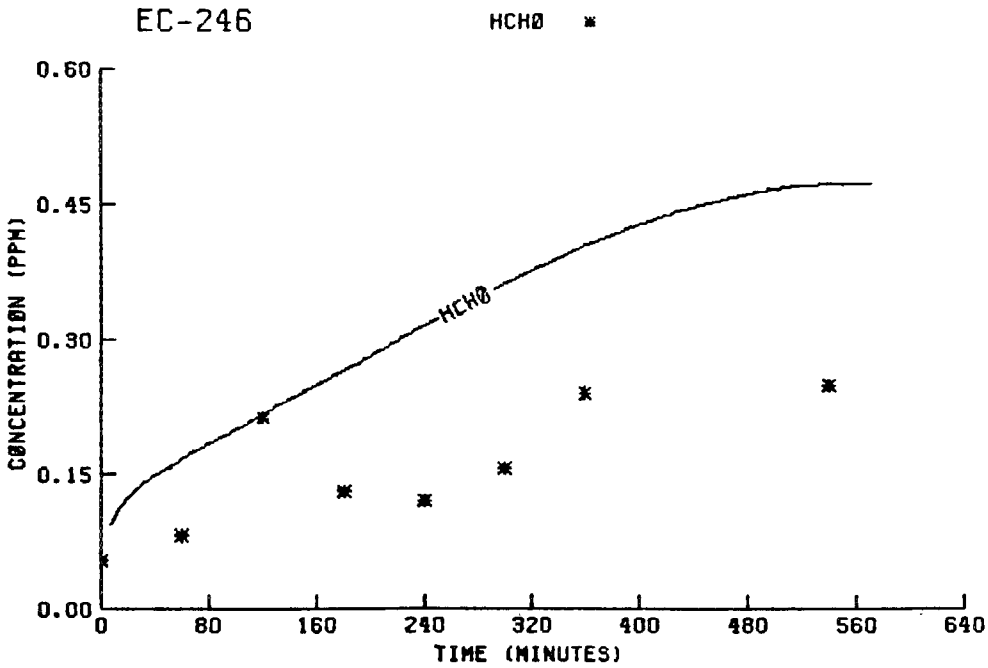

EC-246
PAN *
0.100
0.075
0.050
0.025
0.000
CØNCENTRATIØN (PPM)
PAN
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

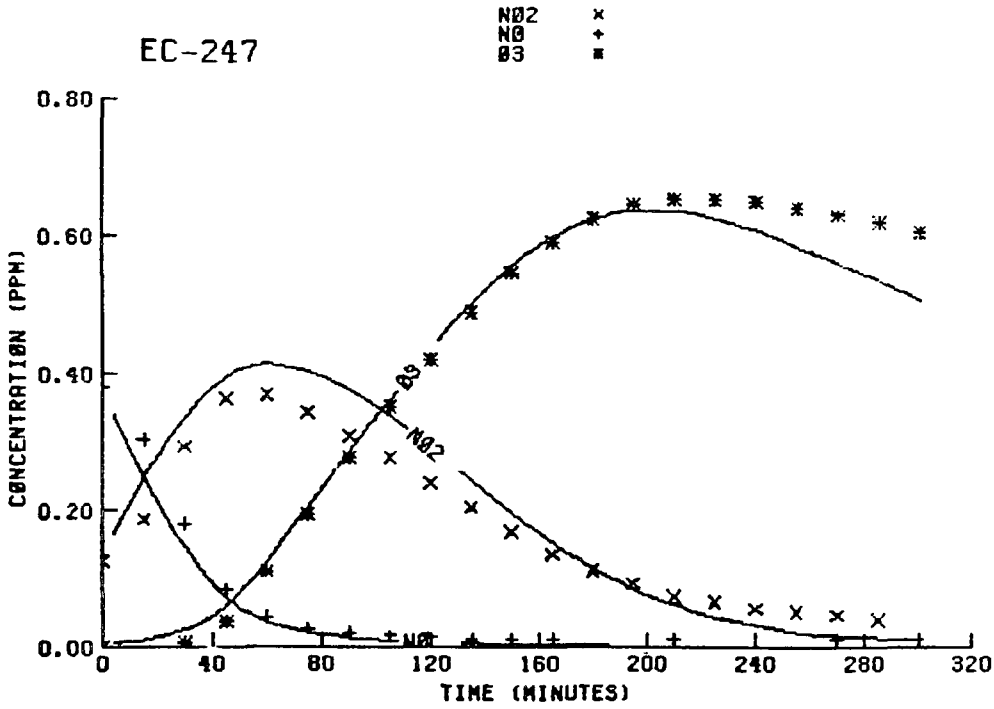

EC-246
BLE
0.060
0.045
0.030
0.015
0.000
CONCENTRATION (PPM)
BLE
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

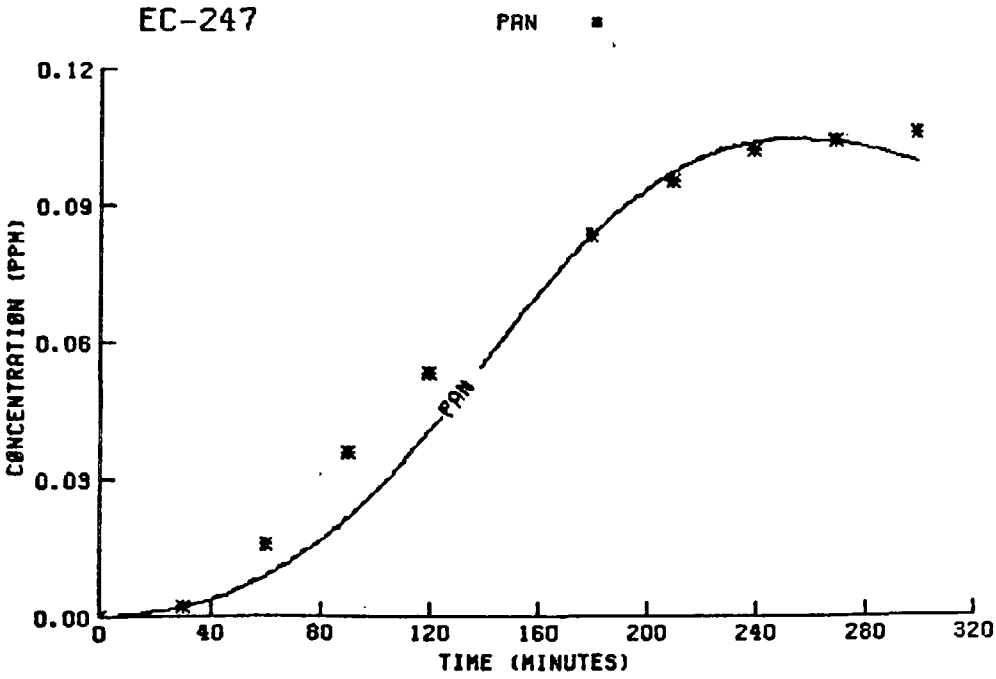

EC-246
PAR
7.80
7.00
6.20
5.40
4.60
CONCENTRATION (PPM)
PAR
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

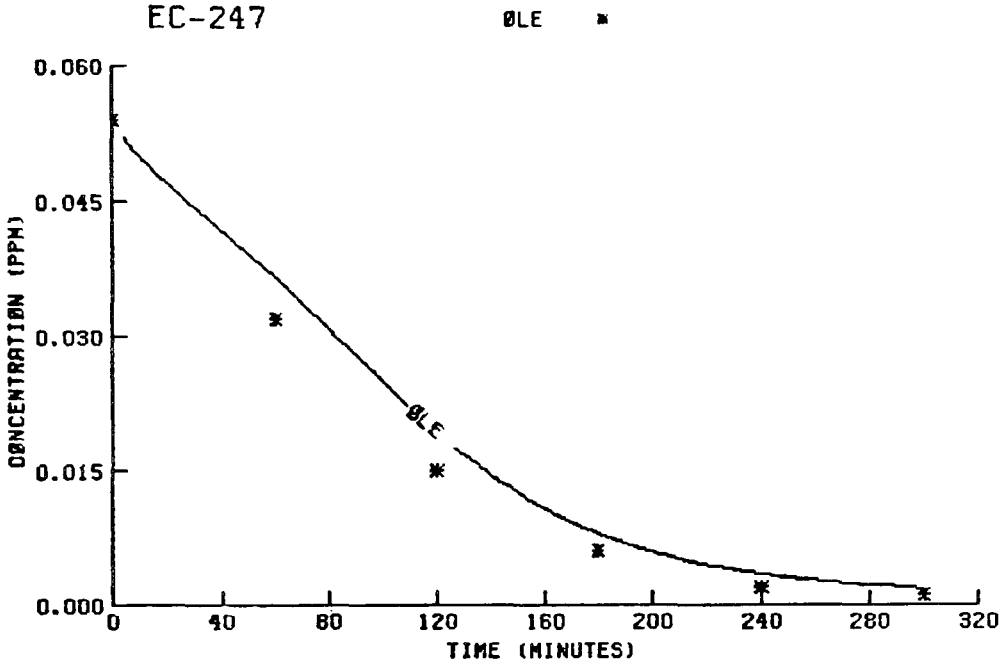

EC-246
ARØ
0.16
0.12
0.08
0.04
0.00
CØNCENTRATIØN (PPM)
ARØ
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

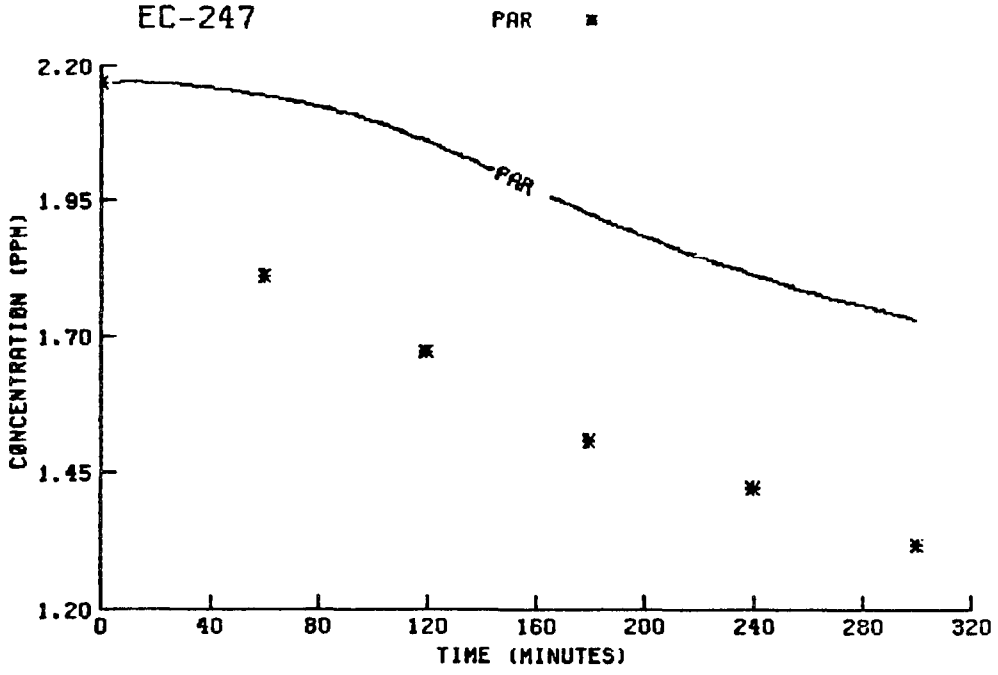

EC-246
ETH
0.28
0.21
0.14
0.07
0.00
CØNCENTRATIØN (PPM)
ETH
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

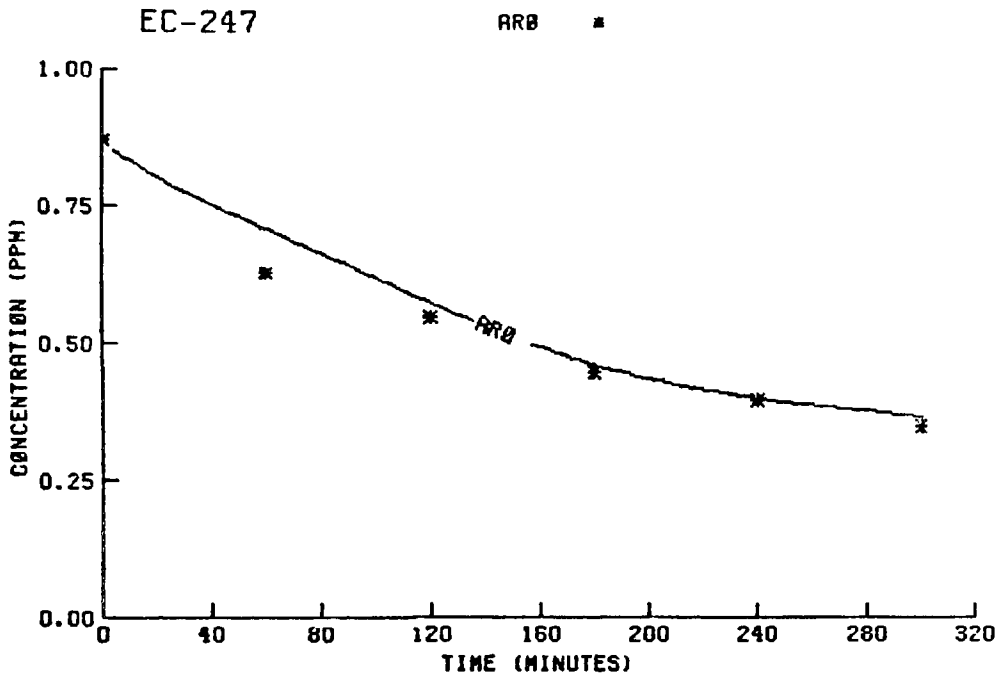

EC-246
HCHØ
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
HCHØ
0
80
160
240
320
400
480
560
640
TIME (MINUTES)

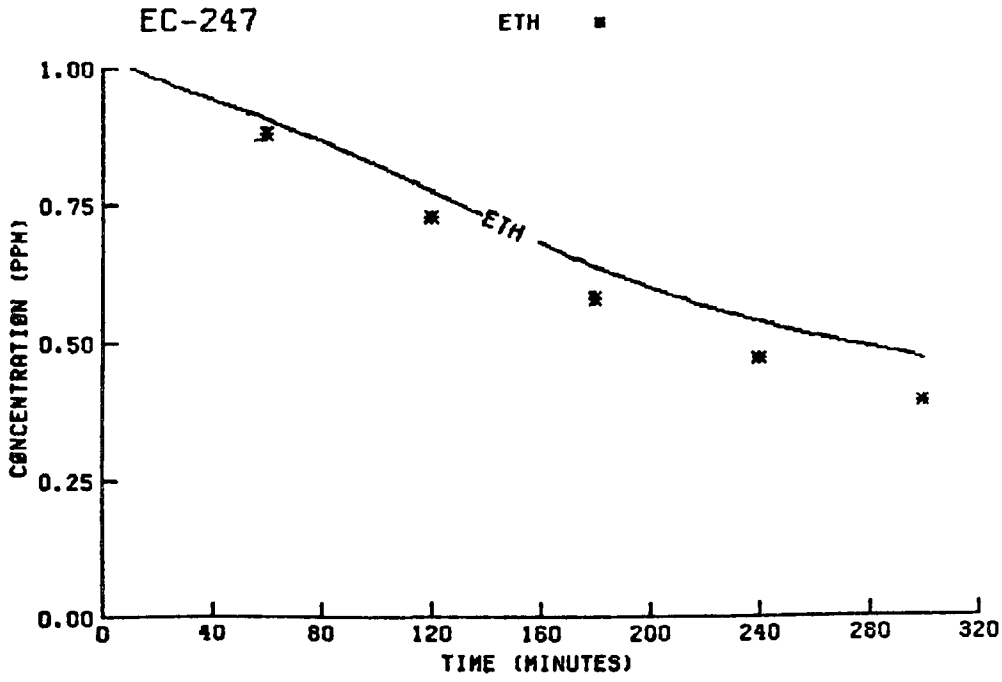

EC-247
NØ2
NØ
Ø3
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
Ø3
NØ2
NØ
0
40
80
120
160
200
240
280
320
TIME (MINUTES)

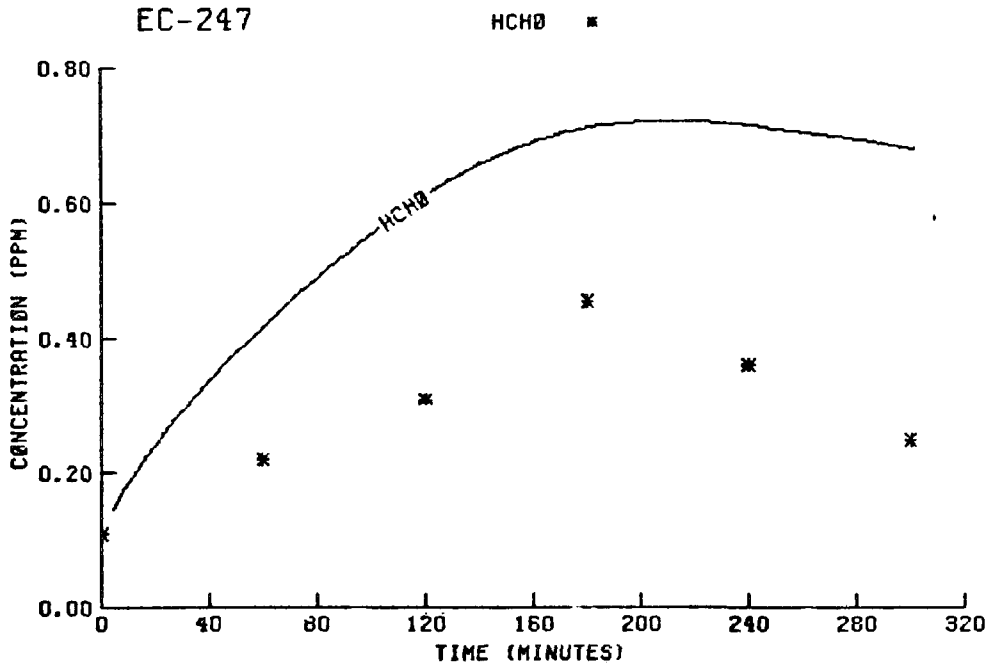

EC-247
PAN
0.12
0.09
0.06
0.03
0.00
CØNCENTRATIØN (PPM)
PAN
0
40
80
120
160
200
240
280
320
TIME (MINUTES)


EC-247
ØLE
0.060
0.045
0.030
0.015
0.000
CØNCENTRATIØN (PPM)
ØLE
0
40
80
120
160
200
240
280
320
TIME (MINUTES)


EC-247
PAR
2.20
1.95
1.70
1.45
1.20
CØNCENTRATIØN (PPM)
PAR
0
40
80
120
160
200
240
280
320
TIME (MINUTES)


EC-247
ARØ
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
ARØ
0
40
80
120
160
200
240
280
320
TIME (MINUTES)

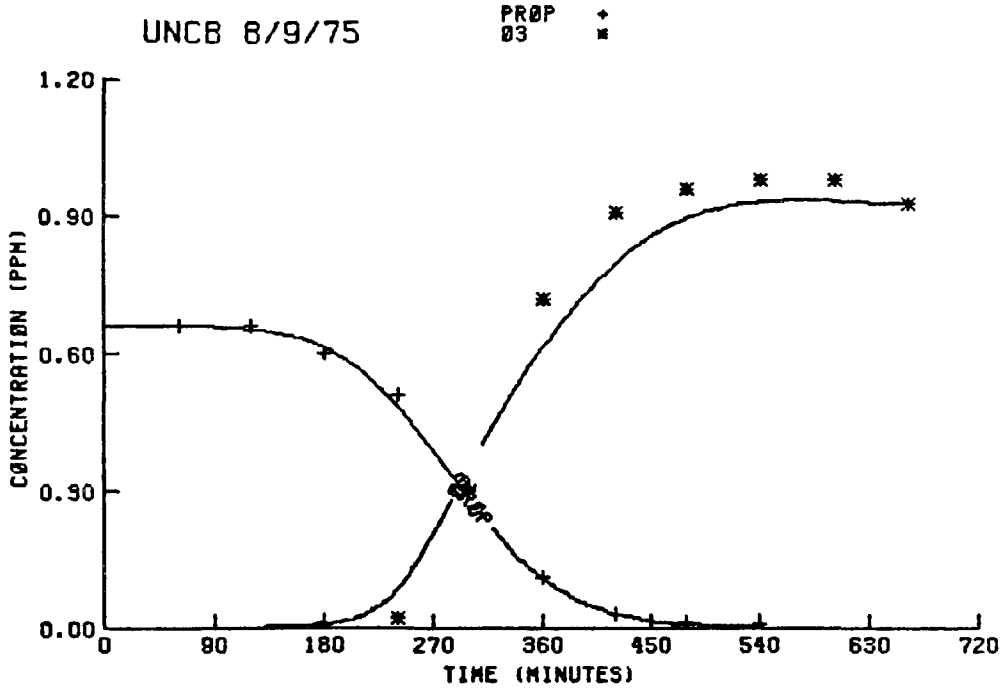

EC-247
ETH
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
ETH
0
40
80
120
160
200
240
280
320
TIME (MINUTES)

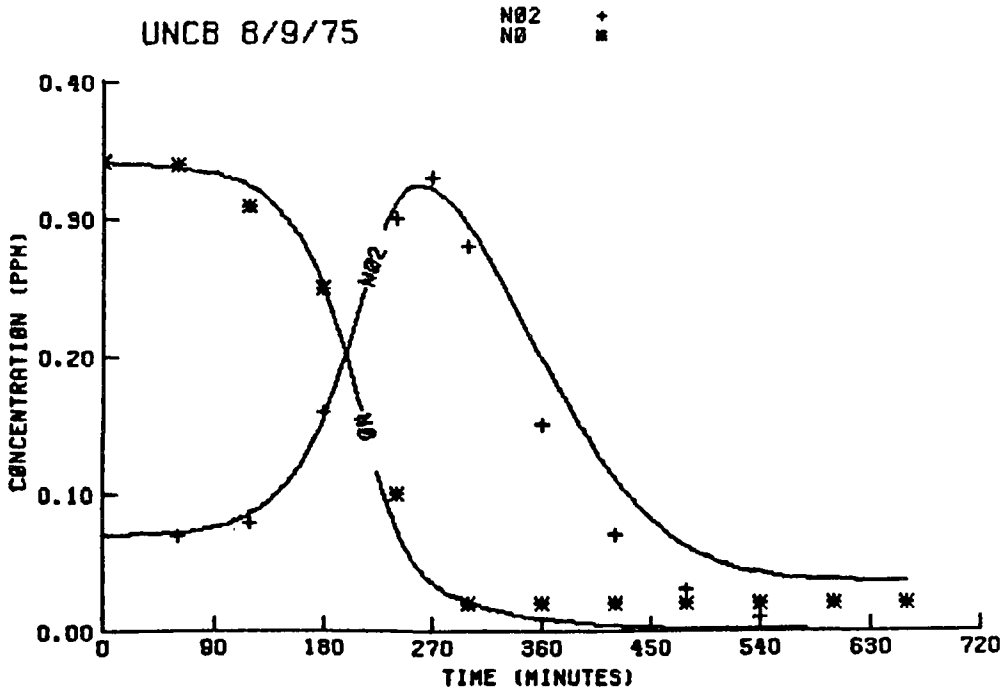

EC-247
HCHØ
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
HCHØ
0
40
80
120
160
200
240
280
320
TIME (MINUTES)

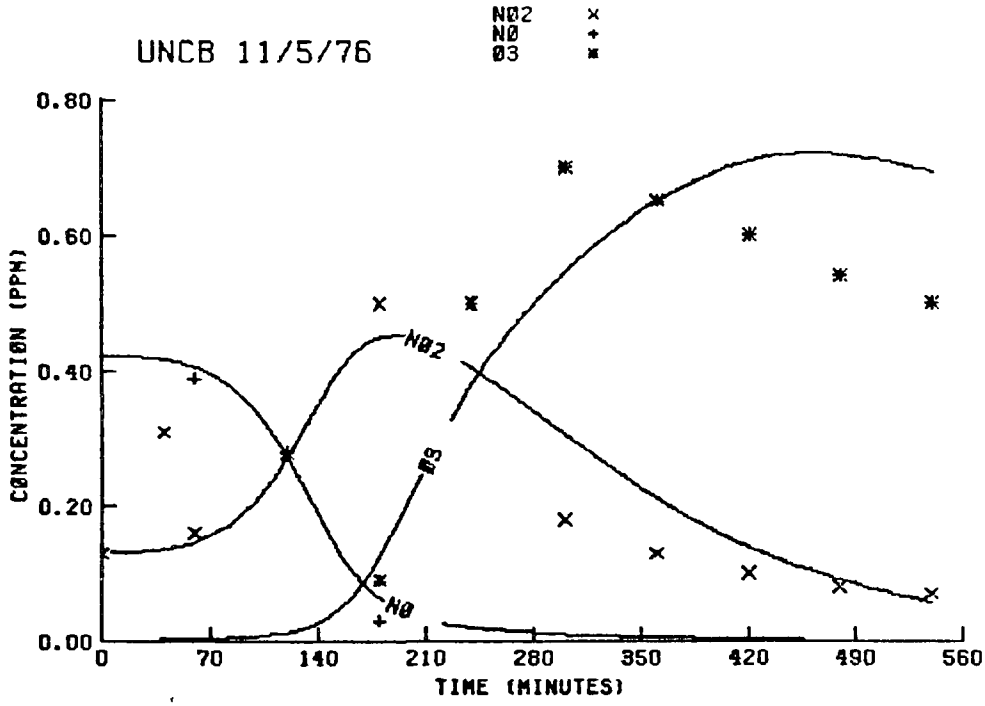
Part C

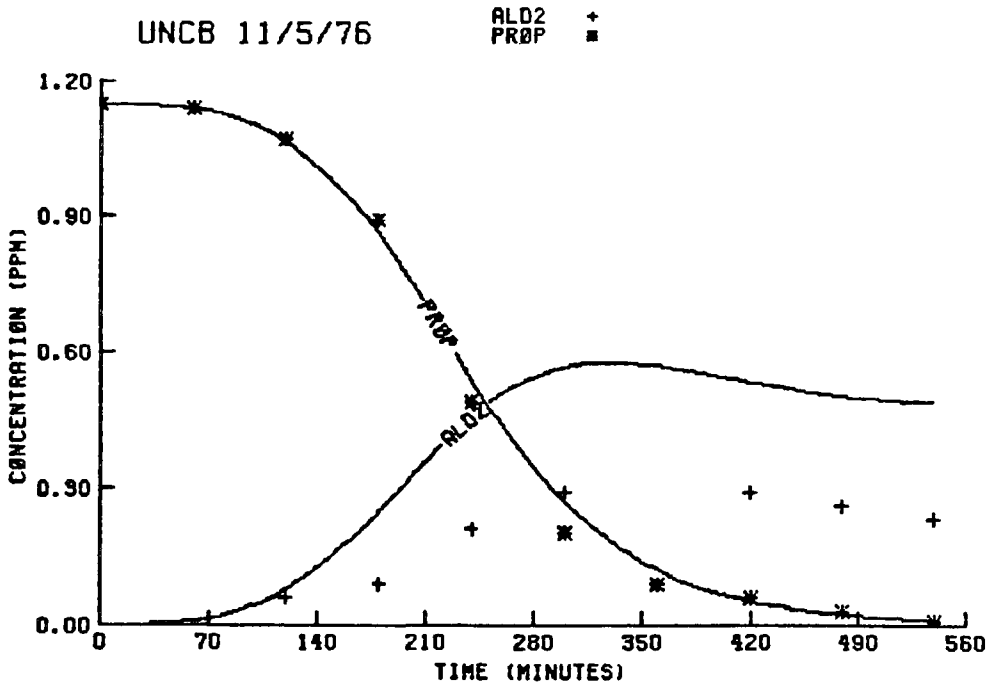
Simulation Results of Propylene Experiments Performed at Various Chambers

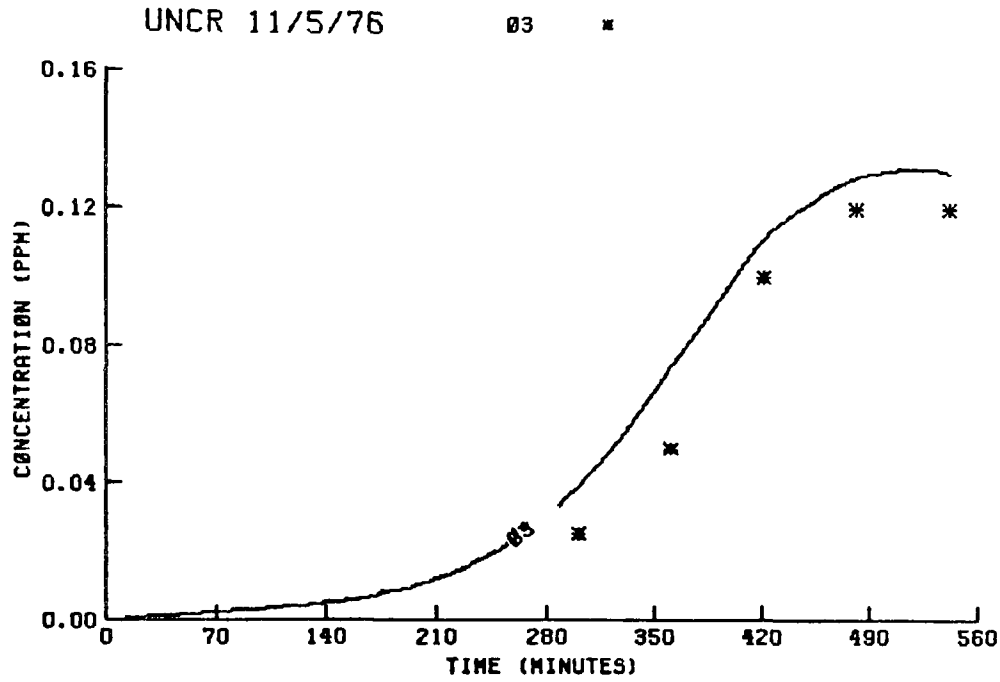
UNC CHAMBER EXPERIMENTS

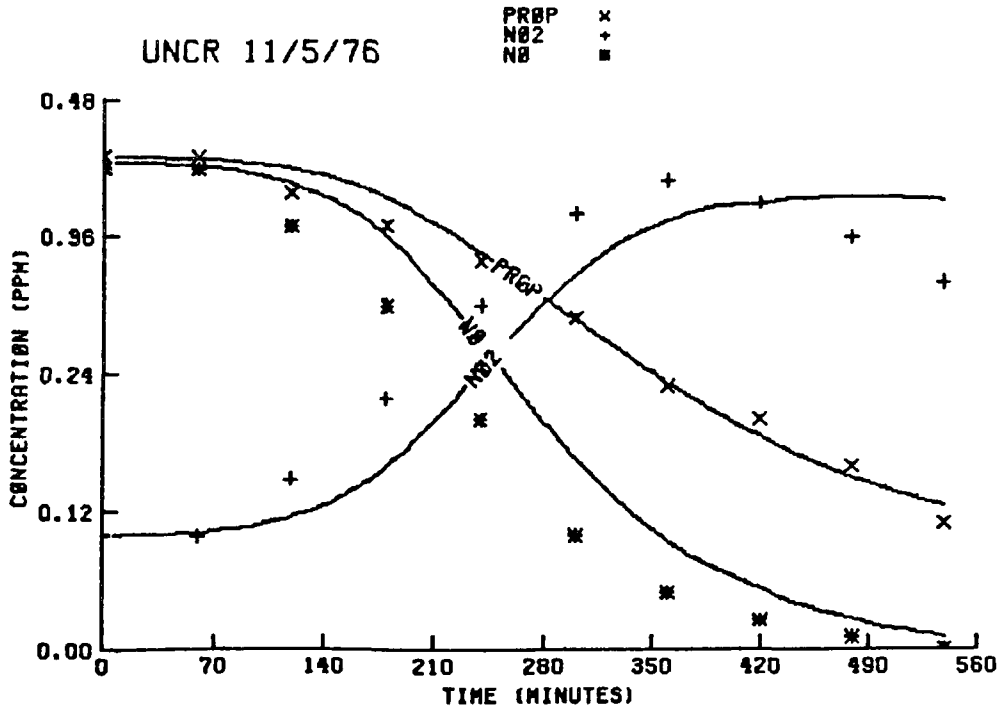

UNCB 8/9/75
PROP +
03 *
1.20
0.90
0.60
0.30
0.00
CONCENTRATION (PPM)
0
90
180
270
360
450
540
630
720
TIME (MINUTES)
PROP
O3

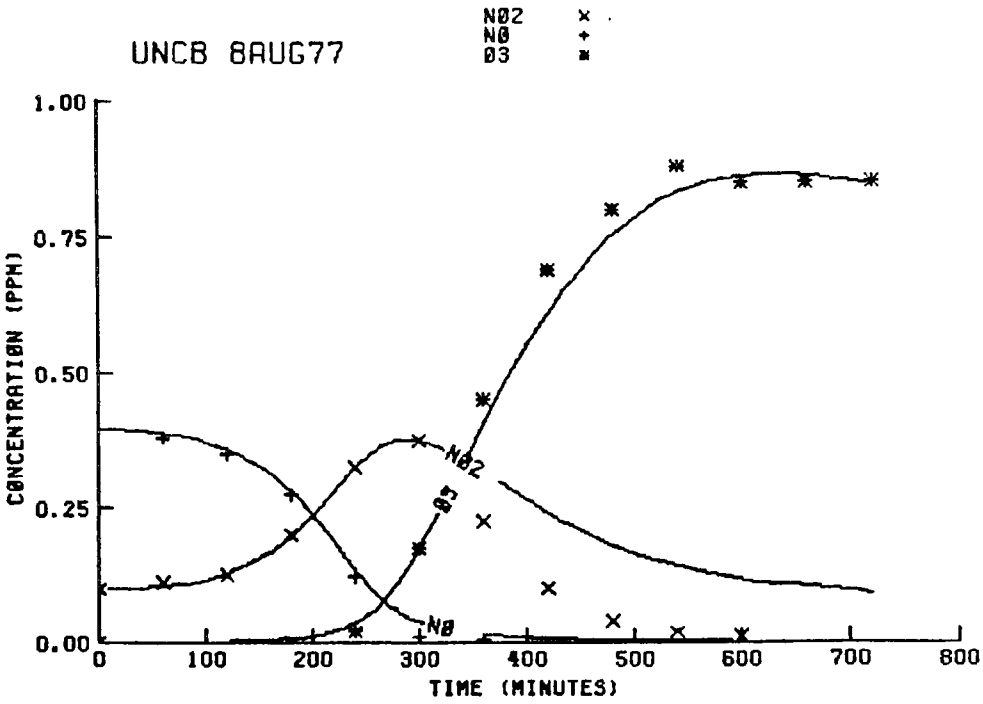

UNCB 8/9/75
NO2 +
NO *
0.40
0.30
0.20
0.10
0.00
CONCENTRATION (PPM)
0
90
180
270
360
450
540
630
720
TIME (MINUTES)
NO2
NO

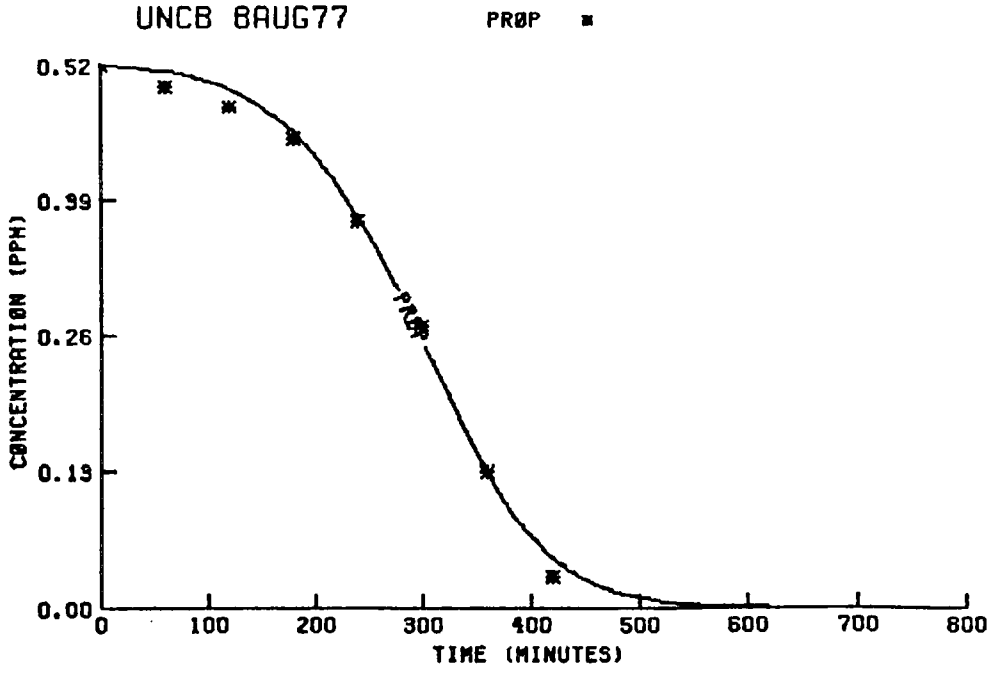

UNCB 11/5/76
NØ2
NØ
Ø3
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
NØ2
Ø3
NØ
0
70
140
210
280
350
420
490
560
TIME (MINUTES)

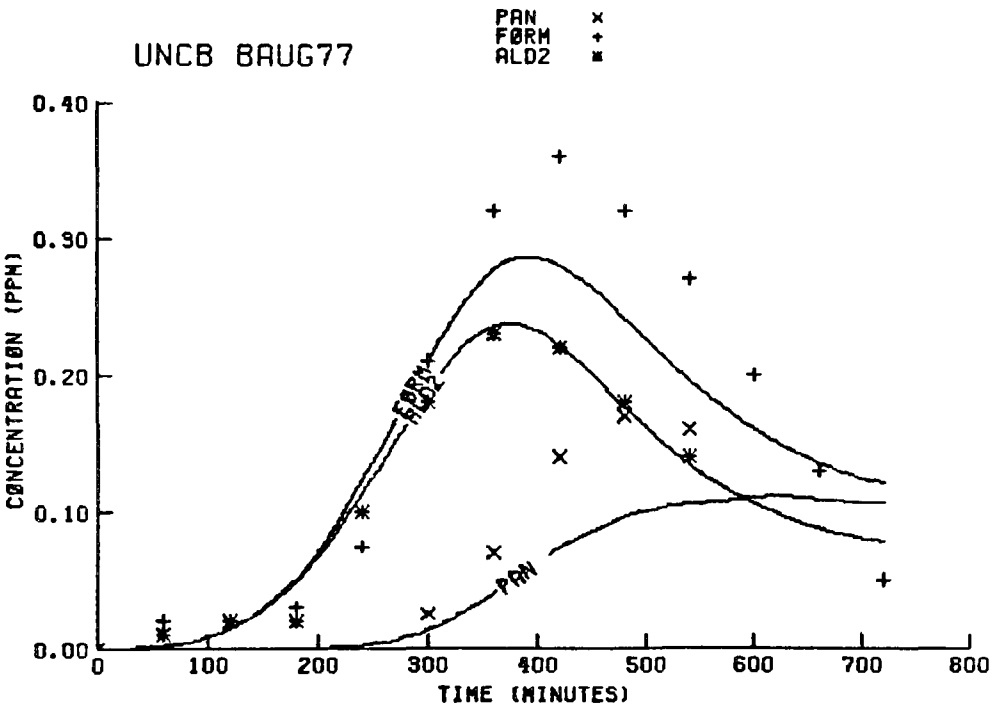

UNCB 11/5/76
ALD2
PRØP
1.20
0.90
0.60
0.90
0.00
CØNCENTRATIØN (PPM)
PRØP
ALD2
0
70
140
210
280
350
420
490
560
TIME (MINUTES)


UNCR 11/5/76
03
0.16
0.12
0.08
0.04
0.00
CONCENTRATION (PPM)
0
70
140
210
280
350
420
490
560
TIME (MINUTES)

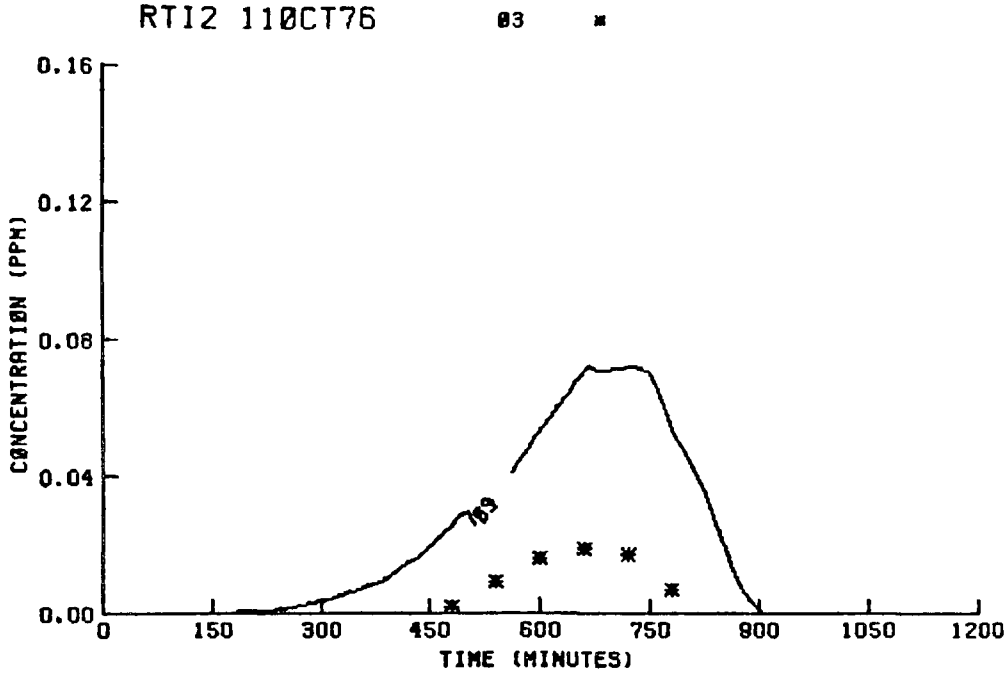

PROP
NO2
NO
UNCR 11/5/76
0.48
0.36
0.24
0.12
0.00
CONCENTRATION (PPM)
PROP
NO
NO2
0
70
140
210
280
350
420
490
560
TIME (MINUTES)

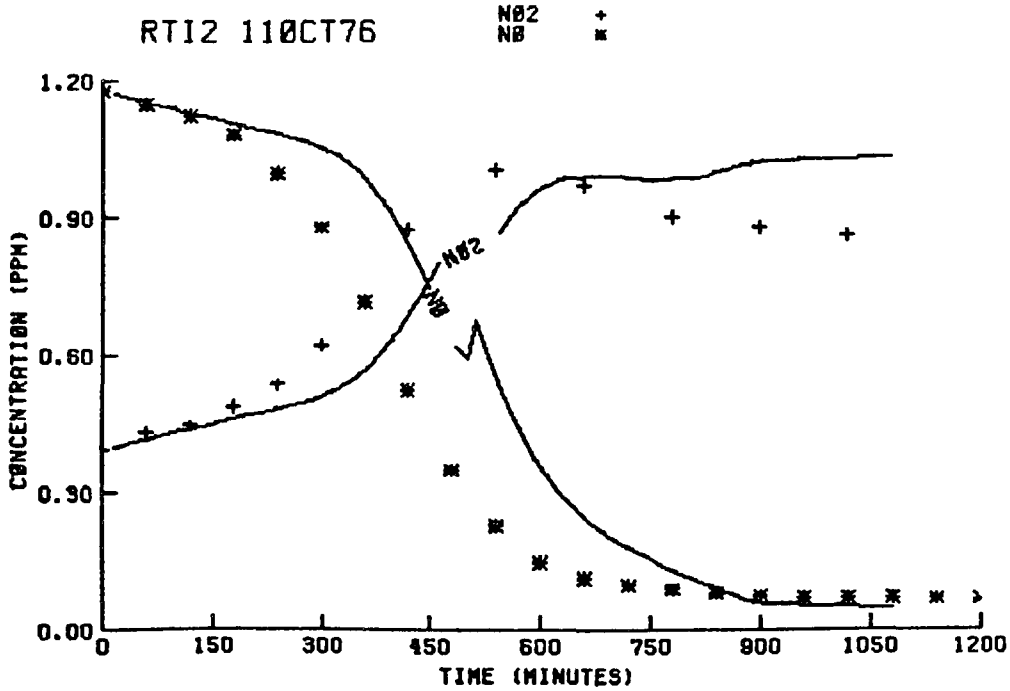

UNCB 8AUG77
NØ2
NØ
Ø3
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
0
100
200
300
400
500
600
700
800
TIME (MINUTES)

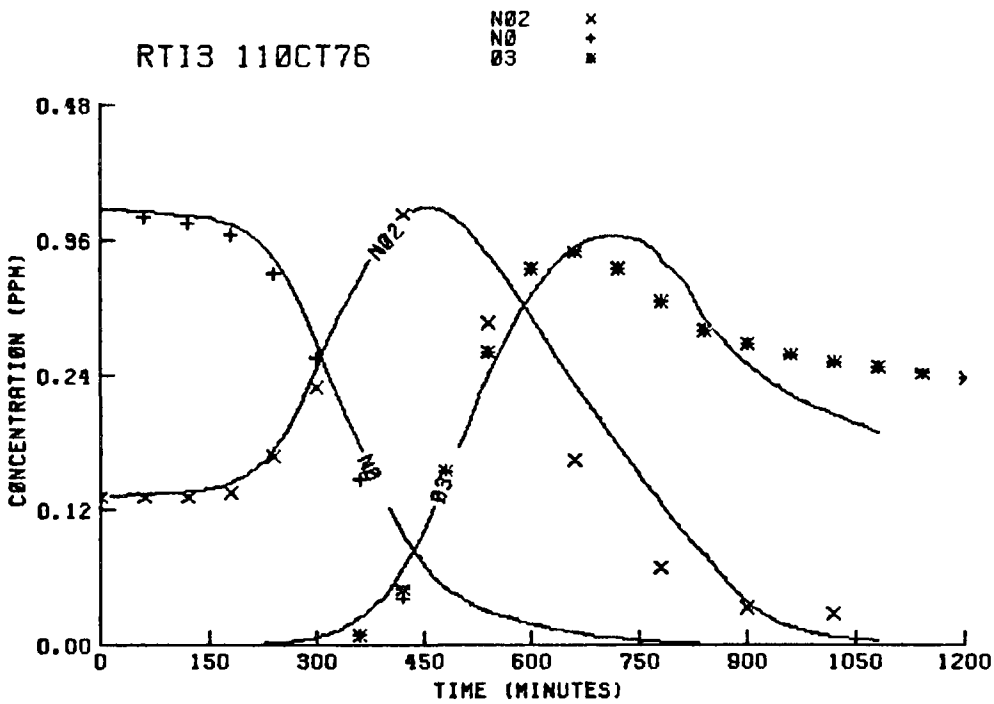

UNCB 8AUG77
PRØP
0.52
0.39
0.26
0.13
0.00
CØNCENTRATIØN (PPM)
0
100
200
300
400
500
600
700
800
TIME (MINUTES)

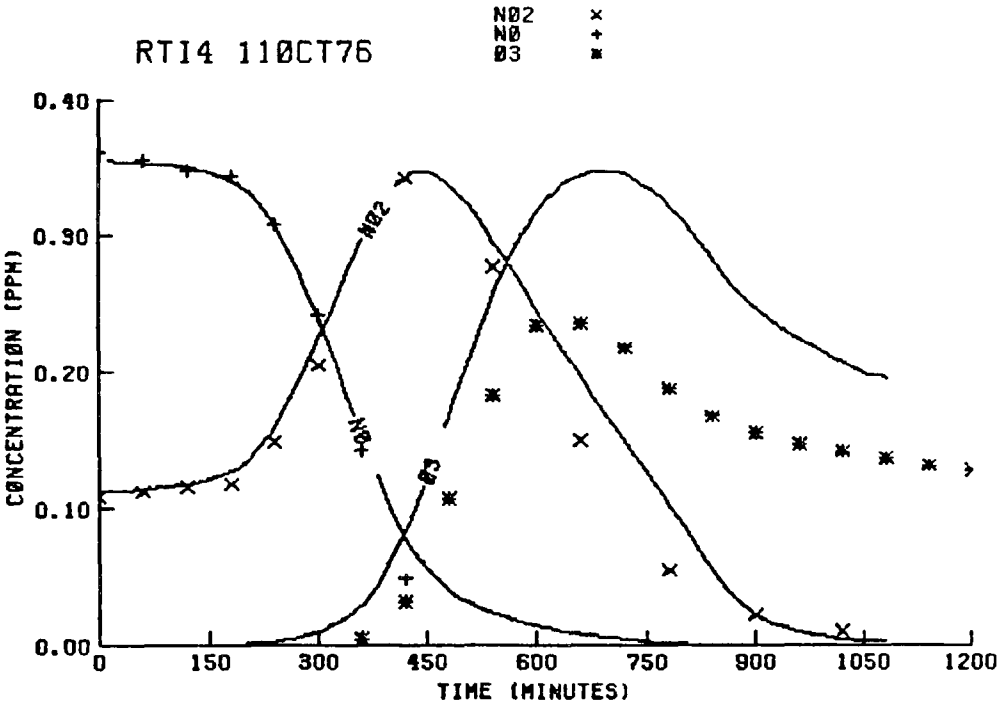

UNCB BAUG77
PAN
FORM
ALD2
CONCENTRATION (PPM)
0.40
0.30
0.20
0.10
0.00
0
100
200
300
400
500
600
700
800
TIME (MINUTES)
FORM
ALD2
PAN

RTI CHAMBER EXPERIMENTS

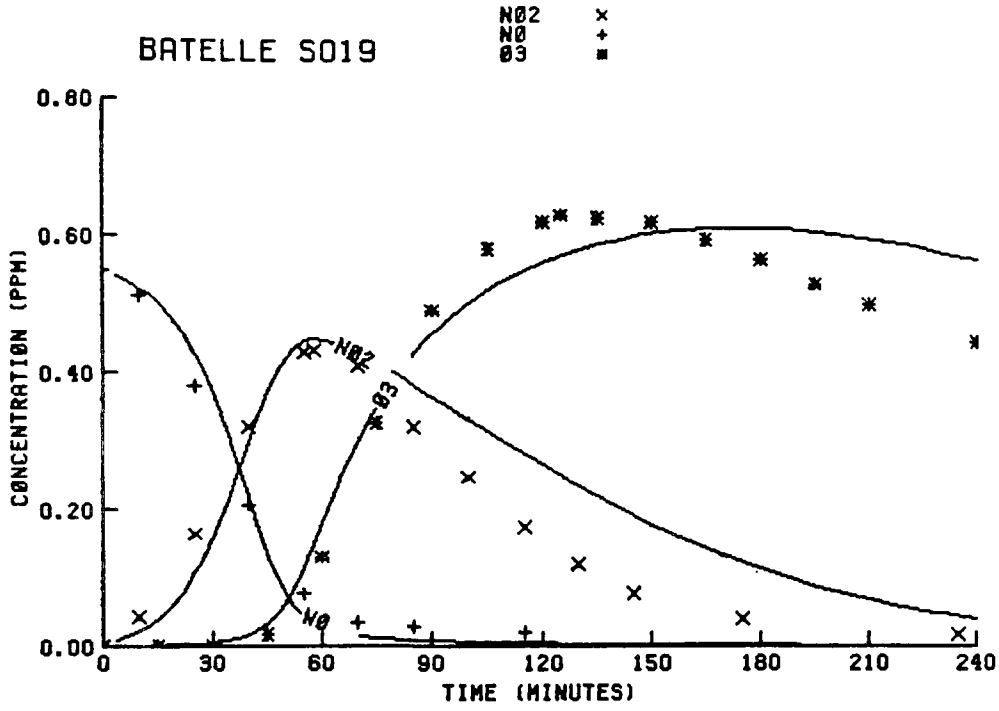

RTI2 110CT76
03
0.16
0.12
0.08
0.04
0.00
CONCENTRATION (PPM)
03
0
150
300
450
600
750
900
1050
1200
TIME (MINUTES)

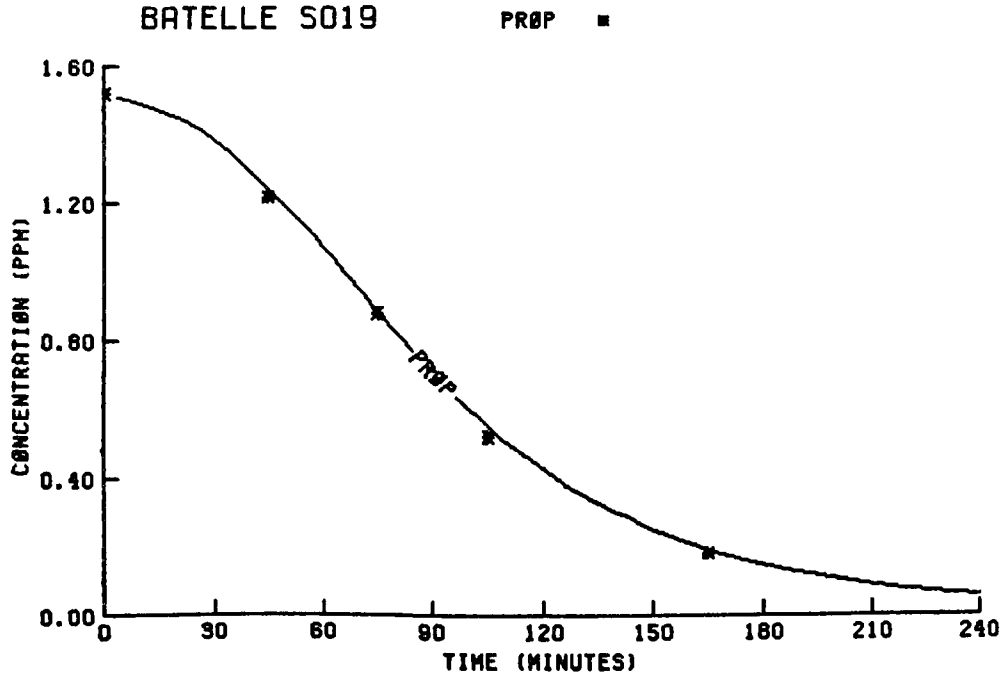

RTI2 110CT76
N02
NO
1.20
0.90
0.60
0.30
0.00
CONCENTRATION (PPM)
NO2
NO
0
150
300
450
600
750
900
1050
1200
TIME (MINUTES)

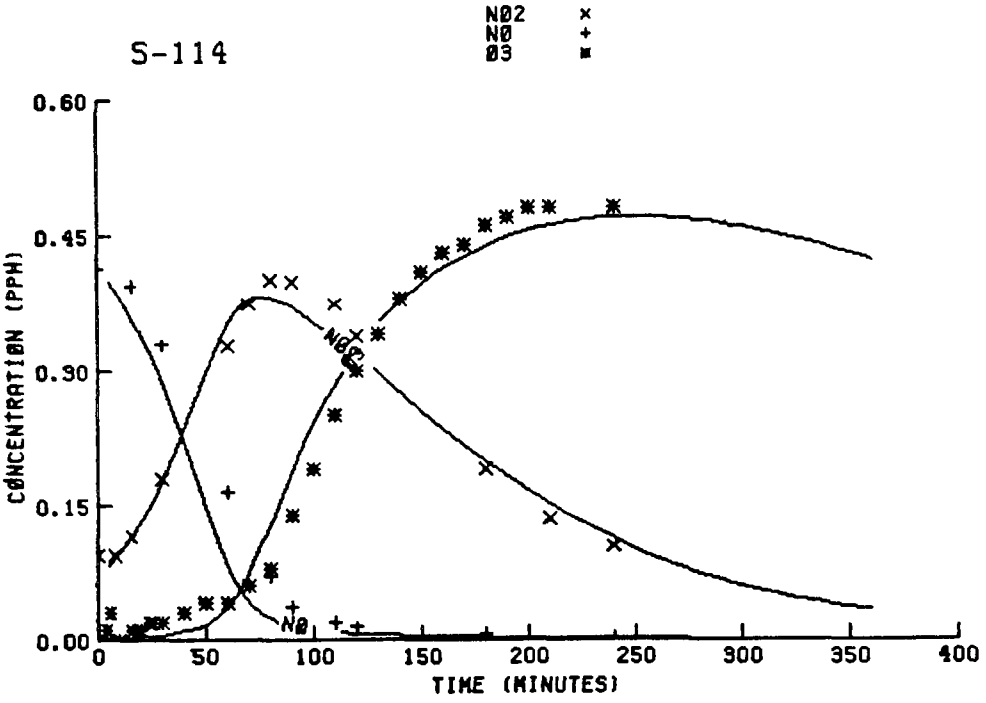

RT13 110CT76
NØ2 ×
NØ +
Ø3 *
0.48
0.96
0.24
0.12
0.00
CØNCENTRATIØN (PPH)
0
150
300
450
600
750
900
1050
1200
TIME (MINUTES)
NØ2
NØ
Ø3

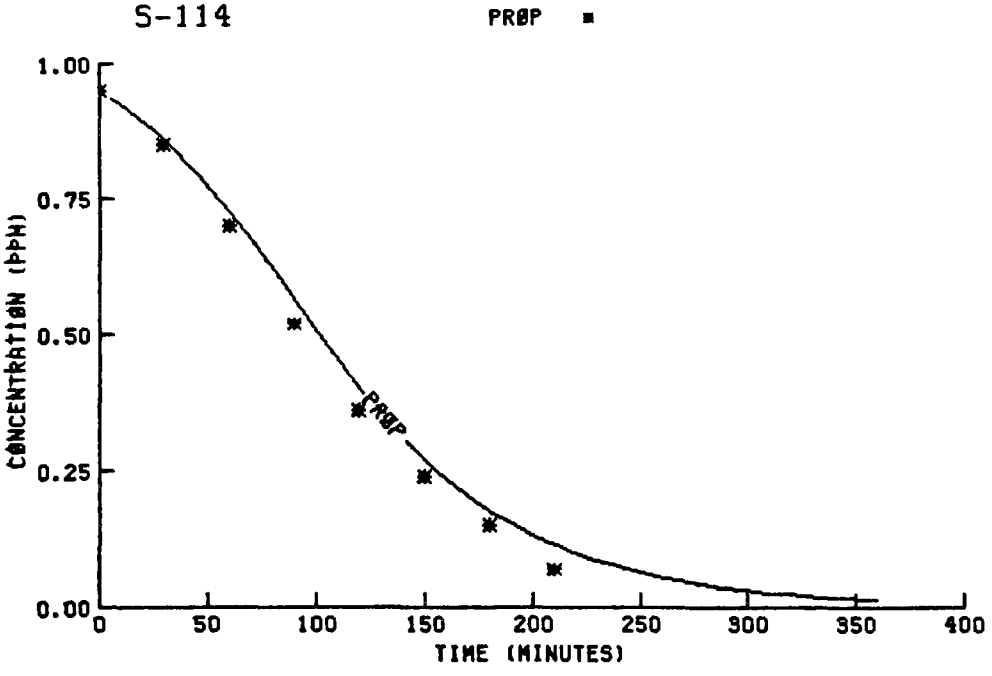

RTI4 110CT76
NØ2
NØ
Ø3
0.40
0.30
0.20
0.10
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
Ø3
0
150
300
450
600
750
900
1050
1200
TIME (MINUTES)

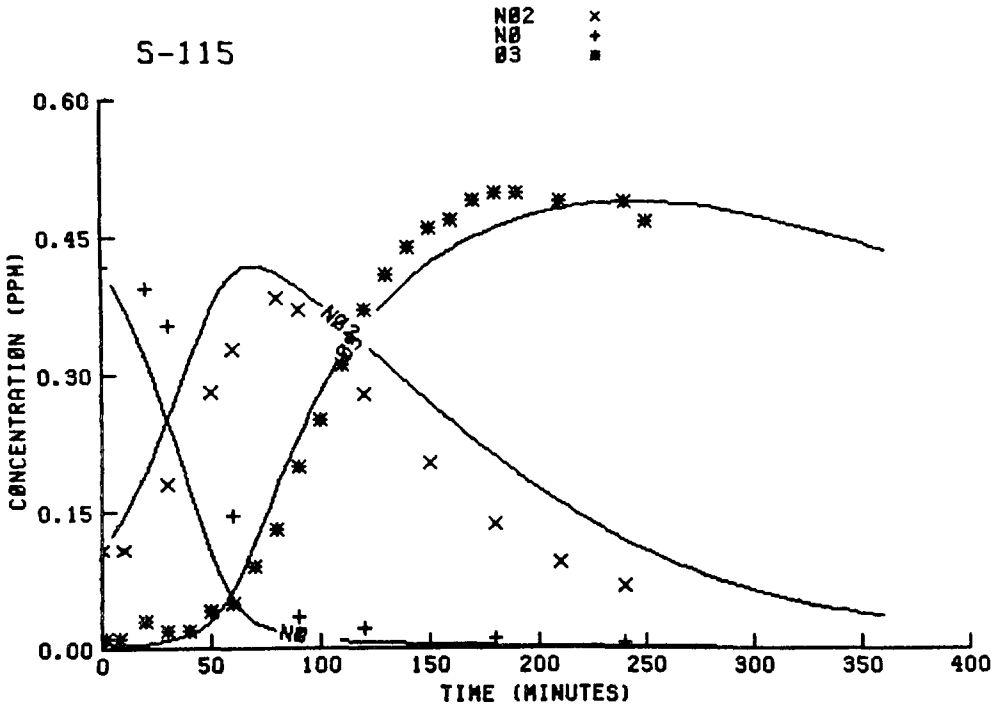
BATTELLE CHAMBER EXPERIMENTS

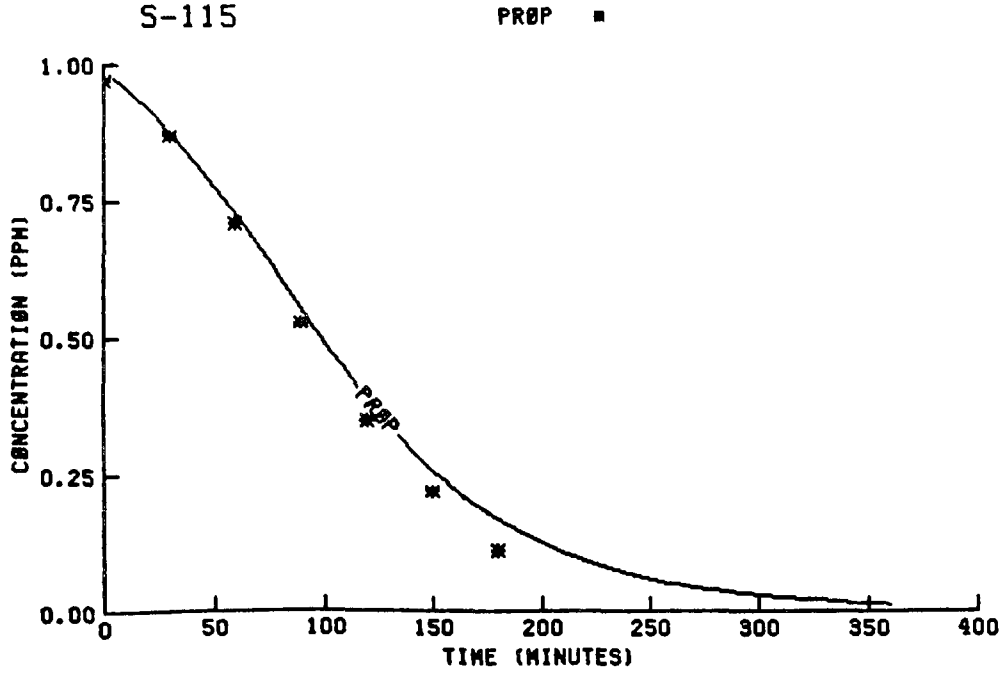

BATELLE S019
NØ2
NØ
Ø3
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
0
30
60
90
120
150
180
210
240
TIME (MINUTES)


BATELLE S019
PRØP
1.60
1.20
0.80
0.40
0.00
CØNCENTRATIØN (PPM)
0
30
60
90
120
150
180
210
240
TIME (MINUTES)

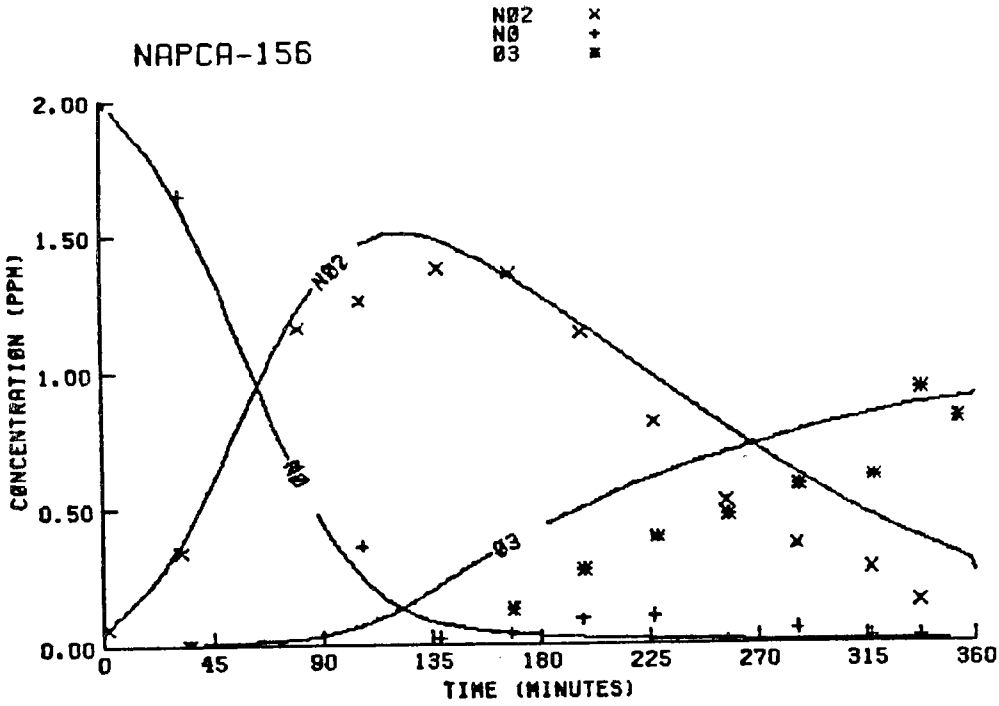

S-114
NØ2 ×
NØ +
Ø3 ■
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
NØ2
NØ

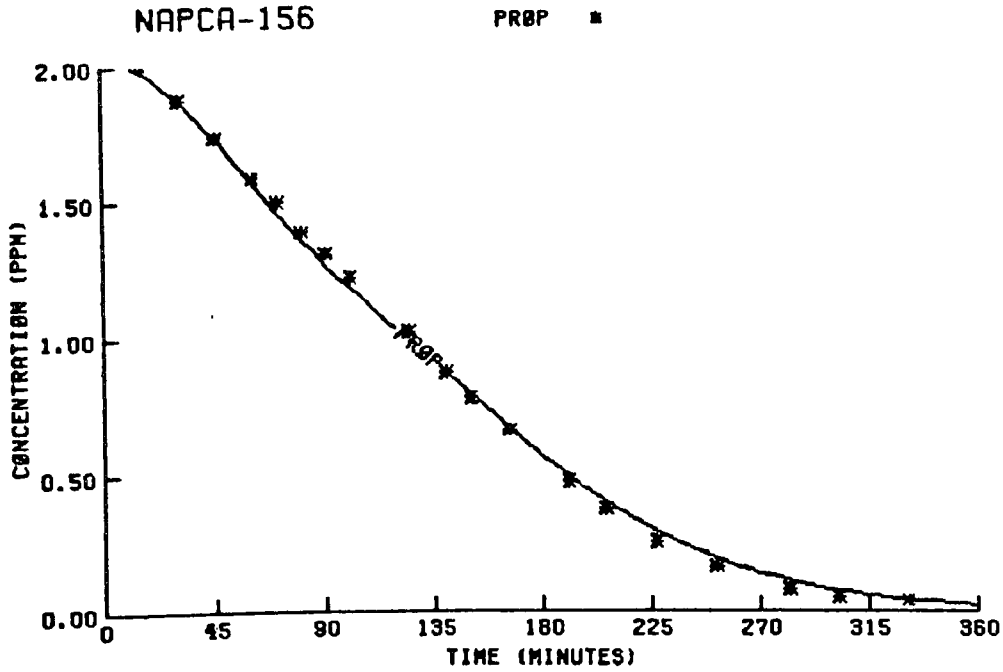

S-114
PRØP ■
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)
PRØP

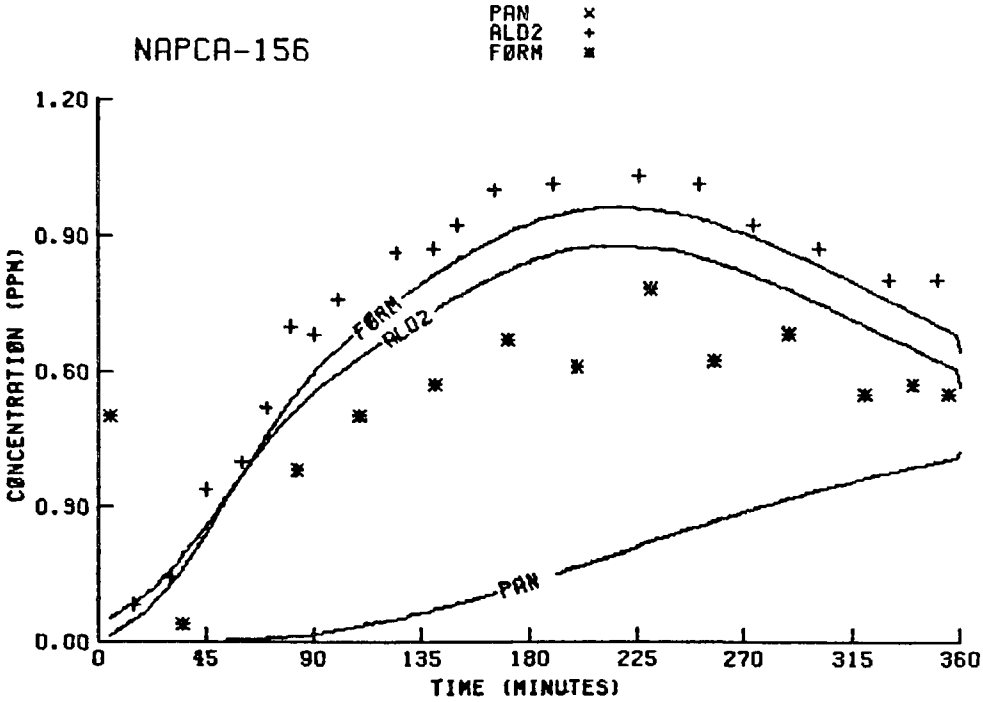

S-115
NØ2 ×
NØ +
Ø3 ■
0.60
0.45
0.30
0.15
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

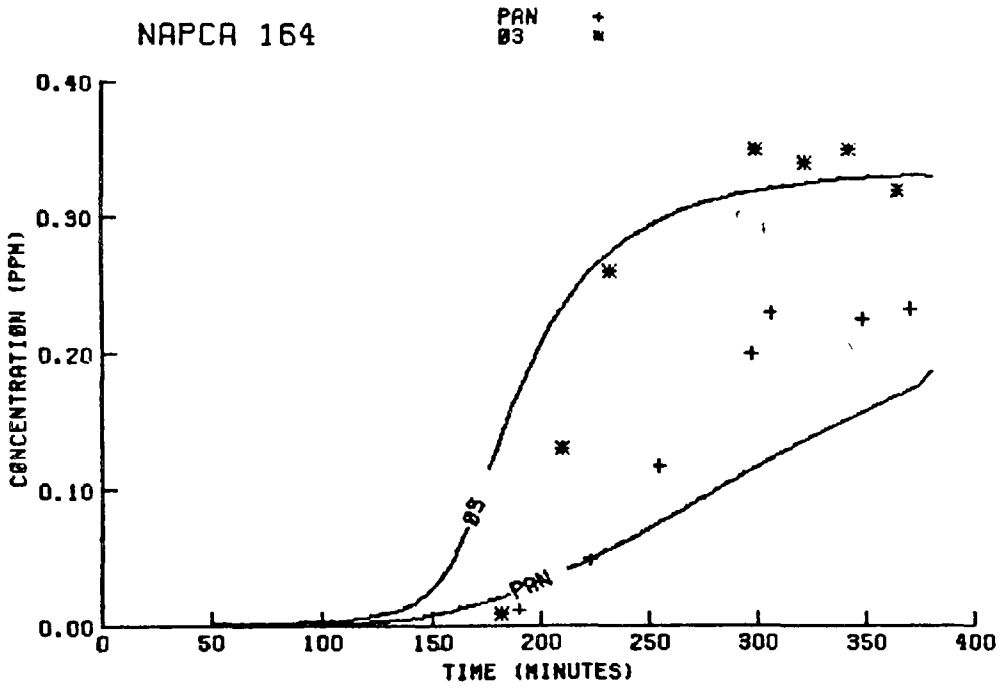

S-115
PRØP ■
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
PRØP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

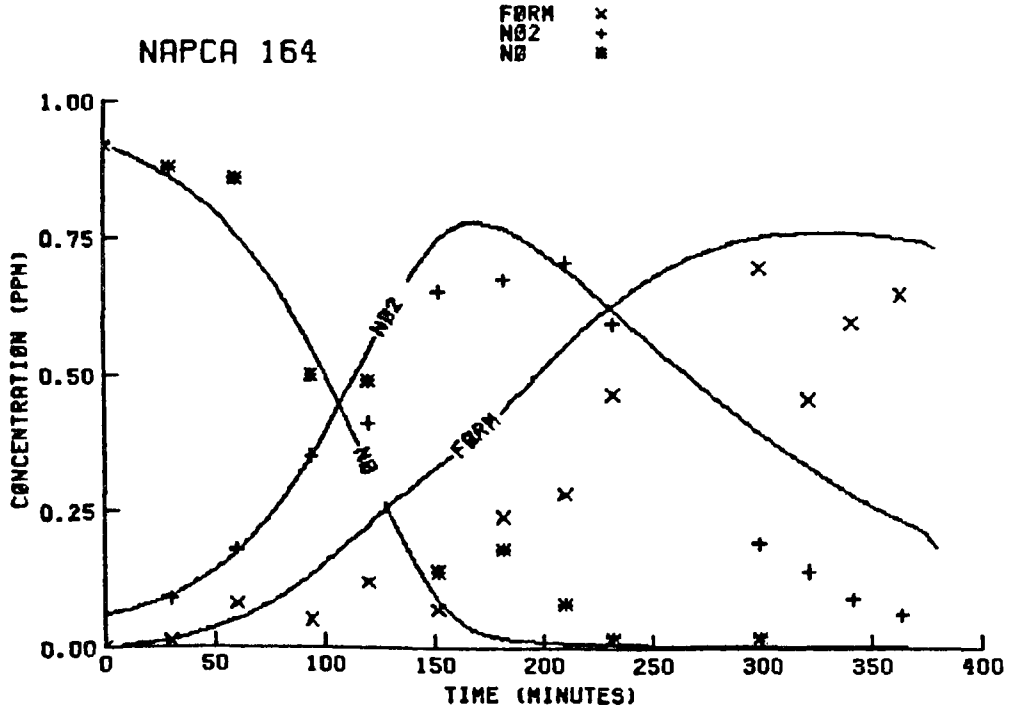
NAPCA CHAMBER EXPERIMENTS

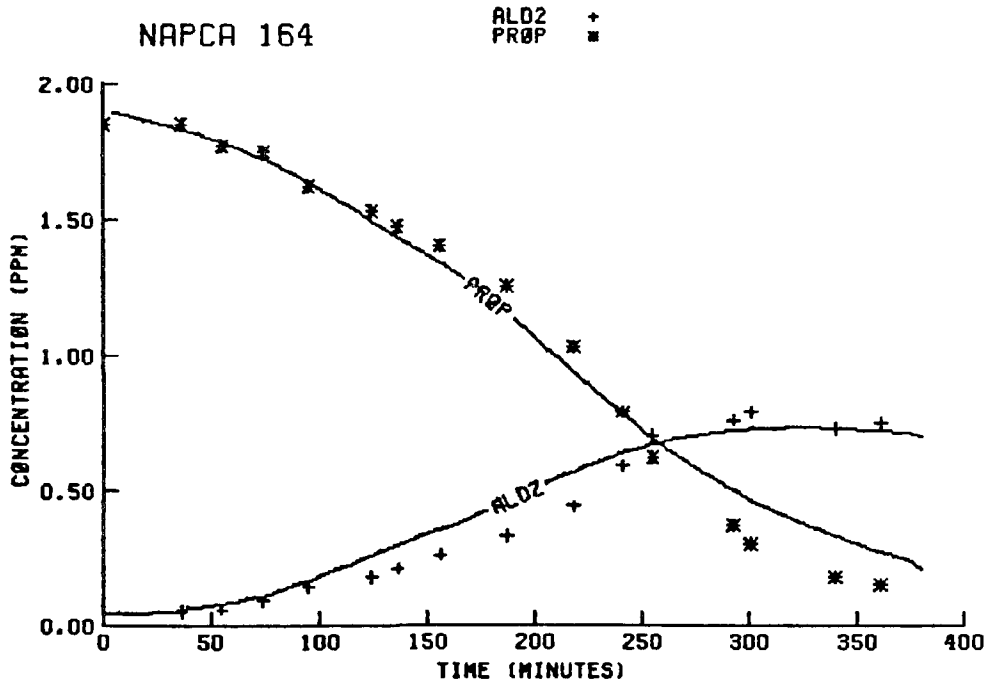

NØ2
NØ
Ø3
NAPCA-156
2.00
1.50
1.00
0.50
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
Ø3
0
45
90
135
180
225
270
315
360
TIME (MINUTES)

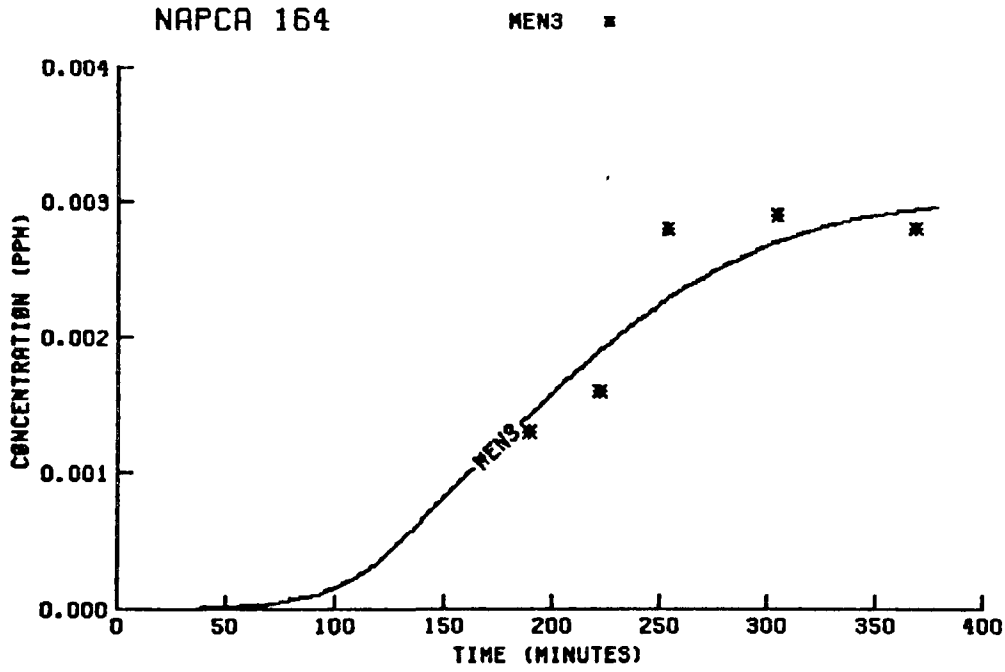

NAPCA-156
PRØP
2.00
1.50
1.00
0.50
0.00
CØNCENTRATIØN (PPM)
PRØP
0
45
90
135
180
225
270
315
360
TIME (MINUTES)

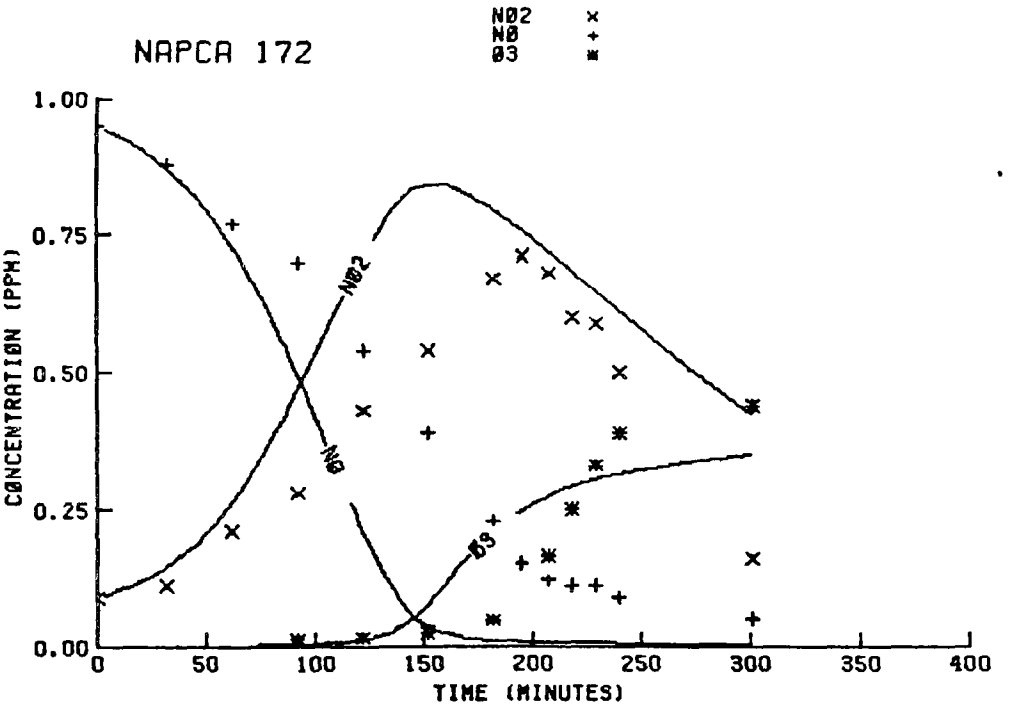

NAPCA-156
PAN
ALD2
FØRM
1.20
0.90
0.60
0.90
0.00
CØNCENTRATIØN (PPM)
FØRM
ALD2
PAN
0
45
90
135
180
225
270
315
360
TIME (MINUTES)

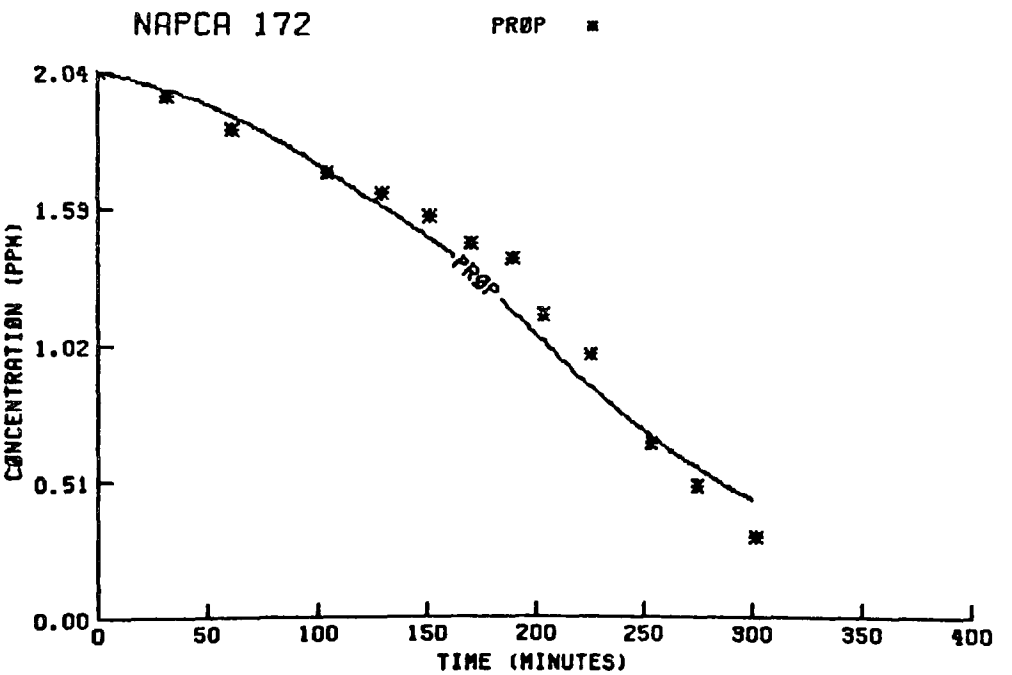

NAPCA 164
PAN +
Ø3 *
0.40
0.30
0.20
0.10
0.00
CØNCENTRATIØN (PPM)
Ø3
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

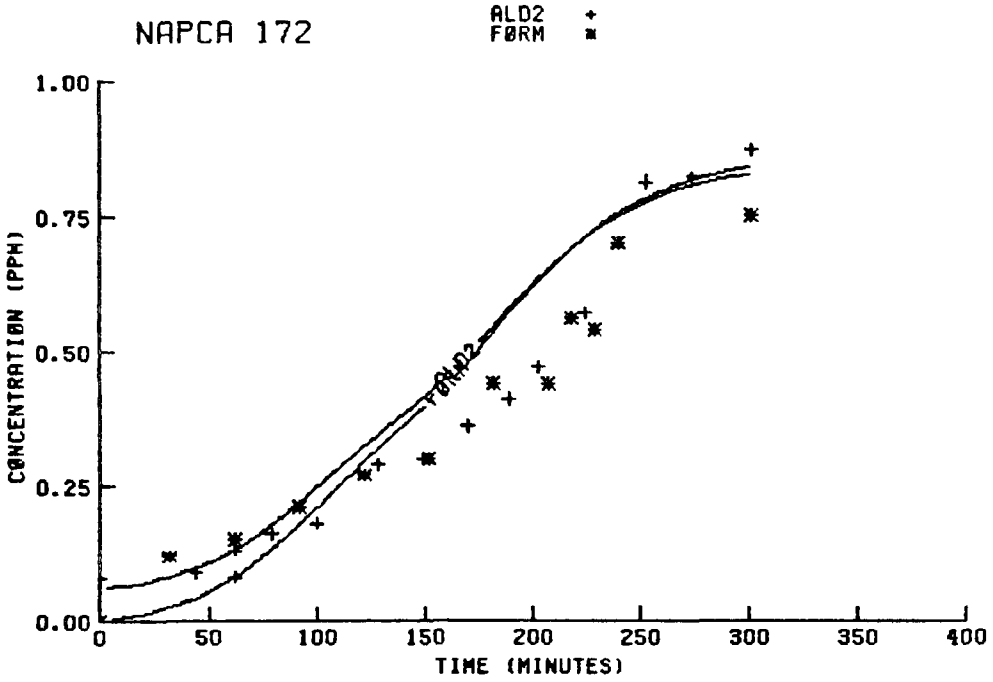

NAPCA 164
FØRM ×
NØ2 +
NØ *
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
FØRM
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

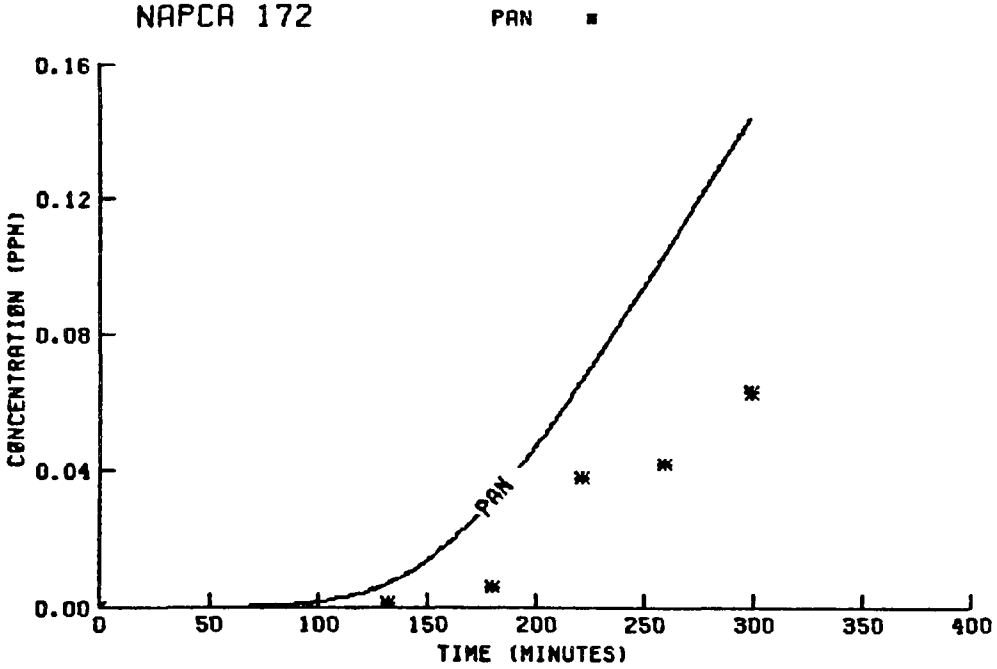

NAPCA 164
ALD2 +
PRØP ✱
2.00
1.50
1.00
0.50
0.00
CØNCENTRATIØN (PPM)
PRØP
ALD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

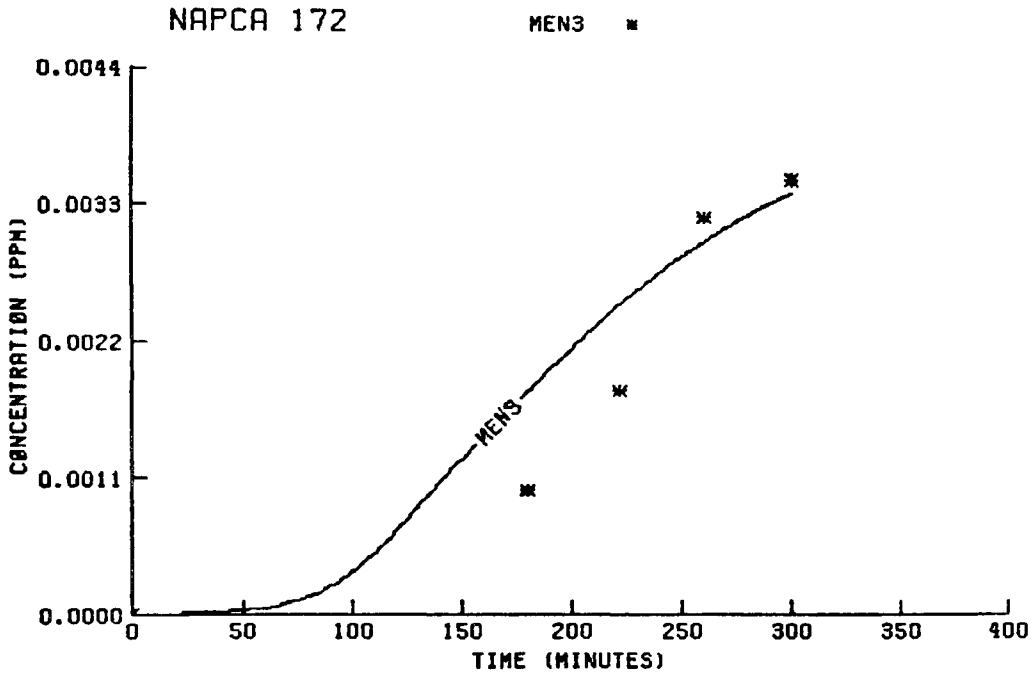

NAPCA 164
MEN3 ✱
0.004
0.003
0.002
0.001
0.000
CØNCENTRATIØN (PPM)
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


NAPCA 172
NØ2
NØ
Ø3
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


NAPCA 172
PRØP
2.04
1.59
1.02
0.51
0.00
CØNCENTRATIØN (PPM)
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


NAPCA 172
ALD2 +
FØRM ■
1.00
0.75
0.50
0.25
0.00
CØNCENTRATIØN (PPM)
FØRMD2
0
50
100
150
200
250
300
350
400
TIME (MINUTES)


NAPCA 172
PAN ■
0.16
0.12
0.08
0.04
0.00
CØNCENTRATIØN (PPM)
PAN
0
50
100
150
200
250
300
350
400
TIME (MINUTES)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MEN3
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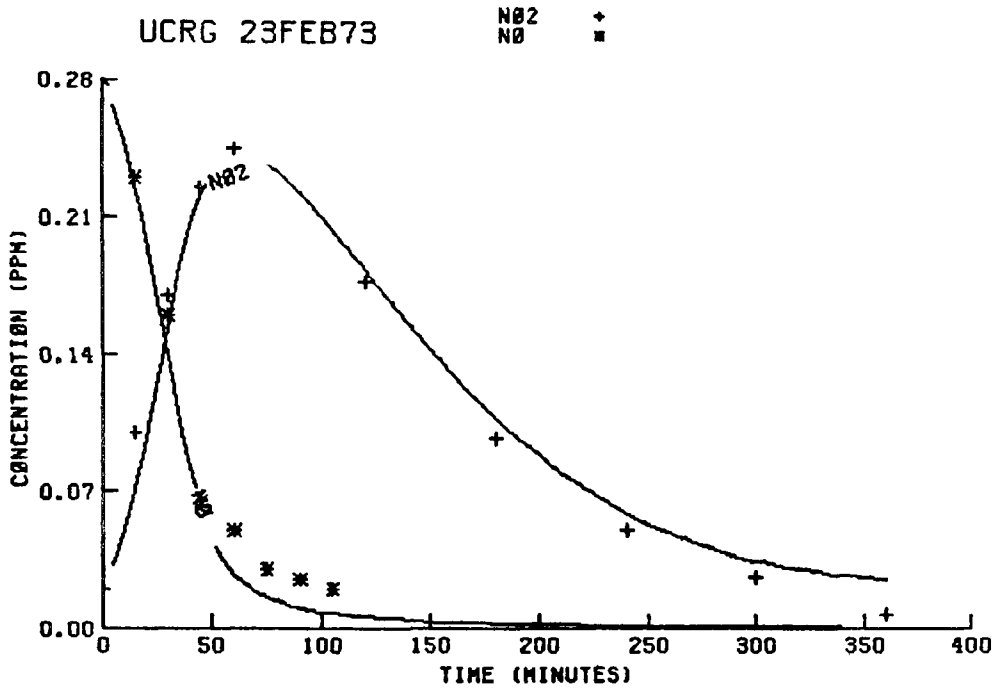
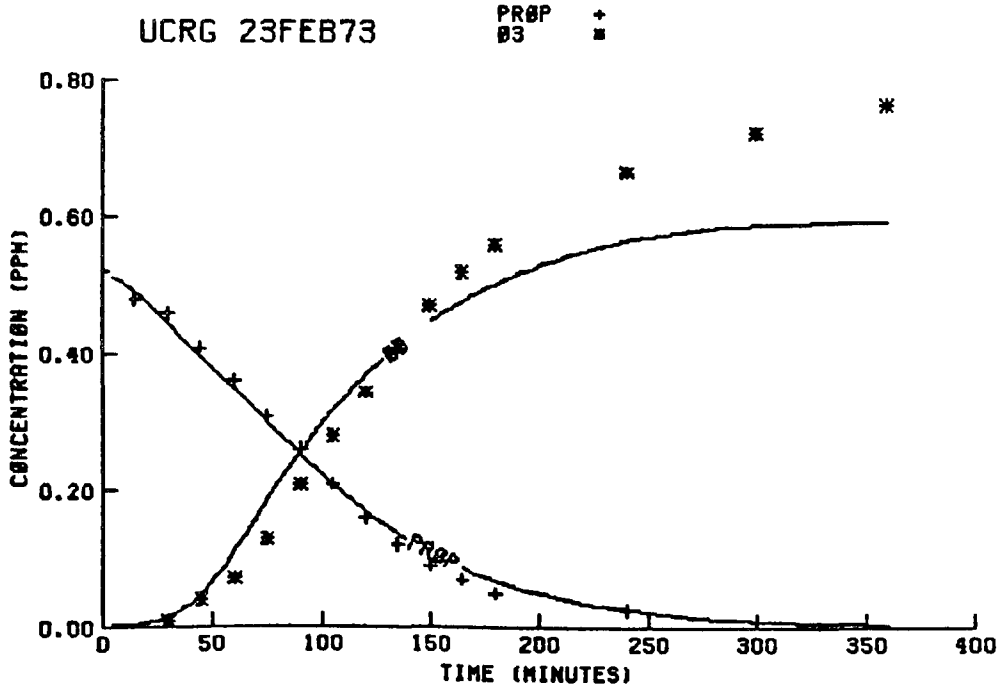
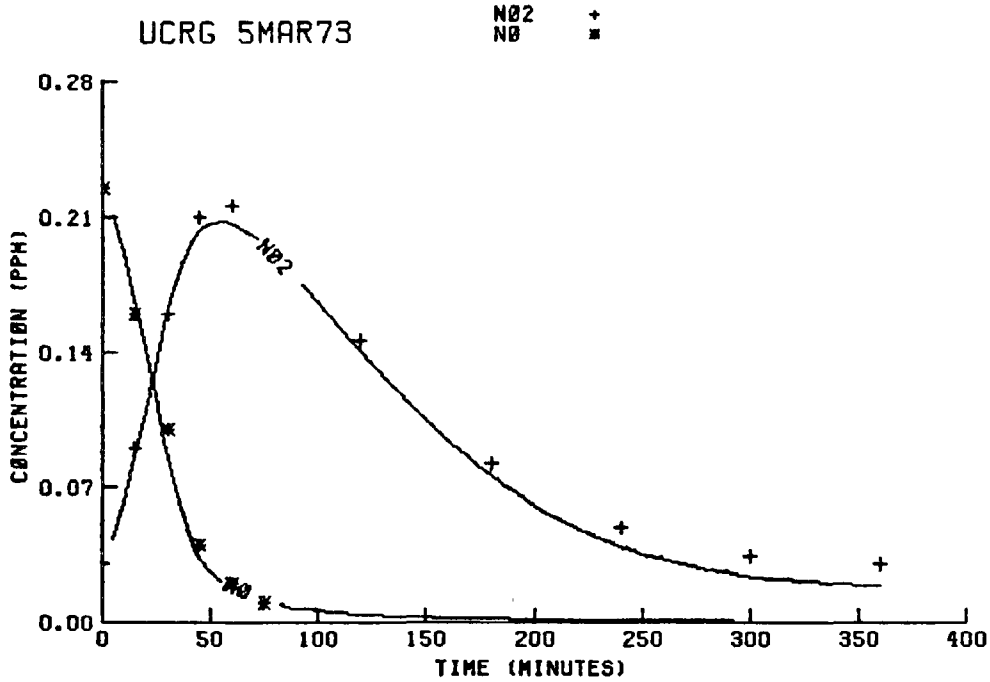
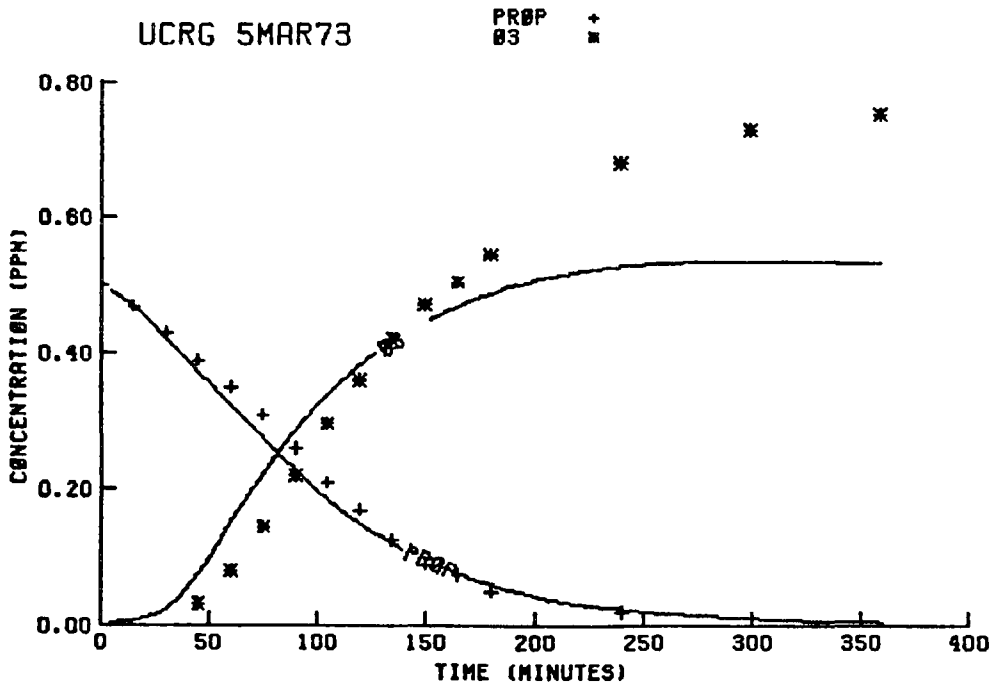
0.0033
0.0022
0.0011
0.0000
CONCENTRATION (PPM)
MEN3
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

UCR-AGC CHAMBER EXPERIMENTS

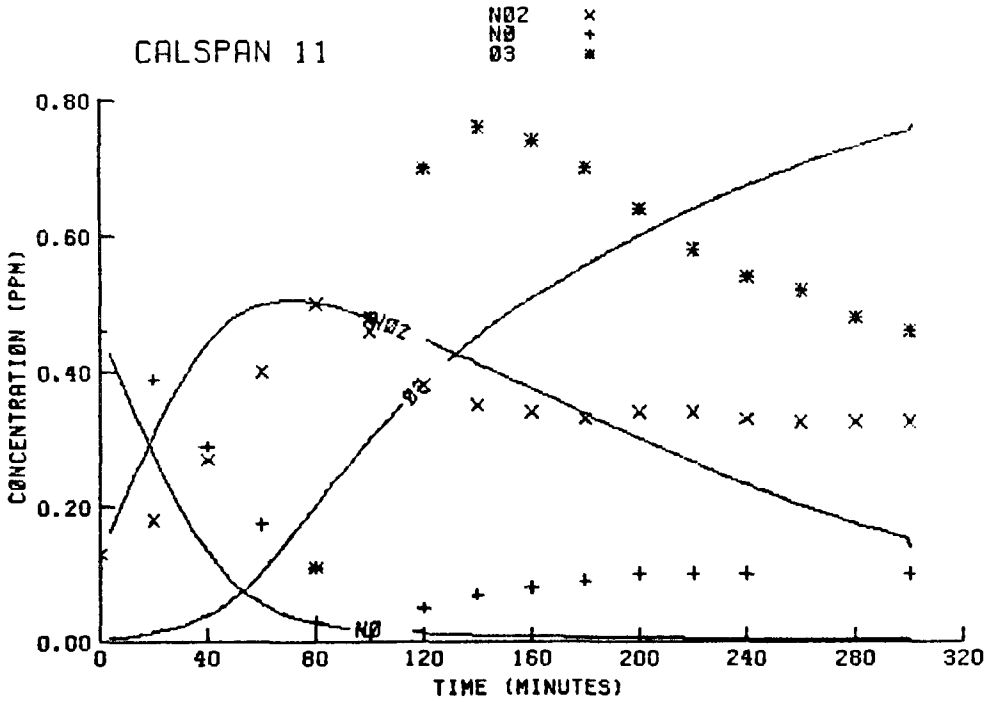

UCRG 23FEB73
NØ2 +
NØ ■
0.28
0.21
0.14
0.07
0.00
CØNCENTRATIØN (PPM)
+NØ2
0 50 100 150 200 250 300 350 400
TIME (MINUTES)

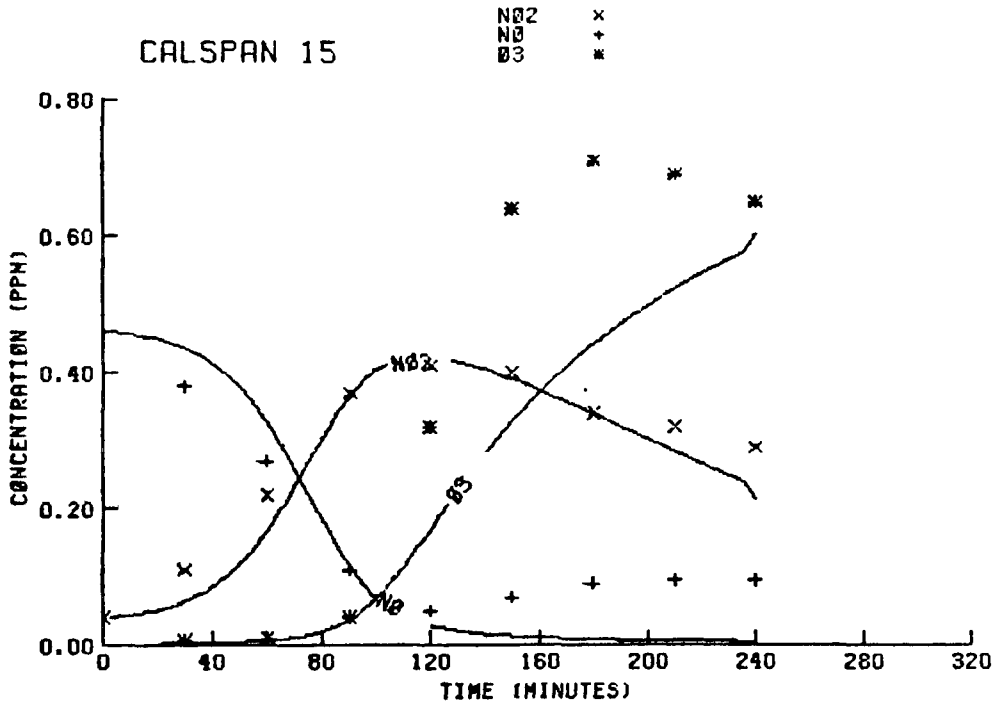

UCRG 23FEB73
PRØP +
Ø3 ■
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
+PRØP
0 50 100 150 200 250 300 350 400
TIME (MINUTES)

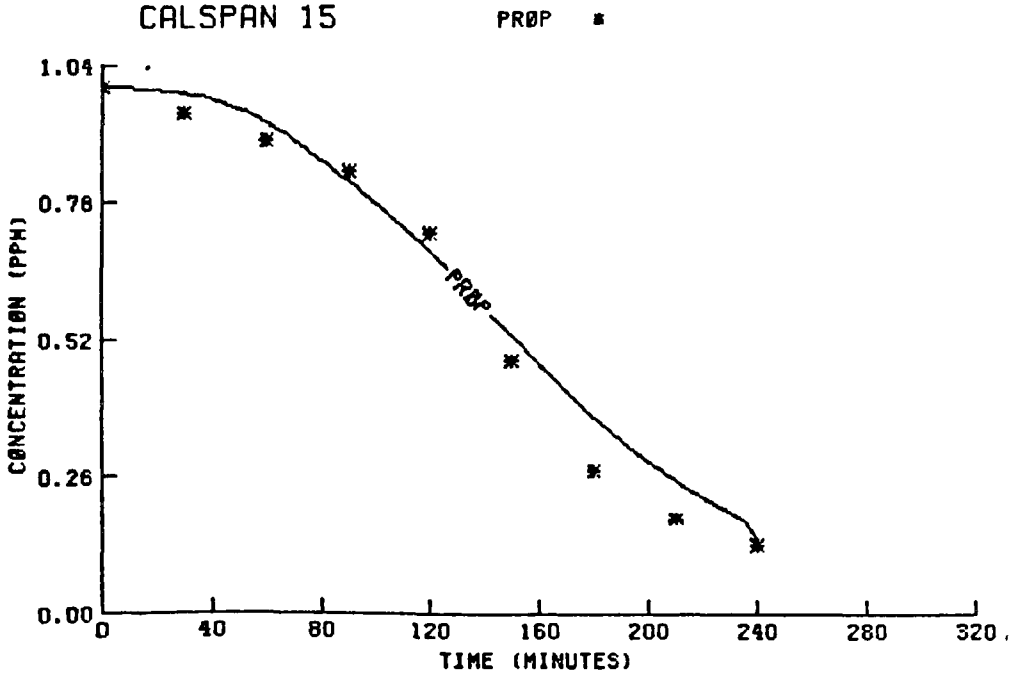

UCRG 5MAR73
NØ2 +
NØ *
0.28
0.21
0.14
0.07
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

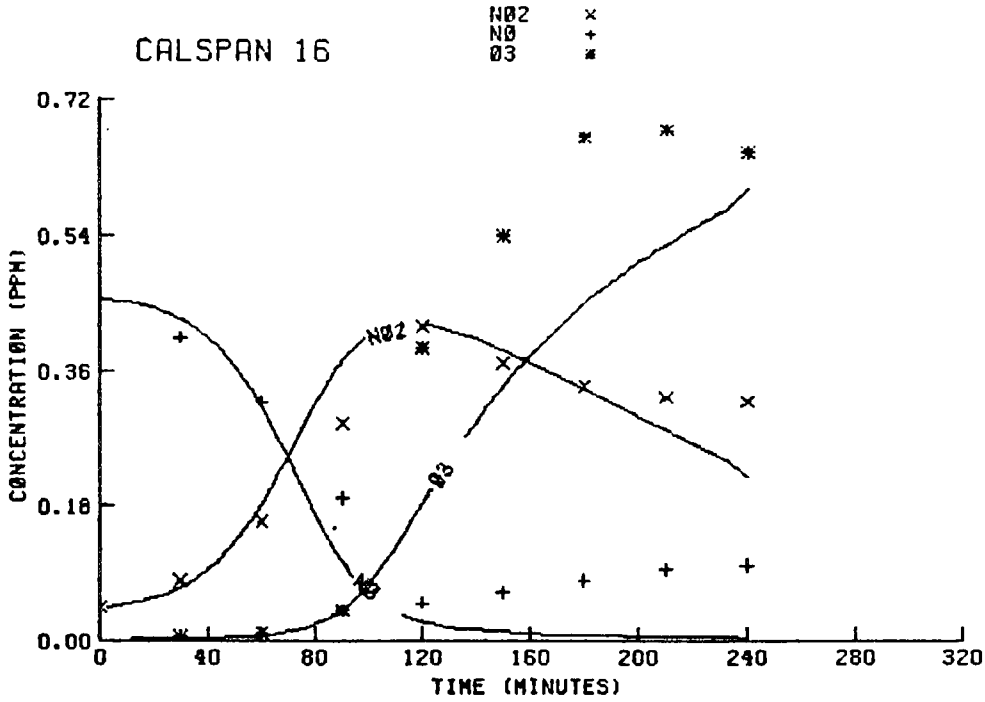

UCRG 5MAR73
PRØP +
Ø3 *
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
PRØP
0
50
100
150
200
250
300
350
400
TIME (MINUTES)

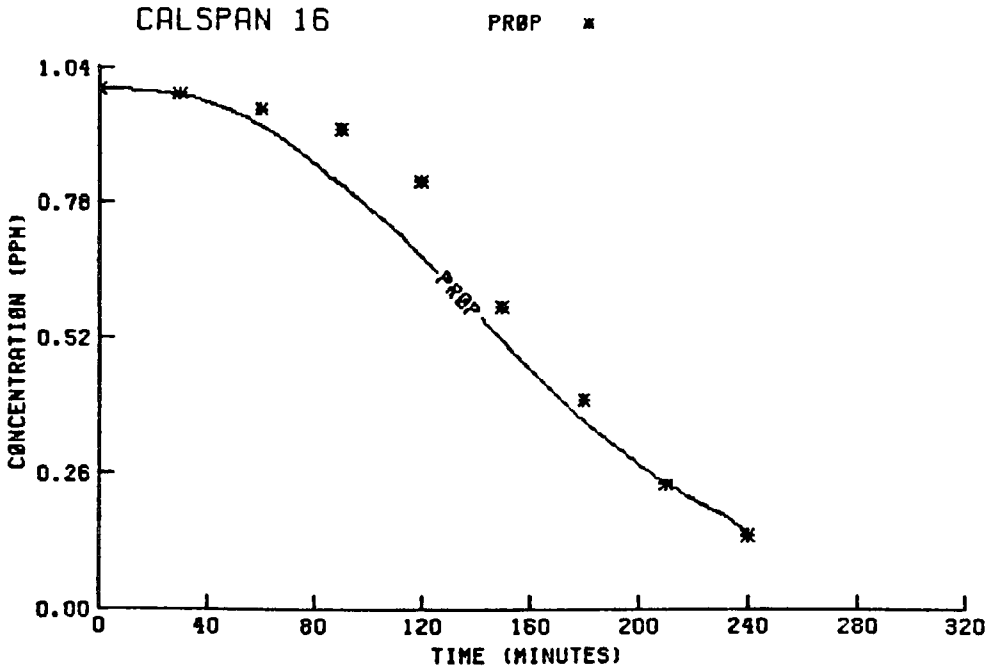
CALSPAN CHAMBER EXPERIMENTS


CALSPAN 11
NØ2
NØ
Ø3
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
0
40
80
120
160
200
240
280
320
TIME (MINUTES)
NØ2
Ø3
NØ


CALSPAN 15
NØ2
NØ
Ø3
0.80
0.60
0.40
0.20
0.00
CØNCENTRATIØN (PPM)
NØ2
Ø3
NØ
0
40
80
120
160
200
240
280
320
TIME (MINUTES)


CALSPAN 15
PRØP
1.04
0.78
0.52
0.26
0.00
CØNCENTRATIØN (PPM)
PRØP
0
40
80
120
160
200
240
280
320
TIME (MINUTES)


CALSPAN 16
NØ2
NØ
Ø3
0.72
0.54
0.36
0.18
0.00
CØNCENTRATIØN (PPM)
NØ2
Ø3
0
40
80
120
160
200
240
280
320
TIME (MINUTES)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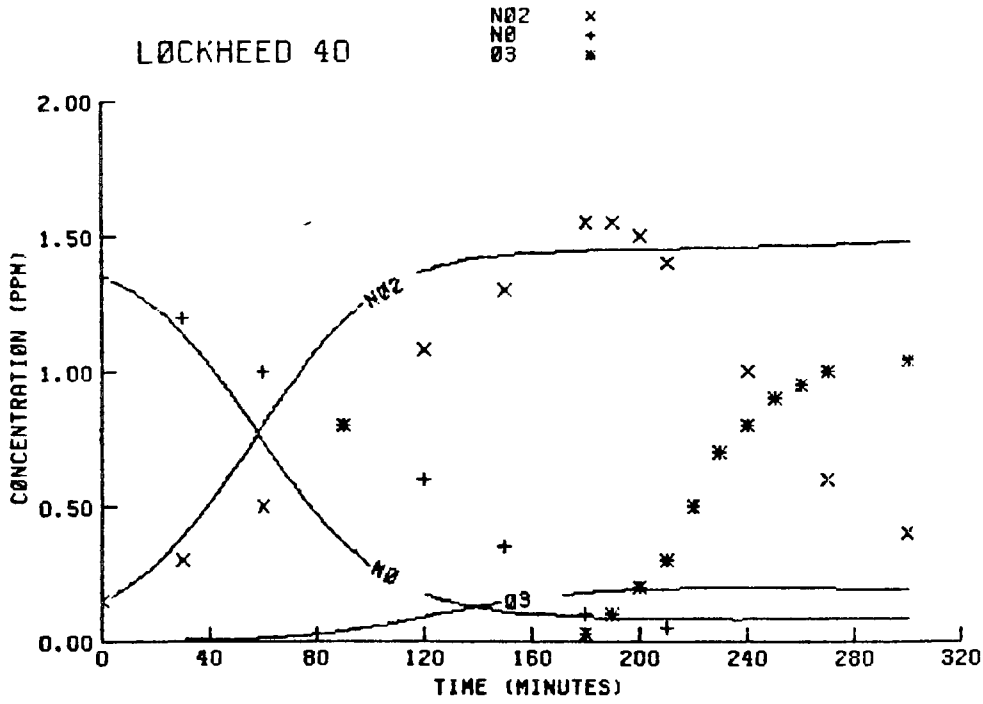
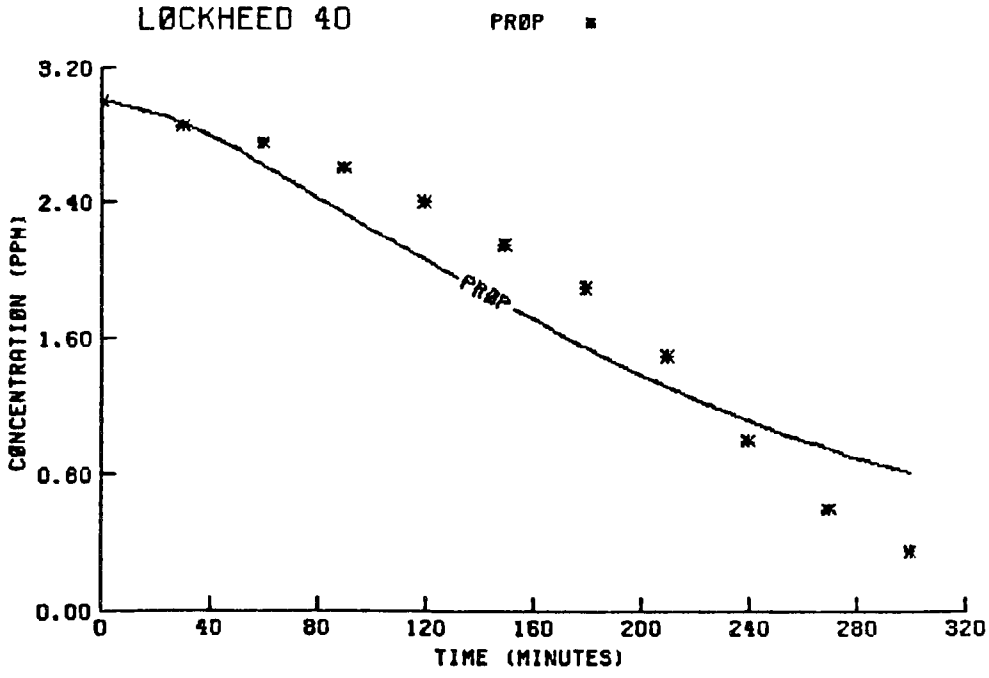
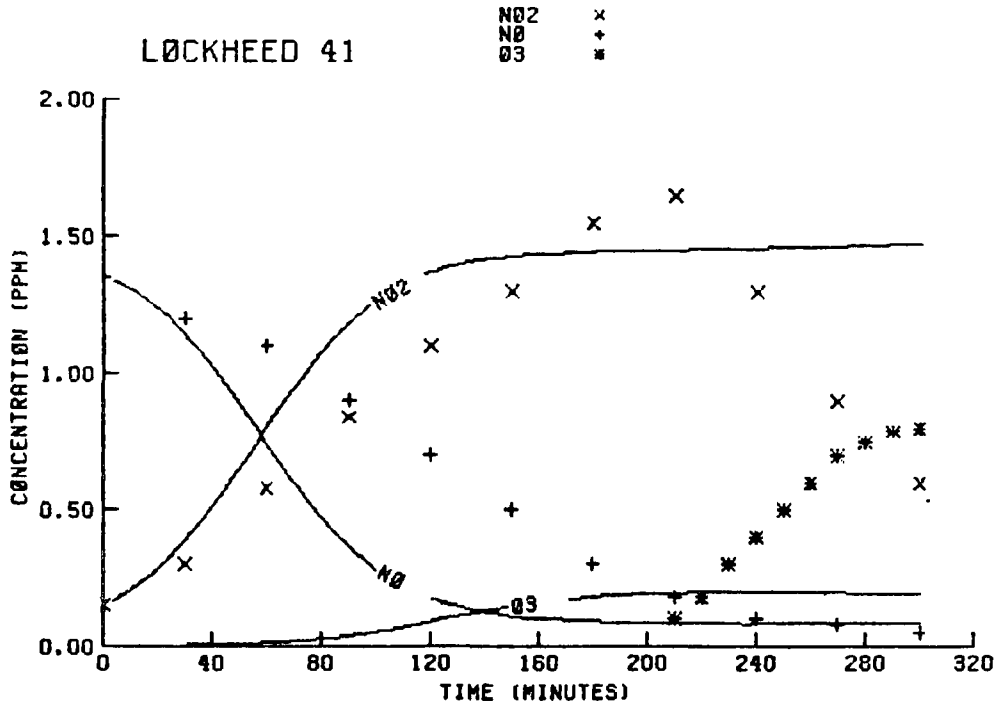
PRØP
1.04
0.78
0.52
0.26
0.00
CØNCENTRATIØN (PPM)
PRØP
0
40
80
120
160
200
240
280
320
TIME (MINUTES)

LOCKHEED CHAMBER EXPERIMENTS


LØCKHEED 40
NØ2
NØ
Ø3
2.00
1.50
1.00
0.50
0.00
CØNCENTRATIØN (PPM)
NØ2
NØ
Ø3
0
40
80
120
160
200
240
280
320
TIME (MINUTES)


LØCKHEED 40
PRØP
3.20
2.40
1.60
0.80
0.00
CØNCENTRATIØN (PPM)
PRØP
0
40
80
120
160
200
240
280
320
TIME (MINUTES)


LØCKHEED 41
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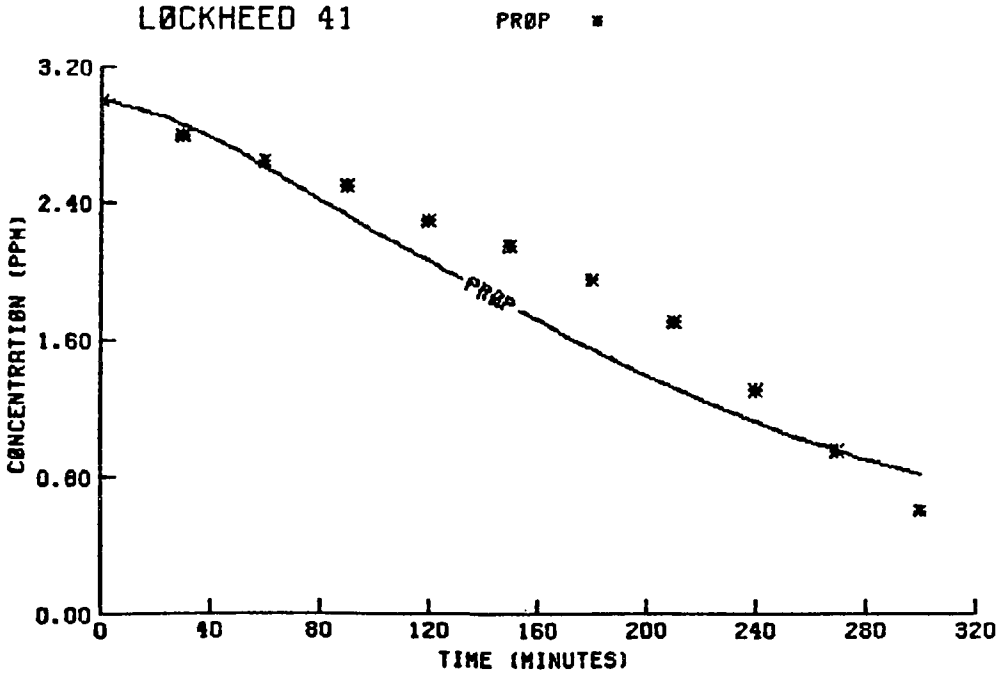
NØ
Ø3
2.00
1.50
1.00
0.50
0.00
CØNCENTRATIØN (PPM)
0
40
80
120
160
200
240
280
320
TIME (MINUTES)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PRØP
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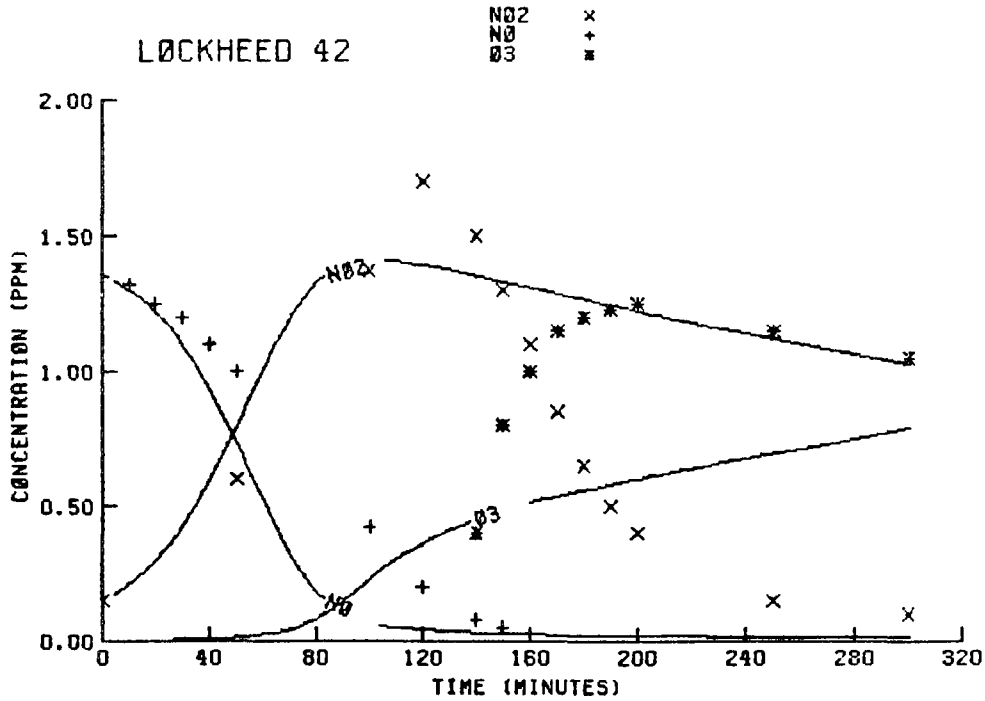
2.40
1.60
0.80
0.00
CØNCENTRATIØN (PPM)
0
40
80
120
160
200
240
280
320
TIME (MINUTES)


LØCKHEED 42
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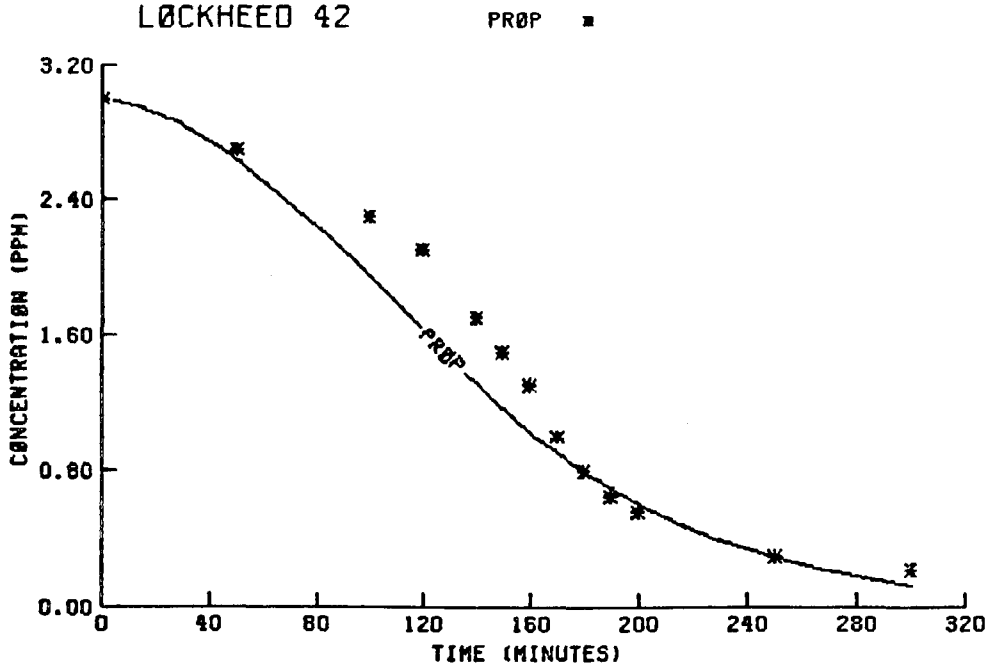
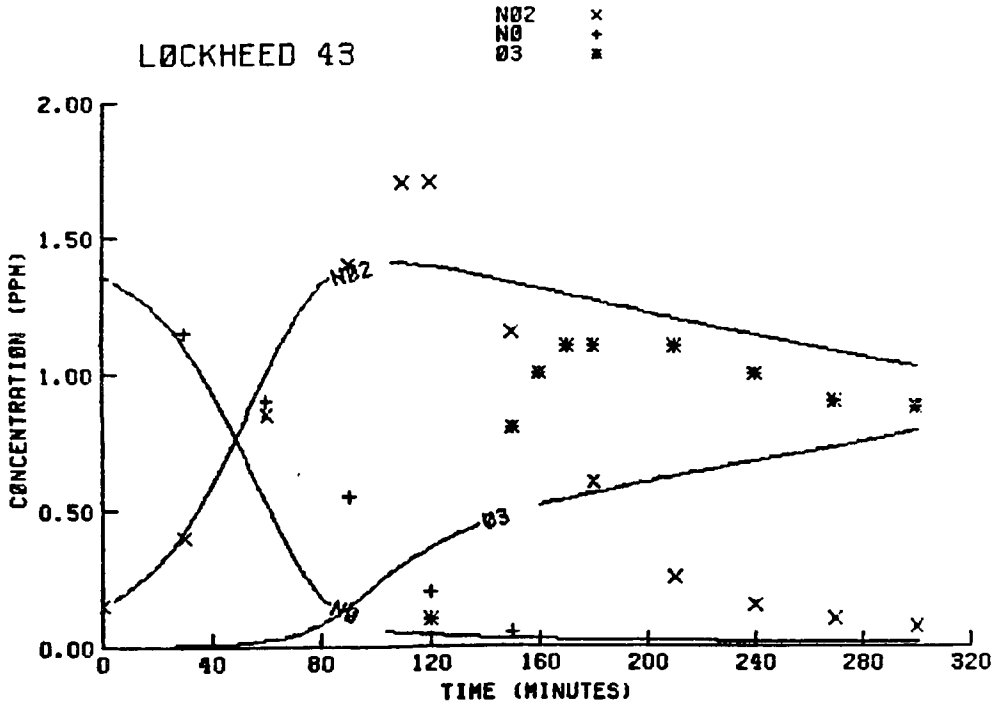
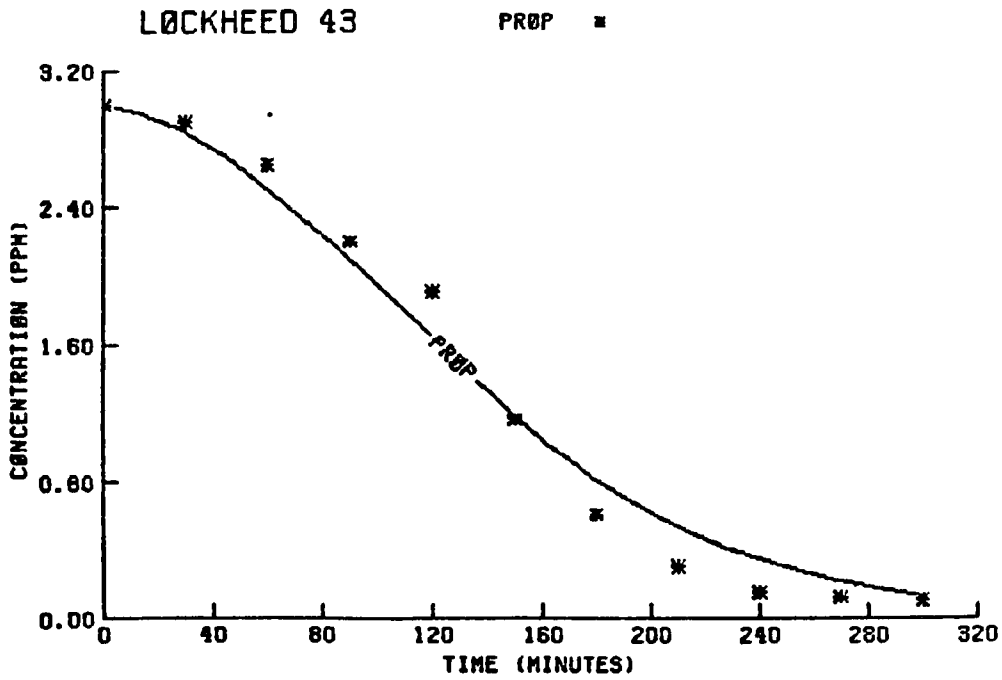
NØ
Ø3
2.00
1.50
1.00
0.50
0.00
CØNCENTRATIØN (PPM)
0
40
80
120
160
200
240
280
320
TIME (MINUTES)


LØCKHEED 42
PRØP
3.20
2.40
1.60
0.80
0.00
CØNCENTRATIØN (PPM)
0
40
80
120
160
200
240
280
320
TIME (MINUTES)


LØCKHEED 43
NØ2
NØ
Ø3
2.00
1.50
1.00
0.50
0.00
CØNCENTRATIØN (PPH)
0
40
80
120
160
200
240
280
320
TIME (MINUTES)


LØCKHEED 43
PRØP
3.20
2.40
1.60
0.80
0.00
CØNCENTRATIØN (PPH)
0
40
80
120
160
200
240
280
320
TIME (MINUTES)

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

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EPA-600/3-79-001b		

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15. SUPPLEMENTARY NOTES

Volume 1. Interim Report EPA-600/3-79-001a

16. ABSTRACT

Computer modeling of smog chamber data is discussed in three parts. First, a series of detailed chemical mechanisms were developed to describe the photochemical formation of ozone from nitrogen oxides and the following organic compounds (alone and in various combinations): formaldehyde, acetaldehyde, ethylene, propylene, butane, 1-butene, trans-2-butene, and 2,3-dimethylbutane. Second, a generalized kinetic scheme intended for use in models simulating the formation of ozone in urban atmospheres was refined. The generalized mechanism includes a condensed version of the detailed mechanisms developed in the first part plus a semi-empirical scheme to describe the oxidation of aromatic hydrocarbons. Third, the effects of smog chambers on ozone formation were examined. For this part of the study, similar experiments using nitrogen oxides and propylene in eight different smog chambers were simulated using the detailed propylene mechanism. The main chamber effects identified thus far are apparently due to nitrogen oxides degassing from the walls during experiments and differences between chambers in the spectral distribution of ultraviolet irradiation.

Volume 1 contains all textual material. Volume 2 contains graphs of measured and simulated pollutant concentrations for many smog chamber experiments.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
* Air pollution		13B
* Reaction kinetics		07D
* Photochemical reactions		07E
Test chambers		14B
* Mathematical models		12A
* Computerized simulation		09B

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	UNCLASSIFIED	

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