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**FOURIER TRANSFORM INFRARED (FTIR) METHOD VALIDATION
AT A COAL-FIRED BOILER**

**EPA Contract No. 68D20163
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1.0 INTRODUCTION

1.1 BACKGROUND

This report describes results of the Fourier transform infrared (FTIR) method field validation test that was conducted at a coal-fired boiler facility. The validation test was conducted from January 25 to February 10, 1993 by Dr. Grant M. Plummer, Mr. Scott A. Shanklin, Mr. Greg C. Blanschan, Dr. Thomas A. Dunder, Dr. Thomas J. Geyer, Ms. Lisa M. Grosshandler, Dr. Ed Potts, Ms. Patricia Royals, Mr. Rick Strausbaugh, and Mr. Mike Worthy, of Entropy Environmentalists, Inc., under U.S. EPA Contract No. 68D20163, Work Assignment No. 2.

FTIR spectrometry is of interest in emissions testing because of its usefulness in performing multicomponent gas analyses. Because each distinct molecular structure possesses a distinct infrared absorption spectrum, FTIR instruments can provide quantitative and qualitative information on the composition of sample gases. This aspect of the technique, along with its potential for providing near-real-time analytical results, is particularly important considering the number of hazardous air pollutant (HAP) compounds listed in the Clean Air Act Amendment of 1990.

FTIR-related tasks previously performed by Entropy include the development of infrared reference spectra, laboratory investigations of sampling and analytical techniques, and performance of screening tests. Entropy has also prepared a draft protocol describing field and laboratory test procedures, and has developed prototype software for use in performing FTIR spectrometric emission measurements. The goals of these activities are to provide quantitative and qualitative information regarding the emission of hazardous air pollutants from various industrial processes, and to further the development of a valid emission test method based on FTIR technology.

Screening tests were conducted during 1992 at several industrial facilities, and provided data on the performance and suitability of FTIR spectrometry for HAP measurements. In most of these tests, gas samples were extracted, filtered, and delivered directly to the FTIR system for infrared analysis. This type of sampling and analysis is referred to below as the "direct gas extraction" technique. Initial estimates of the mass emission rates of a number of these compounds, at over 30 process locations of seven different types of facilities, were based on the spectroscopic and flow rate data obtained during the screening tests. These tests helped determine sampling and analytical limitations and provided qualitative information on the emission stream composition.

One screening test was performed by Entropy at a coal-fired utility boiler. As expected on the basis of pre-test calculations, the usefulness of the direct gas extraction technique for measuring HAP compounds at the concentrations corresponding to 10 tons of emissions per year was found to be limited. This is because of the rather large effluent flow rates typical of such boilers; even small concentrations (i.e., sub ppm levels) of HAP's in the effluent output of the boiler can lead to potentially large yearly mass emissions. It was, therefore, necessary to develop and test

the "sample concentration" technique (described below) before quantification of HAP's by FTIR spectrometry could be attempted at such facilities.

The utility boiler screening test also provided data on the spectral interferences expected to occur between the HAP compounds and the boiler's major gaseous effluent sample constituents. This information was used in preparation for the "validation" testing described in this report, the goal of which is to provide statistical information concerning application of the method to gaseous HAP concentration measurements. The term "validation" is borrowed from EPA's Method 301 ("Field Validation of Pollutant Measurement Methods from Various Waste Media"), upon which the methods of the tests described here were based.

1.2 PURPOSE AND DESCRIPTION OF THE PROJECT

The procedures described in this report were designed to test FTIR spectrometry in conjunction with both the direct gas phase and concentration/thermal desorption sampling techniques, with the goal of determining the bias, precision, and range (sensitivity) of the measurement techniques. Comparison of these values to the requirements of EPA Method 301¹ were made on a compound-by-compound basis to determine the validity of the FTIR methods for testing of emissions from this type of source.

The FTIR-based method uses two different sampling techniques: (1) direct gas phase extraction and (2) sample concentration followed by thermal desorption. The direct gas phase sampling system extracts gas from the sample point and transports the sample to a mobile laboratory where sample conditioning and FTIR gas phase analyses are performed. The sample concentration system employs 10 grams of Tenax sorbent, which can remove some organic compounds from a large volume (typically 300 liters) of sample gas. These compounds are thermally desorbed into the smaller FTIR absorption cell volume (8.5 liters), providing a volumetric concentration which allows detection of some compounds down to the ppb level in the original sample.

Entropy operates a mobile laboratory (FTIR truck) that is equipped with the FTIR instrumentation and sampling equipment. The truck was driven to the facility and parked directly beneath the sampling port locations. Equipment was then installed and samples were obtained according to the procedures described in Sections 3.0 and 4.0. Both direct gas phase and thermal desorption samples were collected each day between the hours of 8:00 A.M. and 6:00 P.M. FTIR spectra of the gas phase samples were obtained as the samples were collected. Spectra of the desorption samples were acquired on the evening of the day they were collected.

1.3 KEY PERSONNEL

The Emissions Measurement Branch (EMB) and the Industrial Studies Branch (ISB) under the EPA Office of Air Quality Planning and Standards (OAQPS) were responsible for administering this project. Listed below are the organizations and personnel who were involved in coordinating and performing this project.

EMB Work Assignment Manager: Ms. Lori Lay

Industrial Studies Branch (ISB) Contacts: Mr. Kenneth Durkee
Mr. Bill Maxwell

Entropy Project Manager: Dr. Grant M. Plummer

Entropy Test Personnel: Dr. Tom Dunder
Dr. Tom Geyer
Mr. Scott Shanklin
Ms. Lisa Grosshandler
Dr. Laura Kinner
Dr. Craig Stone
Ms. Patricia Royals
Mr. Greg Blanschan
Mr. Ricky Strausbaugh
Mr. Mike Worthy

2.0 PROCESS DESCRIPTION AND SAMPLE POINT LOCATIONS

2.1 PROCESS DESCRIPTION

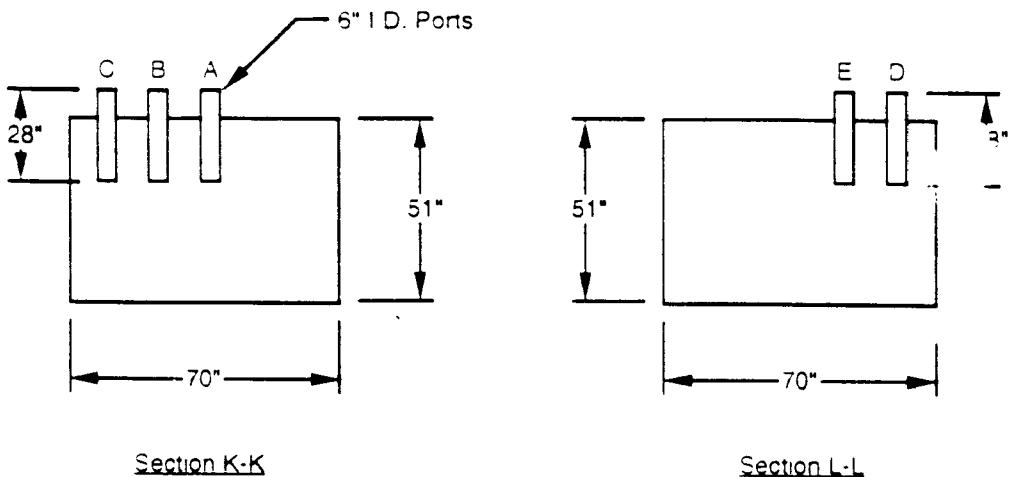
The test facility consists of five boilers. Testing was performed on Unit 2, which is a bituminous coal-fired boiler with an approximate heat input of 68 MBtu/hr. Bituminous coal is pulverized and blown into the combustion chamber by fans, providing simultaneous fuel suspension and combustion. The combustion gases and particulate exiting the boiler pass through an air preheater, baghouse, and an induced draft (I.D.) fan before being exhausted to the atmosphere via a stack (see Figure 1).

Measurements during this screening test were made on the outlet location of the Unit 2 baghouse. Direct gas extraction testing employed 30.5 meters (100 feet) of heated sample line to connect the sampling probe to the heated manifold in the FTIR truck (see Section 3.1). Concentrated samples were obtained at the sampling port locations (see Section 3.2).

2.2 BAGHOUSE OUTLET SAMPLE POINT LOCATION

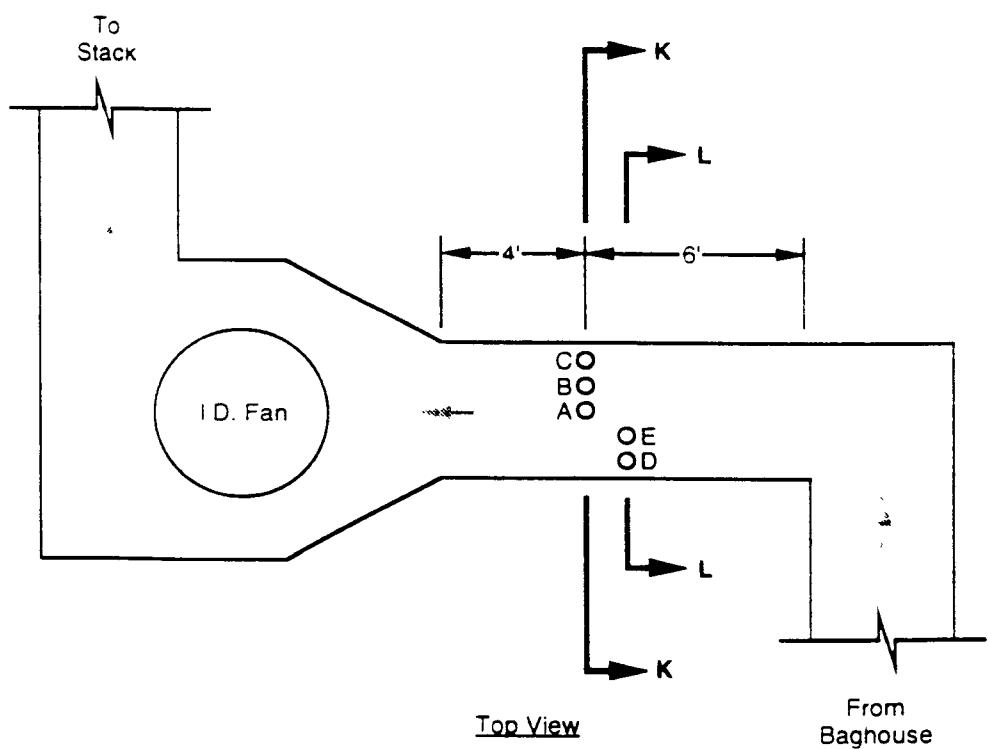
Five 6-inch diameter sample ports were available at the outlet of the baghouse, a location that is approximately 1.2 meters upstream of the I.D. fan. The ports were equally spaced along a 1.9 meter wide section of the duct that was approximately 1.9 meters deep. Access to this location was provided by stairs and a catwalk. Each probe sampled effluent at a point near the center of the duct. Electric power was available at a level below the sample point location (approximately 7.5 meters). The average temperature of the flue gas was approximately 160°C (320°F).

Direct gas phase extraction and sample concentration samples were taken from ports E and A, respectively. Flow measurements were conducted daily using all the available ports.



Section K-K

Section L-L



3.0 EMISSION TEST SYSTEM DESCRIPTION

Two different experimental techniques were employed. The first, referred to as direct gas extraction, introduced the gas stream to the sample manifold in the mobile unit from where it could be sent to the infrared cell. It is expected that direct gas extraction provides a representative sample by maintaining gas composition. A second technique, referred to as sample concentration, passed a known volume of gas through an absorbing material packed into a U-shaped stainless steel collection tube. After sampling was completed, the tube was then heated and any collected compounds were desorbed into the FTIR cell and diluted with nitrogen to one atmosphere total pressure. With this technique, concentrations of species detected in the absorption cell are generally higher than their concentrations in the effluent so that it is possible to achieve lower detection limits for some HAP's. Any lowering of the detection limit depends on the volume of gas sampled and efficiency with which a particular compound will adhere to, and desorb from, the sorbent. Validation tests of the FTIR technique were conducted using both the extractive gas phase system and the auxiliary sample concentration system. Infrared absorbance spectra of the gas streams from the outlet of the baghouse (see Section 2.0) were recorded and analyzed. Components of the emission test systems prepared by Entropy for this testing are described below.

3.1 DIRECT GAS EXTRACTION

An extractive system was used to transport the gas stream to the FTIR spectrometer in the gaseous phase (see Figure 2).

3.1.1 Sampling System and Procedures

Gas was extracted through an 8-foot heated stainless steel probe. A heated Balston particulate filter rated at 1 micron was installed at the outlet of the sample probe. A 30.5 meter (100 foot) section of heated 3/8-inch O.D. Teflon® sample line connected the probe to the heated sample pump located inside the mobile laboratory. The temperature of the sampling system components was maintained at approximately 150°C. All components were constructed of Type 316 stainless steel, glass, or Teflon®. Digital temperature controllers were used to control and monitor the temperature of the transport lines. All points of connection were wrapped with electric heat tape and insulated to ensure that there were no "cold spots" in the sampling system where condensation might occur. The sample pump provided approximately 12 to 16 L/min of sample gas flow, depending upon sample line length and flue gas conditions at the sampling location. The heated sample flow manifold, located in the FTIR truck, included a secondary particulate filter and valves that allowed the operator to send the sample gas directly to the absorption cell or through one of the gas conditioning systems.

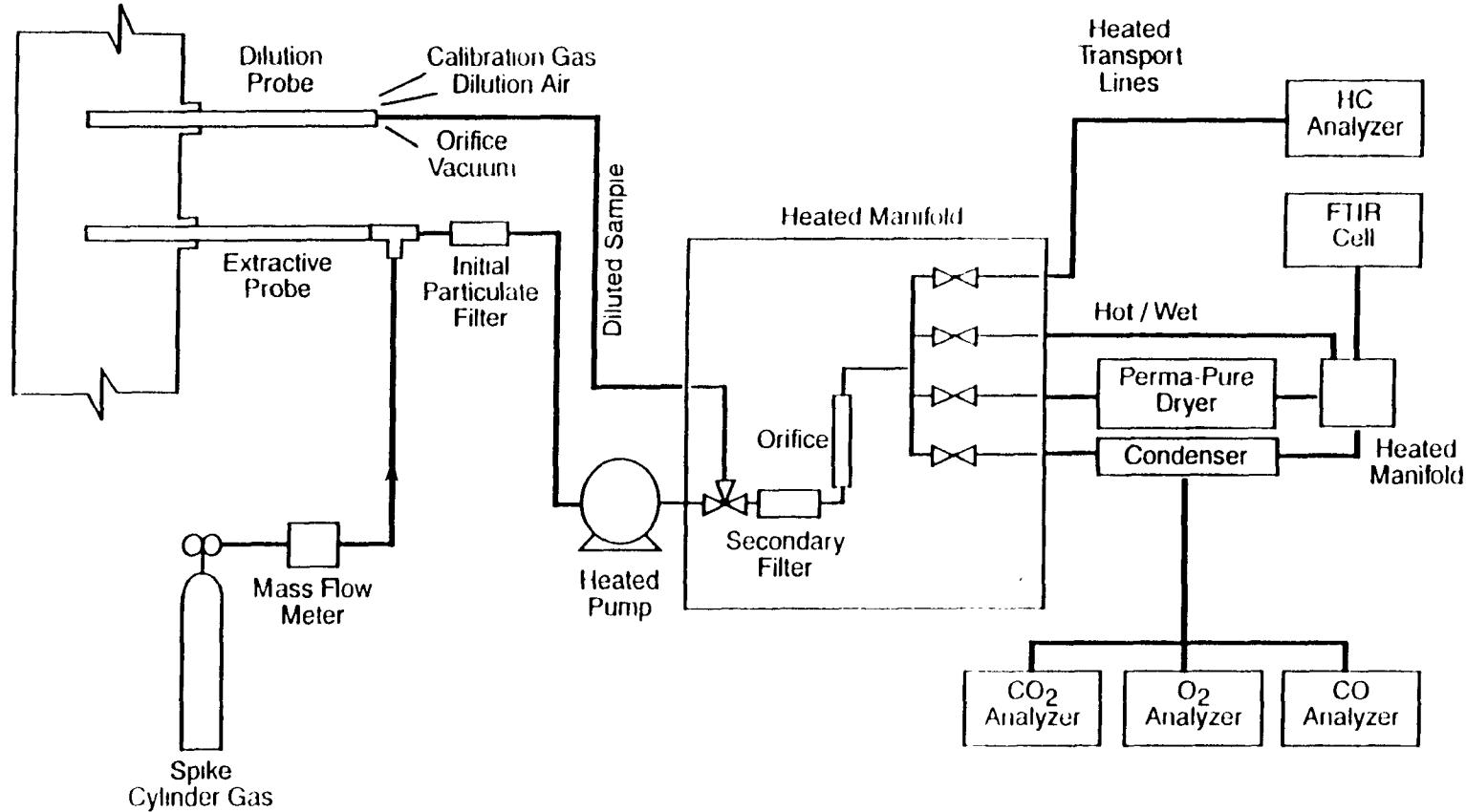


Figure 2. FTIR direct gas sampling system

The extracted gas sample was treated in one of two ways. Sample sent directly to the FTIR cell was considered unconditioned, or "hot/wet." This sample is more representative of the actual effluent composition than any type of intentionally conditioned sample. The gas stream could also be directed through a condenser to remove most of the water. The condenser employed a standard Peltier dryer to cool the gas stream to approximately 3°C. The resulting condensate was collected in two traps and removed from the conditioning system with peristaltic pumps. This technique is known to leave the concentrations of inorganic and highly volatile compounds very near to the stack concentrations (dry-basis). The condenser was tested in an effort to ascertain which HAP's can be reliably quantified using this system. Time constraints precluded testing of the dilution and Perma-Pure systems shown in Figure 2.

3.1.2 Analytical System and Procedures

The FTIR equipment employed in this test consisted of a refractive scanning interferometer, a heated infrared absorption cell, a liquid nitrogen cooled mercury cadmium telluride (MCT) broad band infrared detector, and a computer. The interferometer, detector, and computer were purchased from KVB/Analect, Inc., and comprise their base Model RFX-40 system. The nominal spectral resolution of the system is one wavenumber (1 cm^{-1}). Sample was contained in a variable path white cell, model 5-22 H, manufactured by Infrared Analysis, Inc. Heated jackets and temperature controllers were used to maintain a cell temperature of 115°C (240°F). The absorption path length was externally adjustable from 2.2 to 24.2 meters. For the validation, a path length of 22 meters was used. The pathlength was determined by visual inspection of the number of optical passes of the infrared radiation within the cell, using a co-linear white light source mounted at the interferometer output flange. The pathlength was verified by inspection of a 100 ppm ethylene calibration transfer standard (CTS) gas and comparisons with similar spectra recorded along with the reference spectra used in the quantitative analysis (see also Section 4.3). Additional details regarding the testing and analytical procedures are found in Sections 4 and 5. Standard gas analyzers were operated to provide dry basis concentration measurements of oxygen (O_2), carbon monoxide (CO), and carbon dioxide (CO_2) from a portion of the condenser sample stream, which was split off at the condenser outlet. The O_2 content of the gas stream was determined using a Teledyne Model 320P-4 analyzer with a patented micro-fuel cell. A Thermo Environmental Instruments Model 48 CO analyzer employing gas filter correlation (GFC) was used to measure CO by infrared (IR) absorption. To measure the CO_2 concentrations, a Fuji Model 3300 CO₂ non-dispersive infrared (NDIR) analyzer was used. A Ratfisch Model RS255CA was employed to measure the total hydrocarbon content in the "hot/wet" stream, a portion of which was split off at the outlet of the heated manifold for this purpose. All the analyzers were calibrated at the beginning and end of each test period using EPA Protocol 1 certified gas blends. Propane in air was used to calibrate the Ratfisch instrument.

Measurements provided by the analyzers were averaged over the time periods when direct gas extraction sampling was conducted. Sample concentration sampling was conducted concurrently with direct gas extraction testing.

3.2 SAMPLE CONCENTRATION

Sample concentration was performed using the adsorption/thermal desorption technique described immediately below in Sections 3.2.1 and 3.2.2. Four gas samples were collected simultaneously during sample concentration each run using a quadruplicate ("quad-") train assembly. A single sampling train is depicted in Figure 3.

3.2.1 Sampling System and Procedures

Components of a single sampling train include a heated stainless steel probe, heated filter and glass casing, heated teflon connecting line, an optional stainless steel air-cooled condenser coil, stainless steel adsorbent trap in an ice bath, two water-filled impingers followed by an empty knock-out impinger, an impinger filled with silica gel, a sample pump, and a dry gas meter. The air-cooled condenser coil was found to be unnecessary during this test, and was not employed. All heated components were kept at a temperature above 120°C to ensure no condensation of water vapor within the system. The sorbent trap was a specially designed stainless steel U-shaped collection tube filled with 10 grams of Tenax sorbent and plugged at both ends with glass wool. Stainless steel was used for the construction of the adsorbent tubes because it gives a more uniform and more efficient heat transfer than glass; this is an important consideration, since maintenance of the Tenax temperature is important during both the sampling and thermal desorption steps of the technique.

Sampling was conducted at approximately 3.1 to 4.2 liters per minute (0.10 to 0.15 standard cubic feet per minute for collection times of approximately 90 minutes. The sampling rate was close to the maximum that could be achieved with the sampling system and the collection time was chosen to provide a total sampled gas volume of 280 liters (10 standard cubic feet). Sampling a larger volume is possible, but the time required would have been prohibitive for this test. The spike gas flow rate, controlled by a needle valve upstream of the mass flow meter, was chosen to provide concentrations of approximately 500 ppb, for each spike compound, in the front half of the heated filter. Exact spike loadings were calculated from the constant spike flow rate and other parameters described in Section 5.1. Prior to and following performance of the tests, the mass flow meters were calibrated against standard dry gas meters at various flow rates, ambient temperatures, and delivery pressures. These devices were found to be extremely accurate ($\pm 1\%$ total integrated flow) and stable under all conditions.

Before the Tenax adsorbent packed in the sample tubes was used, the following cleaning procedures were employed to remove any impurities that might desorb along with the sample compounds collected. The packed tube was heated to 350°C while being purged with preheated nitrogen at 1 to 2 lpm. The heating and nitrogen flow were maintained for up to 18 hours. Cleaning the desorption tubes resulted in a decrease in impurity-related bands that Entropy has observed in spectra from the desorption of new, commercially precleaned Tenax. However, contaminants from other sources did affect the test procedures and results, as described in Section 6.4.4.

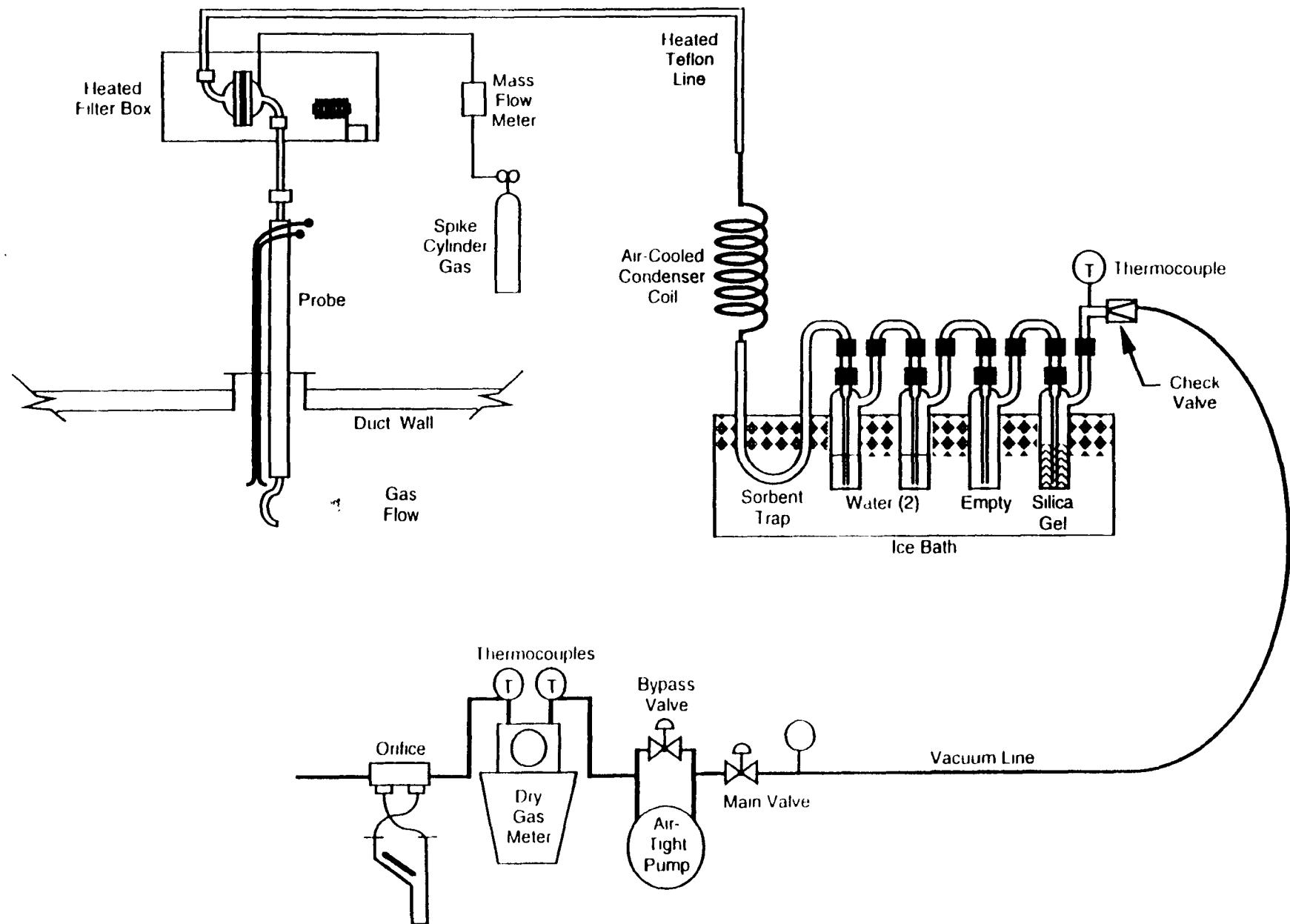


Figure 3. Sample concentration system

3.2.2 Analytical System and Procedures

After each sample was collected, condensed water was removed from the sample tube. This was accomplished by immersing the tube in an ice bath and purging it with dry nitrogen for eight minutes. The compounds collected on the Tenax were then recovered and analyzed as follows. Each tube was separately wrapped with heat tape and placed in a heating chamber. One end of the sample tube was connected to a line leading to the inlet of the evacuated FTIR absorption cell. Gas samples were desorbed from the Tenax by heating the tube to 250°C, then purging the tube contents into the FTIR absorption cell with a preheated stream of UPC grade nitrogen gas. The purge was continued until the cell pressure reached one atmosphere, which required 8.5 liters of nitrogen. The infrared absorption spectrum of the desorbed gas was then recorded. The cell was then evacuated, and the purging process was repeated. The infrared spectrum of the gas resulting from the second purge was examined to verify that no infrared-absorbing compounds remained on the Tenax after the first purge. Additional details regarding the testing and analytical procedures are found in Section 4 and Section 5.

4.0 TESTING PROCEDURES

At the baghouse outlet location described in Section 2.0, some or all of the following testing procedures were performed. The duration and exact nature of each procedure depended on the characteristics of the gas stream and the observed equipment performance.

4.1 SET UP PROCEDURES

The gas phase extractive probe and/or quad-train assembly was installed at the baghouse outlet sampling location. Temperature and leak checks of all sampling, conditioning, and FTIR analytical systems were performed.

The CO, CO₂, O₂, and hydrocarbon analyzers were calibrated according to standard EPA test procedures using EPA Protocol 1 calibration gases and procedures similar to those described in EPA Methods 3A, 10, and 25A. The FTIR system was prepared at 22 meter path length.

Flue gas volumetric flow rate was determined prior to each testing run according to an EPA Method 2 traverse and the diluent measurement data provided by the CO₂ and O₂ analyzers. Pitot tube traverses were performed periodically at one port location and compared to the Method 2 data. No significant variation of the flow was observed over the test period.

4.2 SAMPLING PROCEDURES

The sampling and spiking procedures described below were conceived to allow cost-effective validation of the two FTIR analytical methods for as many gaseous HAP compounds as possible. Sampling methods were adapted from the Analyte Spiking procedures described in EPA Method 301, Section 5.3. Performing the described analyte spiking procedures into a gas stream requires a relatively large volume of well-characterized gas standards, which are available and practical for field use only in high pressure gas cylinders. Consultations were held with the Research Division of Scott Specialty Gases, Inc. to determine the appropriate gas mixtures. Both sample stability and spectroscopic compatibility were considered in selecting the sets of compounds to be included in each cylinder. The cylinder gases are further described and listed below in Section 4.4. Adaptations of Method 301 procedures used in this test are described below for each sampling technique.

4.2.1 Direct Gas Extraction

Because only one complete FTIR system was available for the test, it was not possible to conduct simultaneous sampling using the direct gas extraction system. Instead, the required 24 samples (12 spiked and 12 unspiked) were collected sequentially for each of the 11 spike cylinder mixtures tested. The derived precision of the measurements provided by the technique therefore differs from that intended by Method 301, in that it contains contributions from any variation in the source emission. The criteria pollutant CEM instruments were monitored carefully during each set

of runs, and indicated extremely stable plant operation over the entire test period.

Nearly complete sets of "hot/wet" and condenser samples were obtained during the test. Separate extractions of flue gas were introduced to the FTIR cell approximately every five minutes. Data were collected in groups of four consecutive unspiked spectra followed by four spiked samples. Alternate groups of four samples were extracted until the complete set of 24 spectra was obtained. Collection of these 12 spiked/unspiked sample pairs required approximately 3½ hours. Samples that were compared for statistical tests were separated in time by about ½ hour. Because of low delivery pressure and/or equipment problems encountered during the test, two cylinders were emptied before complete sets of 12 spiked/unspiked sample pair could be collected; incomplete sets of data were obtained for cylinders #7 (8 pairs) and #8 (6 pairs) spiked into the condenser system. Because of a procedural error which was not discovered until after the testing was completed, only five pairs of samples were obtained for the hot/wet system spiked with cylinder #4 compounds.

4.2.2 Sample Concentration

EPA Method 301, without the adaptation discussed above for the direct gas extraction system, served as a basis in planning the tests of the sample concentration technique. However, because of contamination found in the first sets of samples (see Section 6.4.4), it was necessary to limit the number of spiking analytes and/or sampling runs in order to complete the testing with the available on-site time. The number of runs permitted by these constraints was less in all cases than specified by the test protocol. The schedule was adjusted during the test to provide the maximum possible amount of information on the compounds of interest, by trading off a lower number of sample runs for an increase in the number of compounds included in the test.

The concentration samples were collected independently of the direct gas extraction samples. Single runs consisted of sampling 280 liters (10 ft³) of flue gas simultaneously through the four Tenax cartridges included quad-train. It was possible to complete two and sometimes three sampling runs in a single day. The charged sample tubes were stored on ice until the desorption step was completed the same evening. Desorptions were carried out according to the procedures described in Section 3.2.

4.3 RECORDING OF INFRARED SPECTRA

As specified in the FTIR Protocol, a spectrum of a CTS gas (100 ppm ethylene in nitrogen) was recorded before and after each testing session to check the FTIR spectrometer performance. The infrared spectrum of a gaseous compound consists of characteristic patterns of lines representing a measure of fundamental structural properties, and provides a unique "fingerprint" of the absorbing compound. Band intensities vary with concentration, making it possible to use reference spectra, obtained earlier in the laboratory, to quantify any compounds detected. However, line shapes and intensities are also influenced by instrumental factors such as gas temperature, absorption pathlength, detector response, source

intensity, interferometer servo performance, and choices of optical retardation and apodization functions. The CTS spectra collected at the test site were compared to spectra of the same CTS gas, collected concurrently with the quantitative reference spectra. This comparison allows the operator to detect any instrument malfunctions and, in most instances, quantitatively account for spectral differences which related to optical retardation, pathlength and temperature variations.

All spectra were recorded at a nominal resolution of 1 cm^{-1} . The absorption cell was configured to allow 40 passes of the infrared beam to traverse the cell between the entrance and exit windows. This is equivalent to a path length of 22 meters as measured by comparing the CTS spectra to some collected earlier in the laboratory at a known (shorter) path length.

Absorbance spectra were each composed of two "single beam" spectra. First, a background of the evacuated cell was collected and processed. The background gave an indication of the infrared transmission characteristics of the system and the frequency dependent sensitivity of the detector. The cell was then pressurized and a sample spectrum collected. The "single beam" sample spectrum was divided point by point by the background of the evacuated cell to give a transmittance spectrum. This removed any effects resulting from wavelength dependent transmission losses through the instrumental system. The transmittance file was then converted to absorbance for use in the subsequent analyses. To provide adequate signal-to-noise (S/N), 50 sample scans were divided by a 200 scan background. A sample absorbance spectrum could be obtained in about three minutes. Repeated treatment with wet samples can degrade the transmission characteristics of the KBr cell windows. This necessitated periodic collection of a new background spectrum to ensure a good baseline.

4.4 DYNAMIC SPIKING

Within the time and resource constraints of the test program, Entropy conducted dynamic analyte spiking according to the procedures described in the document "Protocol for FTIR Field Validation." Prior to performance of the test, the procedures described in this document were adapted from those of Method 301 to accommodate the techniques of interest, and depart from Method 301 in two basic ways. First, the spiking was performed dynamically, that is, the spike materials were added to the gas stream as it was collected. In contrast, Method 301 assumes that a collection medium is available for (static) addition of the spike compounds prior to the collection of samples. The dynamic method employed in this test meets the Method 301 requirement that the spike be introduced as close as possible to the probe tip, and is more convincing than the static method in that most elements of the sampling system apparatus are simultaneously exposed to the spike materials and stack gas over the same period of time. Second, the direct gas extraction samples were obtained sequentially (rather than simultaneously), since only one complete FTIR system (rather than the four required for simultaneous spiking) was available for the test. As discussed above, the derived precision of the technique therefore contains contributions from any variation in the source emission levels which occur during performance of the spiking procedures.

Cylinder gas standards, each containing up to five HAP's at concentrations of 50 ppm (in nitrogen) were prepared for Entropy by Scott Specialty Gases. See Table 4-1 for a listing of the compounds in each cylinder, which were grouped according to vapor pressure, stability, and spectroscopic compatibility. Note that many HAP compounds cannot be stabilized in cylinders at useful (greater than 300 psig) delivery pressures, and were therefore excluded from this test. A "tracer" of 1 ppm sulfur hexafluoride (SF_6) was also included in each cylinder, and was used to verify the spike compound concentrations in the direct gas extraction samples (see Section 4.4.1).

4.4.1 Direct Gas Extraction

The components used to deliver the spike gas to the direct gas extraction sampling system were a mass flow meter and heated Teflon® line. The mass flow meter provided a measure of spike gas flow to the sampling system. The heated Teflon® line was used to heat the cylinder gas to approximately the flue gas sample temperature to avoid condensing water vapor in the sample gas. The heated spike gas was introduced to the sampling system at a "tee" located between the sample probe outlet and inlet to the Balston filter (see Figure 2 in Section 3.1.1). From this point, the spike and sample gas mixture were transported through the remaining portions of the sampling system described in Section 3.1. An orifice located at the outlet of the secondary particulate filter within the heated manifold inside the FTIR truck provided a known total flow of the sample. A spike dilution factor of five was achieved by maintaining the spike flow at the mass flow meter at exactly one quarter of the total flow.

Spike flow ratios were verified in two ways. First, CTS gas (100 ppm ethylene in nitrogen) was introduced through the mass flow meter and spike line to the gas sampling system. This was done prior to insertion of the probe in the sample port so that the CTS spike was mixed with ambient air. Standard analysis programs (similar to those described in Section 5) were used in the field to determine the concentration of ethylene in the resulting sample, and in all cases verified the flow-determined dilution ratio to within five percent. Another method of verification was also employed in the field, in which spectra of the spiked samples were periodically analyzed for the concentration of SF_6 . The diluted SF_6 tracer contained in each spiked sample was shown in every case to be the expected 0.200 ± 0.020 ppm.

4.4.2 Concentrated Samples

Spike gases were introduced to the appropriate sample concentration trains through mass flow meters. The measured flow of gas was passed through a pre-heater coil and then introduced to the sample system at the inlet to the Method 5 particulate filter. The combined stream travelled through the cooled collection tube where compounds could be adsorbed onto the Tenax. The total gas flow was measured with the dry gas meter. Spiking rates were chosen to provide gas concentrations of concentrations of approximately 500 ppb in the adsorbed, and yielded post-desorption concentrations of approximately 20 ppm in the FTIR cell (for compounds with

high adsorption and desorption efficiencies). Highly volatile pollutants such as the SF₆ tracer gas do not adsorb well on Tenax, and this compound was not detected in the concentrated, desorbed samples. Consequently, the SF₆ tracer could not be used to provide a check of the spiking rate (as described above for the direct gas extraction tests). The expected spike concentrations for these samples were derived from the standard concentrations, flow meter readings, spike gas flow time, and total sample gas volumes (see Section 5.1.2).

Table 4-1. Spike Compounds and Cylinder Groupings

Cyl #	Compound	Compound #
1	Acrolein	306
	Carbonyl Sulfide	030
	Chlorobenzene	037
	1,1,2-Trichloroethane	159
	Vinyl Chloride	168
2	n-Hexane	095
	Methylene Chloride	117
	Propylene Oxide	143
	Vinyl Acetate	166
	p-Xylene	173
3	Methyl Chloride	107
	Vinyl Bromide	167
	Acetone	192
4	Bromoform	322
	Carbon Tetrachloride	329
	Carbon Disulfide	328
	2,2,4-Trimethylpentane	165
	m-Xylene	172
5	Ethylene Dibromide	380
	Methyl Ethyl Ketone	109
	Toluene	153
	Vinyldene Chloride	169
6	Ethyl Chloride	079
	Methyl Bromide	106
	Methyl Iodide	111
	Methyl Methacrylate	114
7	Acrylonitrile	009
	Allyl Chloride	010
	Ethyl Benzene	077
	o-Xylene	171
8	Acetonitrile	003
	Benzene	015
	Methanol	104
	Methyl Isobutyl Ketone	112
	Tetrachloroethylene	151
9	Chloroform	039
	Cumene	046
	Ethylene Oxide	084
	1,2-Epoxy Butane	075
	Methyl t-Butyl Ether	115
11	1,3-Butadiene	023
	Propylene Dichloride	142
	Styrene	147
	Trichloroethylene	160
12	Ethylene Dibromide	080
	Methyl Chloroform	108
	2-Nitropropane	124

5.0 ANALYSIS PROCEDURES

The goals of the field test described here are the characterization of bias, precision, and range of the FTIR technique in conjunction with three sampling systems. EPA Method 301, which allows the use of spiking or comparisons to a validated test method, was taken as the basis for calculation of these quantities; it specifies the comparison of analytical results for samples containing a known amount of spike material to the results for samples containing no spike material. The spiking procedures and associated statistical treatment of the analytical results via Method 301 replace several of the calculational methods prescribed in the FTIR Protocol. Some departures from the standard Method 301 testing procedures were adopted for this test, mainly because the requirement of simultaneous, quadruplicate sample collection is impractical for the direct gas extraction method. A sequential testing procedure, in which source variations are subsumed in the method's derived precision, was adopted as an alternative for this test. The procedures are described in a document entitled "Protocol for FTIR Field Validation," which was developed by Entropy and submitted to EMB with the site specific test plan for this test.

When Method 301 is not employed, recommended alternate methods for FTIR analysis of stack effluent are described in detail in the "Protocol for Applying FTIR Spectrometry in Emission Testing" (hereafter, the "FTIR Protocol"), which was developed by Entropy under EPA contract. The procedures of the FTIR Protocol were employed to generate and characterize the sample and reference spectra on which the quantitative spectral analyses are based; these characterizations are described in detail above and in reports previously submitted to EMB by Entropy. Most other data analysis procedures of the FTIR Protocol are intended to provide estimates of measurement uncertainties from various instrumental and analytical effects. An example of such an quantity is the "Fractional Reproducibility Uncertainty" (FCU), which provides a measure of the analytical uncertainty related to the reproducibility of the spectral data through repeated application of a "calibration transfer standard" gas. Because the calculations performed in this work are based on the final HAP concentrations, this and other errors are included in the statistically determined measurement uncertainties required by Method 301 (see Section 5.3.1), and are not addressed in this report.

5.1 CALCULATION OF EXPECTED SPIKE COMPOUND CONCENTRATIONS

As described in Section 4.0, cylinders containing known concentrations (approximately 50 ppm in all cases) of HAP compounds in nitrogen were introduced into one half of the samples to be analyzed.

It should be noted that no spectroscopic evidence of any of the spike compounds was found in the samples which were unspiked. The expected concentration for all HAP's in unspiked samples was accordingly taken as zero for the purposes of the statistical calculations prescribed in Method 301. Implications of this procedure are addressed in Sections 5.0 and 6.0.

5.1.1 Expected Concentrations in Spiked Gas Phase Samples

Expected concentrations of HAP spike materials in gas phase samples were calculated on the basis of flow rates measured during the field test. These flow rates were constantly maintained during the performance of the field testing for each HAP spiking group, and were verified to within $\pm 10\%$ by spectroscopic analysis for the 1 ppm SF₆ tracer gas component in each cylinder.

The value for the expected concentration from the gas phase sampling is given by

$$C_{exp} = \left(\frac{Flow_{spike}}{Flow_{total}} \right) \times (C_{cyl})$$

where:

C_{exp} is the expected gas spike concentration.

$Flow_{spike}$ is the measured flow rate for the spike gas.

$Flow_{total}$ is the measured flow rate for the spike gas plus the stack gas.

C_{cyl} is the cylinder concentration of the spike compound.

5.1.2 Expected Concentrations in Spiked, Concentrated Samples

Expected concentrations of HAP spike materials in concentrated samples were calculated on the basis of spike flow rates and total gas sample volumes measured during each run of the field test. These quantities were not always the same for each run involving a spiking compound group, and also varied for the two spiked sampling trains within each run. To allow use of the Method 301 statistical tests, it was necessary introduce scaling factors designed to yield equal expected concentrations for all the trains and runs. These factors were taken into account in corrections to the observed spike concentrations (see Section 5.2.3).

The expected concentration in the sample concentration system is calculated in two steps. The first equation determines the amount of spike gas that is placed on the Tenax. It is given by

$$Vol_{spike} = (T_{spike}) \times \left(50 \frac{cc}{min} \right) \times \left(\frac{L}{1000cc} \right)$$

where:

V_{spike} is the volume (in liters) of the spike gas flowed through the sampling system.

T_{spike} is the length of time for sampling.

The value of 50 cc/min was the spike gas flow rate into the sample concentration system.

The expected concentration is then given by

$$C_{\text{exp}} = \left(\frac{V_{\text{spike}}}{8.0 \text{ L}} \right) \times (C_{\text{cyl}})$$

where:

C_{exp} is the expected concentration.

C_{cyl} is the cylinder concentration of the spike gas.

8.0 liters is the volume of the FTIR cell.

5.2 CALCULATION OF OBSERVED SPIKE COMPOUND CONCENTRATIONS

The reported values were calculated using the Multicomp program (Version 6), which is part of the KVB/Analect FX-70 software package. This program utilizes a calibration matrix created from a set of reference spectra. The program was employed to characterize the relation between known and calculated absorbance values of the reference spectra via least squares methods. The resulting matrix was then used to determine concentrations in the unknown mixtures.

5.2.1 Description of K-Matrix Analyses

K-type calibration matrices were used to relate absorbance to concentration. Several descriptions of this analytical technique can be found in the literature². The discussion presented here follows that of Haaland, Easterling, and Vopicka³.

For a set of m absorbance reference spectra of q different compounds over n data points (corresponding to the discrete infrared wavenumber positions chosen as the analytical region) at a fixed absorption pathlength b , Beer's law can be written in matrix form as

$$\mathbf{A} = \mathbf{KC} + \mathbf{E}$$

where:

A is the $n \times m$ matrix representing the absorbance values of the m reference spectra over the n wavenumber positions, containing contributions from all or some of the q components;

K is the n by q matrix representing the relationship between absorbance and concentration for the compounds in the wavenumber region(s) of interest, as represented in the reference spectra. The matrix element $K_{nq} = ba_{nq}$, where a_{nq} is the absorptivity of the q th compound at the n th wavenumber position;

C is the $q \times m$ matrix containing the concentrations of the q compounds in the m reference spectra;

E is the $n \times m$ matrix representing the random "errors" in Beer's law for the analysis; these errors are not actually due to a failure of Beer's law, but actually arise from factors such as misrepresentation (instrumental distortion) of the absorbance values of the reference spectra, or inaccuracies in the reference spectrum concentrations.

The quantity which is sought in the design of this analysis is the matrix K , since if an approximation to this matrix, denoted by \underline{K} , can be found, the concentrations in a sample spectrum can also be estimated. Using the vector A^* to represent the n measured absorbance values of a sample spectrum over the wavenumber region(s) of interest, and the vector \underline{C} to represent the j estimated concentrations of the compounds comprising the sample, \underline{C} can be calculated from A^* and \underline{K} from the relation

$$\underline{C} = [\underline{K}^t \underline{K}]^{-1} \underline{K}^t A^* .$$

Here the superscript t represents the transpose of the indicated matrix, and the superscript -1 represents the matrix inverse.

The standard method for obtaining the best estimate K is to minimize the square of the error terms represented by the matrix E . The equation

$$\underline{K} = A C^t [C C^t]^{-1}$$

represents the estimate \underline{K} which minimizes the analysis error.

Reference spectra for the K -matrix concentration determinations were de-resolved to 1.0 cm^{-1} resolution from existing 0.25 cm^{-1} resolution reference spectra. This was accomplished by truncating and re-apodizing the interferograms of single beam reference spectra and the corresponding background interferograms. The processed single beam spectra were recombined and converted to absorbance (see Section 4.3).

5.2.2 Preparation of Analysis Programs

To provide accurate quantitative results, K-matrix input must include absorbance values from a set of reference spectra which, added together, qualitatively resemble the appearance of the sample spectra. For this reason, all of the Multicomp analysis files included spectra representing interferant species and criteria pollutants present in the flue gas in addition to de-resolved reference spectra of HAP's used for analyte spiking experiments.

A number of factors affect the detection and analysis of a spiked analyte in the stack gas matrix. One factor is the composition of the stack gas. The major spectral interferants in the coal-fired boiler effluent are water and CO₂. At CO₂ concentrations of about 10 percent and higher, weak absorption bands that are normally not visible begin to emerge. Some portions of the FTIR spectrum are not available for analysis because of extreme absorbance levels of water and CO₂, but most compounds exhibit at least one absorbance band that is suitable for analysis. A second factor affecting the analysis is the number of analytes that are to be detected. The gas cylinder spiking mixtures were prepared with 3 to 5 compounds each so that spectrum would not become overly complicated. Even so, this means that a spiked sample contained up to 13 compounds including HAP's, interferant species, and criteria pollutants that were present in the flue gas.

A set of Multicomp program files was prepared for each of 11 cylinder mixtures with a separate file for quantifying each compound (47 files total). Four baseline subtraction points are specified for each analytical region, identifying an upper and a lower baseline averaging range. The absorbance data in each range were averaged, a straight baseline was calculated through the range midpoint using the average absorbance values, and the baseline was subtracted from the data prior to K-matrix analysis.

Within a cylinder group, all of the files contained the same set of reference spectra, which represented the compounds listed under each group. Program files within a grouping differed only by the analytical region(s) and baseline subtraction techniques specified in the file input. In addition, every file used for gas phase analysis contained spectra of sulfur dioxide (SO₂), carbon dioxide (CO₂, 10 to 15 percent), water (approximately 5 percent by volume), and carbon monoxide (CO). It was also necessary to include nitric oxide (NO) and nitrogen dioxide (NO₂) in some of the files. NO was not, in general, an important spectral interferant, but in cases where the analytical region included frequencies near 2900 cm⁻¹ it was necessary to account for NO₂, especially in spectra of condenser samples. The sample concentration spectra contained water and small amounts of CO₂. In addition to the interferants mentioned, hydrogen chloride (HCl) was present in the stack matrix. Concentrations of interferant species remained relatively constant during the testing, but the concentration of HCl varied by as much as 70 percent below its maximum concentration.

Prior to the actual field test, synthetic spectra were prepared using sample spectra that had been obtained during previous testing at a coal-fired boiler. K-matrix programs were then constructed which could adequately analyze the synthetic spectra. These analysis programs were found to serve as a useful starting point; all the finalized Multicomp routines are based on the programs prepared using the synthetic spectra.

Preparation of the synthetic spectra proceeded in the following stages. First, Entropy obtained a 1 cm⁻¹ reference spectrum of each cylinder mixture to be used in the analyte spiking experiments. Second, the cylinder spectra were scaled by a factor of 0.2 to simulate the anticipated dilution. Finally, a computer generated synthetic spectrum was created by adding a scaled cylinder spectrum to each of several sample spectra from the coal-fired boiler. This resulted in a set of synthetic spectra (for both "hot/wet" and condenser samples) representing simulated spiked samples in a stack matrix similar to what would be encountered during the validation testing.

5.2.3 Concentration Correction Factors

Calculated concentrations in sample spectra were corrected for differences in absorption pathlength between the reference and sample spectra according to the following relation:

$$C_{corr} = \left(\frac{L_r}{L_s} \right) \times \left(\frac{T_s}{T_r} \right) \times (C_{calc})$$

where

C_{corr} is the pathlength corrected concentration.

C_{calc} is the initial calculated concentration (output of the Multicomp program designed for the compound)

L_r is the pathlength (3m) associated with the reference spectra.

L_s is the pathlength (22m) associated with the sample spectra.

T_s is the absolute temperature of the sample gas (388 K).

T_r is the absolute gas temperature at which reference spectra were recorded (300 to 373 K).

In addition to the pathlength and temperature corrections, the sample concentration values were corrected for the different expected concentrations. This adjustment was due to the different amounts of spike gas that were applied to the sample concentration system. All of the expected values were normalized to values of 20 ppm; in addition, all of the calculated concentration values were also normalized in the same manner as the expected values. The normalization factor is given by

$$C_{\text{norm}} = \left(\frac{20}{C_{\text{exp}}} \right) \times (C_{\text{corr}})$$

where

C_{norm} is the normalized calculated concentration value.

C_{exp} is the expected concentration of the spike compound.

C_{corr} is the pathlength adjusted value that was determined previously.

Corrections for variation in sample pressure were considered, and found to affect the indicated HAP concentrations by no more than one to two percent. Since this is a small effect in comparison to other sources of analytical error identified in this study, no sample pressure corrections were made.

The term "observed concentration" is used hereafter to indicate either the corrected concentration C_{corr} (in the case of direct gas extraction measurements) or the normalized concentration C_{norm} (in the case of concentrated sample measurements).

5.3 COMPARISONS OF EXPECTED AND OBSERVED SPIKED COMPOUND CONCENTRATIONS

During collection of both the concentrated and direct gas extraction samples, the analyte spiking validation procedures specified in EPA Method 301, Section 6.3 were followed as closely as possible. According to Method 301, half of the samples must be spiked and the other half remain unspiked. The precision and the bias of the measurement system are calculated via statistical comparisons these spiked and unspiked data.

5.3.1 Precision

The precision of the measurement system (sampling and analytical) is measured as the relative standard deviation (RSD) presented as a percentage. The RSD determines the "size" of the sample standard deviation relative to the sample mean. The RSD was calculated for both the spiked and unspiked samples using the following procedures:

- a. The differences, d , between the observed and expected concentrations of the spiked pairs ("spiked differences") and the unspiked pairs ("unspiked differences") were calculated separately. Then the standard deviations of the spiked differences and unspiked differences were formed using the following equations:

$$SD_s = \sqrt{\frac{\sum_{i=1}^n d_i^2}{2n}}$$

$$SD_u = \sqrt{\frac{\sum_{i=1}^n d_i^2}{2n}}$$

where:

SD_s = standard deviation of the spiked differences
 SD_u = standard deviation of the unspiked differences
 n = number of paired samples

b. The relative standard deviation was determined as follows:

$$RSD = \left(\frac{SD}{S_{ms}} \right) \times 100$$

$$RSD = \left(\frac{SD}{S_{mu}} \right) \times 100$$

where:

S_{ms} = mean of the observed spiked sample concentrations
 S_{mu} = mean of the observed unspiked sample concentrations

If the RSD \leq 50 percent for both the spiked and unspiked samples, the precision was considered acceptable.

5.3.2 Bias

The bias is a measure of the systematic error inherent in the measurement system. The bias is the difference between the observed spiked value and the expected spiked value, including the difference from zero as measured by the unspiked value. Ideally, this difference will be zero. The bias was calculated as follows:

$$B = S_m - M_m - CS$$

where:

B = bias at the spike level
S_m = mean of the observed spiked sample concentrations
M_m = mean of the observed unspiked sample concentrations
CS = expected value of the spiked concentration.

Even if the bias is not zero, it may not be significantly different from zero. Statistical significance of the bias is determined by conducting a small sample hypothesis test of H₀: the bias is zero vs H_a: the bias is not zero, where H₀ is the null hypothesis and H_a is the alternative hypothesis. A small sample test statistic, t, is calculated from the data and compared to the tabulated t value which comprises the lower limit of the rejection region for H₀ at the 95% confidence level. If the calculated t statistic falls within the rejection region, the bias is statistically significant and a correction factor must be used for future testing. The statistical significance of the bias was determined as follows:

1. The standard deviation of the mean is calculated as follows:

$$SD_m = \sqrt{SD_s^2 + SD_{\bar{x}}^2}$$

2. The t-statistic was determined by:

$$t = \frac{|B|}{SD_m}$$

The bias is considered significant if the t-statistic is greater than the critical value of the two-sided t-distribution at the 95 percent confidence level and n-1 degrees of freedom.

If the bias is statistically significant, a correction factor (CF) must be calculated as follows:

$$CF = \frac{1}{1 + \frac{B}{CS}} = \frac{CS}{S_m - M_m}$$

For the method to be acceptable, CF must be between 0.70 and 1.30.

6.0 RESULTS AND DISCUSSION

The spectral analysis programs (Section 5.2.2) were applied to all sample spectra, and the resulting concentration values were corrected (Section 5.2.3). All spectra were visually compared to spectra of the spike cylinder gases to ensure that the resulting concentrations were physically reasonable and that no obvious spectral interferants had been omitted from the analytical programs. Statistical analysis of the data was carried out (Section 5.3), and compounds were classified as "validated" if they met the following criteria:

- The relative standard deviations for both the spiked and unspiked series of spectra were less than 50 percent.
- The t-value determined for the data was less than that for the appropriate number of degrees of freedom at the 95 percent confidence level.
- If the bias was statistically significant, then a multiplicative correction factor was determined, and found to between 0.70 and 1.30.

Spectra and analytical programs involving compounds for which the above criteria were not immediately met were subject to further scrutiny. In many cases, improvements in the analytical results were achieved by adjustment of the spectral region and/or baseline subtraction technique employed in the Multicomp program. Following these adjustments, the statistical analysis was repeated. Many compounds which did not initially pass the specified tests were re-classified as "validated" following such correction of the programs.

For clarity, all tables associated with and described in this section have been placed at the end of this report (following Section 8.0).

6.1 COMPOUNDS WHICH MEET VALIDATION CRITERIA

The following sections present results and analytical details concerning those compounds for which the statistical data quality criteria listed above were met, for each of the three sampling systems investigated.

Tables 6-1 and 6-2 summarize the compound/sampling pairs for which valid analytical programs could be devised, for the hot/wet, condenser, and concentrated samples. The number of samples is not always the 24 required by Method 301, but is sometimes lower because of procedural difficulties or time and material constraints (see Section 6.4.3). However, the statistical tests were carried out taking the number of samples into account. Several compounds (notably numbers 159 and 165 in the hot/wet samples) exhibit mean unspiked values which vary significantly from zero, but still meet the Method 301 criteria for analyte spiking. This is because the difference between the spiked and unspiked concentrations, rather than their absolute values, are used in all the statistical tests. Analytically, this effect is due slight errors in the choice of points used

for baseline subtraction in the Multicomp programs. The statistical results indicate that the results of the programs are accurate when corrected for these offsets, and that the offsets could be removed by adjustment of the baseline subtraction routines. These testing procedures for these compounds are listed as having met the Method 301 criteria, but are not counted as "valid" in the totals presented in Section 7.0

Tables 6-3 through 6-5 present detailed analytical results for each compound in the hot/wet samples, condenser samples, and concentrated samples, respectively. Each entry in these Tables provides the observed concentrations for the spiked and unspiked samples and the statistical quantities defined in Section 5.3. Table 6-6 presents the reference spectral files, associated concentrations, analytical regions, and baseline correction details for the Multicomp programs employed in the calculation of the observed concentration of the indicated compound in each type of sample. Each page of the Table pertains to a particular compound/sampling system combination, and appears in the same order as the information of Tables 6-3 through 6-5.

6.2 COMPOUNDS WHICH DO NOT MEET VALIDATION CRITERIA

Tables 6-7 through 6-9 list the statistical details for those spike compounds for which the required data quality criteria were not met. For brevity, details of the associated Multicomp analyses are not provided in this report.

6.3 CEM AND FLOW DATA

Data from the CEM analyzers were compiled once per second by the associated data acquisition system, then combined to provide one-minute average values. Table 6-10 summarizes the average concentration measurements collected over each sample run period. The shaded areas within the Table represent time periods over which the sample was spiked with cylinder gases containing HAP compounds; analyzer values during these spiking periods are biased by the presence of the cylinder gas, and are therefore not presented. The CO, CO₂, and O₂ data are dry basis measurements because the sample provided to these analyzers was passed through the condenser system before being introduced to the instruments.

Sample gas analyzed by the THC instrument bypassed the condenser; these measurements were identically zero for the entire test period, and are omitted from Table 6-10. Table 6-10 also presents the flue gas volumetric flow, which was determined for each set of cylinder gas spike runs (see Section 4.4.1). The water content and average delta p presented in the Table are the results of wet-bulb/dry-bulb measurements and velocity traverses conducted before each run. Averaged O₂ and CO₂ concentrations were coupled with the water and delta p values to calculate the flue gas flow rates.

6.4 DISCUSSION

Several generalizations may be concerning the failure of the three sample types (hot/wet, condenser, and concentration) and/or analytical techniques to meet the Method 301 validation criteria. The discussions below identify the compounds according to their identification number, which is listed with each entry in Tables 6-1 through 6-5, and in Tables 6-7 through 6-9.

6.4.1 Spectral Interferences and Large Sampling Losses

A number of compounds are simply not observable in the spectra of the direct gas samples delivered to the FTIR instrumentation. These include compounds 028, 084, 115, and 143 in the hot/wet samples, and compounds 084, 115, and 143 in the condenser samples. For these data, the calculated spiked and unspiked concentrations varied greatly from sample to sample, or differed only slightly for individual samples. These effects are probably caused by heavy spectral interference, losses in the sampling system, or a combination of both effects.

The concentrated sample spectra indicate that a number of the spike compounds are not efficiently delivered to the FTIR sample cell. There are several possible reasons for this effect. Compounds with low boiling points are probably not efficiently adsorbed by the Tenax trap, or are lost during the drying cycle; others are highly water soluble and are likely dissolved in the liquid formed in the trap, and subsequently lost in the drying process, rather than being adsorbed. Table 6-11 lists those compounds which were not detected after thermal desorption of spiked samples, along with their boiling points and solubilities in water. Table 6-12 presents the same information for those compounds which were detected. The trends noted above are clear from a comparison of these two lists of physical data.

Of the compounds which were detected in concentrated samples, and for which analytical programs were devised, several (numbers 010, 159, and 169), failed to meet the Method 301 criteria because of heavy losses in the sampling system or because of heavy spectral interferences.

6.4.2 Systematic Errors

There is statistical evidence that some compounds are consistently delivered by the sampling systems (the RSD values for the spiked samples are low) and are not subject to extreme spectral interferences (the RSD values for the unspiked samples are low), but the analytical results are consistently low (mean spiked value less than the expected value) or too high (mean spiked value greater than the expected value). In the hot/wet system, the spiked results are consistently low for compounds 029 and 108, and the spiked results are too high for compounds 039, 046, 077, 104, 106, 112, 171, and 172. In the condenser system, the spiked results are consistently low for compounds 003, 009, 028, 029, 108, and 115, and the spiked results are too high for compounds 039, 046, 168, 172, and 192. In the concentrated samples, the spiked results are consistently low for compounds 009, 029, 108, 112, and 166, and the spiked results are too high for compounds 022 and 159.

There are several possible systematic errors which could lead to such results, including (1) errors in the reference spectrum gas concentration, spike cylinder gas concentration, or both; (2) band intensity mismatch between reference spectra and sample spectra, caused by instrumental distortion or gas temperature mismatch between reference and sample spectra; and (3) a consistent loss of a certain fraction of the spike concentration in the sampling system (although this impacts only those results for which the spiked values are lower than expected). Even when the techniques fail to meet the Method 301 criteria because of these effects, they may provide useful lower concentration limits (in those cases when the observed concentration is lower than expected) or upper concentration limits (in those cases when the observed concentration is higher than expected).

6.4.3 Statistical Issues

A fundamental question is posed by the fact that several compounds failed to meet the validation criteria solely because the mean of the observed values (S_{mu}) was close to zero, causing the RSD of the measurement to diverge and exceed the 50% limit. This effect is due only to the failure of the statistical tests when the observed unspiked concentration is nearly zero. It is well illustrated by the case of acrolein, compound number 006, when spiked into the condenser samples (although the compound did meet the validation criteria in the hot/wet samples). The average unspiked concentration was extremely close to zero for this set of measurements, with maximum deviations from zero equal to 0.69 and -0.30 ppm. However, the prescribed statistical analysis leads to an RSD value of 587% for this set of measurements, which is well outside the validation criteria. Note that if the average unspiked mean had been much greater in absolute magnitude than the actual value of 0.04 ppm, the analysis would have easily passed the RSD test.

For each sampling system, a number of compounds failed to meet the Method 301 criteria solely because of this effect. They are, for the hot/wet system, compounds 075, 111, 117, 147, 151, 153, and 192; for the condenser system compounds 006, 022, 030, 104, 111, 166, and 167; and for the concentrated samples, compounds 114 and 142.

Several compounds exhibited both this statistical problem and a correction factor (CF) outside the allowed range. The techniques may therefore also be suitable for determination of approximate concentrations or concentration limits (as discussed in Section 6.4.2) for several compounds. They are, in the condenser system, numbers 003, 009, and 039; in the concentrated samples, numbers 009, 022, 029, 112, and 159.

The number of samples collected in this test was lower than the 24 specified by Method 301 for all the sample concentration spike compounds and several of the direct gas spikes. Portions of the Method 301 calculations provide for including the number of samples in the set, including both the calculations of the standard deviations SD_s and SD_u and the test for significance of the bias, which determines whether or not the correction factor need be applied for a particular compound. As the number

of samples decreases from the prescribed twenty four, passing the RSD test becomes more difficult (requires higher precision of the measurements), but the bias is less often shown to be significant.

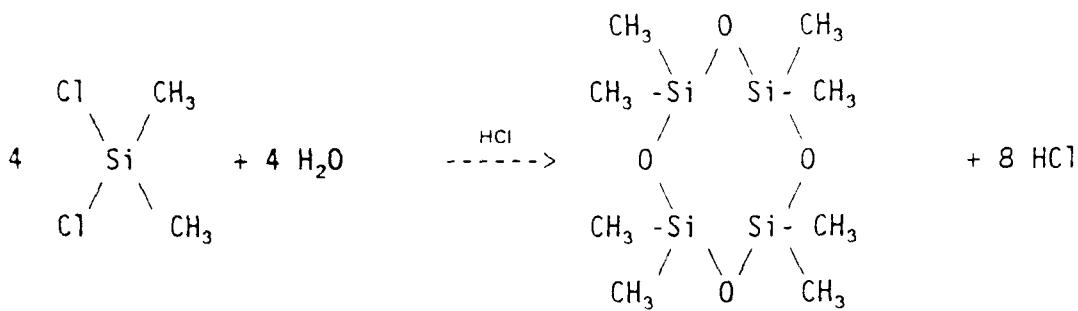
6.4.4 Contaminants

During the validation testing of the sample concentration method, problems were also encountered due to interference by a variety of contaminants that were collected, in addition to stack gas components and spike gas species, on the Tenax adsorbent. During sample analysis, these contaminants were desorbed along with the desired species, and the resulting infrared spectra showed absorbances due to both the contaminants and the expected species. The presence of these contaminants in the spectra proved to be a significant impediment to determining the concentrations of the spike gas species, as well as interfering with the collection of "clean" unspiked samples.

Entropy was able to identify the two most significant contaminants encountered in this study as well as their source in the sampling system. Future studies or validation tests will be able to avoid problems with these contaminants using the knowledge gained from the current work. Identification of these sources of contamination is also of importance for any workers using other sample concentration schemes, such as VOST and Semi-VOST, where similar contamination problems can potentially be experienced.

The first contaminant encountered during the validation process was residual mill oil on the stainless steel probe. This contaminant, identified as a long-chain alkane hydrocarbon ($\text{CH}_3(\text{CH}_2)_n\text{CH}_3$, $n > 10$) by its infrared spectrum, was observed only during the first two days of validation testing. New probes had been fabricated for this test, and the surfaces had been cleaned using solvent. It appeared this cleaning was not sufficient to remove all residual oil, in light of the high concentrations detected during the first two days of testing. The amount of oil varied considerably between the four probes used, indicating that all probes had not received equal cleaning. Validation testing utilized heated probes, and the heating process served to drive the oils off the hot metal surface and onto the Tenax adsorbent. The oil contaminant disappeared after two days, apparently because this provided sufficient time to remove all residual oil. This problem can be avoided in the future by requiring a more rigorous cleaning of new stainless steel tubing used for probes and pre-heating the probes for an extended period before use.

The second contaminant was also identified by its infrared spectrum, and was determined to result from a chemical reaction⁴ involving glass wool, which was initially used in place of the standard filter in the concentration sampling system. The glass wool (Altech) was silanized, that is, treated with dimethyl dichlorosilane ($\text{Si}(\text{CH}_3)_2(\text{Cl})_2$), to reduce its reactivity. The reaction product (octamethylcyclotetrasiloxane) results from a hydrolysis reaction between the water and dimethyl dichlorosilane in the presence of HCl:



While this cyclic siloxane was definitively identified in the infrared spectra, a search of the chemical literature was required to determine the mechanism of its formation. The appended reference list cites studies that describe the reaction shown above. Note that these references are primarily from foreign (Russian and German) sources, but the abstracts have been translated and provide the necessary information to identify the reaction.

This hydrolysis reaction is known to proceed under the conditions encountered in the sampling train used in the validation test. Here, the silanized glass wool was used as a filter material in the heated filter compartment between the probe and absorbent trap. Flow of hot stack gases through the filter allowed water to condense on the glass wool, and, in turn, HCl to dissolve in this condensed water. The references indicate the reaction is enhanced by the presence of dissolved HCl in the water and the elevated temperatures at which the glass wool was maintained. During the validation test, it was observed that the concentration of HCl was rather variable, and this variability seems to have also affected the concentration of the reaction product above. While the cyclic siloxane shown above is the main product, the reaction can also form a variety of other linear and cyclic siloxanes.

As stated earlier, the infrared spectra clearly showed the presence of the above cyclic siloxane, which was unambiguously identified using a spectra search library on the FTIR system. The remaining unidentified contaminants are probably other products of this reaction mechanism. Entropy was able to clearly identify the cyclic siloxane and the mill oil for two reasons. First, these species have quite distinct infrared spectra that permit identification using spectral search software. Second, the concentration of the different contaminants varied considerably during the testing, and some unspiked spectra were recorded that only contained a single contaminant. Indeed, Entropy was able to use and manipulate these spectra so they could be used as "reference" spectra in the mathematical multicomponent analysis.

The presence of the contaminants hampered the validation process for a number of reasons. Firstly, the mathematical analysis used to determine concentrations from an infrared spectrum (K matrix method) requires that the analyst have reference spectra for all species present in the analyzed spectral regions. Since the absorbances due to the contaminants often

overlapped those of the desired analytes, and no reference spectra were available for some of the contaminants, the accuracy of the mathematical analysis was impacted. Secondly, there were a number of different contaminants (at least four) which were present simultaneously and in varying relative concentrations. It should be noted that these concentrations varied even among the four trains of the quad-train in a given sampling run. Thirdly, at times the concentration of one or more contaminants was so high that it absolutely precluded analysis of the infrared spectrum. In these cases the contaminant absorbance overwhelmed that of any other species present.

The problems with sampling system contaminants experienced in the current study, and especially the identified contaminants and their sources within the sampling system, are significant for other emissions testing methods besides the sample concentration scheme utilized in the current study. Since water and HCl are commonly encountered in stack gas, and glass wool is commonly utilized in sampling systems, the reaction to form siloxanes may occur in a variety of other test methods. Likewise, contaminants like the residual mill oils on the heated probe can be present. The fact that these contaminants could be identified serves to reinforce some of the strengths of FTIR as a measurement technique. Future validation and screening tests utilizing this sample concentration technique will avoid these contamination problems by using Teflon or other inert materials for filtration.

7.0 CONCLUSIONS

The FTIR spectrometric analytical procedures described in this report have been subject to a test for validity according to a revised form of EPA Method 301, in which the option for (dynamic) analyte spiking was chosen. On the basis of these tests and the prescribed statistical calculations, the methodology is to be considered "valid" for a number of compounds in three different sampling systems. The number of compounds considered "valid" for each sampling system, and the approximate in-stack concentration corresponding to the spike concentration level, are summarized below.

Compounds Meeting Method 301 Analyte Spiking Criteria::

- 25 compounds for hot/wet sampling, at 10 ppm.
- 24 compounds for condenser sampling, at 10 ppm.
- 11 compounds for concentrated samples, at 500 ppb.

With the exception of m-xylene, all compounds which met the validation criteria in concentrated samples also passed for either the hot/wet or condenser samples. 16 compounds met the criteria for both the hot/wet and condenser sampling systems. 33 different compounds met the criteria for at least one sampling system, as well as a total of 60 compound/sampling system combinations.

The test procedures differed from those prescribed in Method 301 in the following ways:

- Gas phase samples were collected sequentially, rather than simultaneously.
- The required number of samples (24) was not obtained for all gas phase spike compounds, and fewer than the required number were obtained for all sample concentration spike compounds.
- Gas phase samples were spiked dynamically at 20% of the sample volume.
- The equivalent spike levels (10 ppm for gas samples, 500 ppb for concentrated samples) did not approximate the emission level in the effluent.

Further testing may be warranted for extension of concentration to high-boilers (via addition of cryo-trapping), extension of gas phase sampling to particular reactive species (e.g HCl, HF), and to compounds for which cylinder gas standards cannot be prepared.

8.0 REFERENCES

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TABLE 6-1.
Summary of Compounds Meeting Method 301 Criteria
in Hot/Wet and Condenser Samples.

#	Compound	Sampling System	# of Samples	Precision				Mean	
				Spiked	Unspiked	Bias	t-value	CF	Spiked
003	Acetonitrile	Hot/wet	24	8.99	23.10	0.91	0.55	0.92	15.42
006	Acrolein	Hot/wet	24	0.84	-10.69	0.75	4.86	0.94	11.18
009	Acrylonitrile	Hot/wet	24	0.97	3.82	0.45	3.28	0.96	12.19
010	Allyl Chloride	Hot/wet	24	3.62	-6.13	1.45	3.60	0.88	5.23
010	Allyl Chloride	Condenser	20	0.84	-6.76	1.33	5.62	1.15	5.43
015	Benzene	Hot/wet	24	1.38	-21.20	1.27	7.72	0.89	10.96
015	Benzene	Condenser	14	43.57	-15.03	3.82	1.72	1.62	5.08
022	Bromotorm	Hot/wet	20	0.98	-10.91	0.55	5.00	0.95	9.96
023	1,3-Butadiene	Hot/wet	24	1.44	-9.09	0.52	2.23	1.06	6.90
030	Carbonyl Sulfide	Hot/wet	24	0.41	16.02	-0.29	5.96	1.03	0.54
037	Chlorobenzene	Hot/wet	24	0.72	-14.61	2.69	5.13	0.79	3.73
037	Chlorobenzene	Condenser	14	1.27	24.14	1.59	6.52	0.36	2.36
077	Ethylbenzene	Condenser	20	1.35	42.84	2.97	4.27	0.77	3.22
079	Ethyl Chloride	Hot/wet	24	1.33	-3.09	1.48	2.70	0.88	7.14
079	Ethyl Chloride	Condenser	24	3.41	-29.28	1.67	1.50	0.87	0.11
080	Ethylene Dibromide	Hot/wet	24	0.75	-7.01	1.03	0.57	0.90	3.16
080	Ethylene Dibromide	Condenser	24	1.13	-14.01	0.45	3.32	0.95	3.92
095	n-Hexane	Hot/wet	24	1.46	-10.94	1.20	7.15	0.89	10.52
095	n-Hexane	Condenser	24	1.61	9.86	0.36	2.09	0.97	10.53
106	Methyl Bromide	Condenser	24	4.30	22.03	3.67	3.11	0.73	17.72
107	Methyl Chloride	Hot/wet	24	3.71	-6.79	-0.33	1.06	0.03	7.61
107	Methyl Chloride	Condenser	24	5.17	-41.57	-0.65	0.80	1.07	7.66
109	Methyl Ethyl Ketone	Hot/wet	24	5.52	-7.42	3.36	5.99	0.73	6.50
109	Methyl Ethyl Ketone	Condenser	24	11.70	-33.66	2.24	1.39	0.80	7.09
112	Methyl Isobutyl Ketone	Condenser	14	5.40	13.32	3.94	4.26	0.72	16.17
114	Methyl Methacrylate	Hot/wet	24	0.99	-3.34	0.79	6.74	0.93	8.46
114	Methyl Methacrylate	Condenser	24	1.51	28.69	-0.49	2.65	1.05	9.98
117	Methylene Chloride	Condenser	24	3.07	47.53	-1.34	1.94	1.15	9.98
124	2-Nitropropane	Hot/wet	24	0.56	33.69	0.57	2.84	0.94	10.12
124	2-Nitropropane	Condenser	24	4.59	21.96	0.17	0.33	0.98	10.08
142	Propylene Dichloride	Hot/wet	24	0.83	14.90	-0.27	1.48	1.03	11.26
142	Propylene Dichloride	Condenser	24	2.14	7.85	-0.37	0.68	1.04	15.60
147	Styrene	Condenser	24	1.11	10.31	3.11	18.82	0.78	14.33
151	Tetrachloroethylene	Condenser	14	0.60	-12.26	0.32	5.13	0.97	10.26
153	Toluene	Condenser	24	2.03	33.60	3.43	2.09	0.74	17.94
159	1,1,2-Trichloroethane	Hot/wet	24	5.26	-4.66	2.19	4.19	0.82	1.03
159	1,1,2-Trichloroethane	Condenser	24	1.21	-6.32	0.95	4.49	0.91	7.98
160	Trichloroethylene	Hot/wet	24	0.85	-12.16	1.03	10.07	0.90	10.05
160	Trichloroethylene	Condenser	24	1.07	36.90	1.03	8.71	0.90	10.59
165	2,2,4-Trimethylpentane	Hot/wet	20	0.62	-23.74	0.90	11.92	0.92	10.73
165	2,2,4-Trimethylpentane	Condenser	24	0.37	16.37	0.23	4.75	0.98	10.38
166	Vinyl Acetate	Hot/wet	24	49.09	-13.56	0.04	0.03	1.00	2.53
167	Vinyl Bromide	Hot/wet	24	0.79	15.00	-0.38	3.90	1.04	9.99
168	Vinyl Chloride	Hot/wet	24	0.66	-4.74	3.00	26.11	0.77	11.14
169	Vinyldiene Chloride	Hot/wet	24	0.37	12.29	-0.07	1.21	1.01	10.29
169	Vinyldiene Chloride	Condenser	24	0.20	34.04	-0.06	0.82	1.01	10.16
171	o-Xylene	Condenser	20	1.32	-23.90	4.24	17.75	0.70	13.58
173	p-Xylene	Hot/wet	24	1.31	7.60	3.70	15.14	0.73	15.51
173	p-Xylene	Condenser	24	4.25	25.36	3.15	2.22	0.76	17.93

* See Section 6.1. These compounds meet validation criteria but are not counted as validated compounds.

TABLE 6-2.
Summary of Compounds Meeting Method 301 Criteria
in Concentrated Samples.

ID #	Compound	# of Samples	Precision				Mean		
			Spiked	Unspiked	Bias	t-value	CF	Spiked	Unspiked
015	Benzene	8	8.99	18.86	-1.14	0.63	1.06	19.90	1.04
037	Chlorobenzene	12	6.24	33.89	4.95	2.33	0.80	28.39	3.44
080	Ethylene Dibromide	8	7.76	32.11	2.30	1.14	0.90	24.51	2.20
095	n-Hexane	8	28.26	13.92	-3.59	0.72	1.22	17.68	1.27
109	Methyl Ethyl Ketone	12	17.32	-31.16	4.26	1.09	0.82	22.27	-1.98
124	2-Nitropropane	8	2.42	37.08	3.11	4.16	0.87	21.67	-1.44
151	Tetrachloroethylene	8	26.67	44.51	-1.05	0.19	1.06	20.50	1.55
153	Toluene	12	10.31	-45.59	4.20	1.71	0.83	23.71	-0.49
160	Trichloroethylene	8	3.26	37.35	0.37	0.17	0.98	25.63	5.27
172	m-Xylene	12	4.85	43.31	5.65	4.44	0.78	26.00	0.36
173	p-Xylene	8	14.25	-36.71	-2.72	1.12	1.16	17.01	-0.28

TABLE 6-3. Compounds Meeting Method 301 Criteria in Hot/Wet Samples.

TABLE 6-3 (continued)

Acetonitrile-003			
SPIKED	DEV.	UNSPIKED	DEV.
12.59	1.96	3.35	0.85
14.56		4.19	
16.77	-1.91	3.70	-0.58
14.86		3.12	
16.45	0.13	3.39	2.42
16.58		5.81	
15.00	0.85	4.55	-0.53
15.84		4.02	
14.97	2.79	3.48	-0.16
17.76		3.31	
16.13	-2.65	3.69	1.75
13.49		5.43	
15.42	1.17	4.00	3.74
RSD=	8.99	- RSD=	23.10
Bias=	0.91	Exp Conc=	10.50
t=	0.55	CF=	0.92

Acrolein-006			
SPIKED	DEV.	UNSPIKED	DEV.
11.06	-0.02	-1.15	-0.20
11.04		-1.35	
11.24	0.12	-1.36	0.12
11.36		-1.24	
11.08	0.25	-1.24	0.23
11.33		-1.02	
11.21	0.05	-1.14	0.03
11.26		-1.11	
11.17	-0.16	-1.12	0.01
11.01		-1.11	
11.23	-0.02	-0.86	-0.27
11.21		-1.13	
11.18	0.23	-1.15	-0.09
RSD=	0.84	RSD=	-10.69
Bias=	0.75	Exp Conc=	11.58
t=	4.86	CF=	0.94

TABLE 6-3 (continued)

Acrylonitrile-009			
SPIKED	DEV.	UNSPIKED	DEV.
12.08	0.17	1.64	0.07
12.25		1.71	
12.15	0.12	1.79	-0.09
12.27		1.70	
11.98	0.12	1.79	0.06
12.10		1.85	
12.15	0.23	1.74	0.14
12.38		1.88	
12.04	0.24	1.79	-0.04
12.28		1.75	
12.30	0.06	1.60	0.12
12.36		1.72	
12.19	0.93	1.75	0.27
RSD=	0.97	- RSD=	3.82
Bias=	0.45	Exp Conc=	10.00
t=	3.28	CF=	0.96

Allyl Chloride-010			
SPIKED	DEV.	UNSPIKED	DEV.
6.23	0.13	-4.50	-1.02
6.36		-5.52	
6.12	0.28	-5.22	-0.17
6.40		-5.39	
6.00	0.40	-5.18	0.06
6.40		-5.12	
6.41	-0.15	-5.44	0.11
6.26		-5.33	
5.87	0.40	-5.52	-0.49
6.27		-6.00	
6.01	0.42	-5.95	0.09
6.43		-5.85	
6.23	1.48	-5.42	-1.42
RSD=	3.62	RSD=	-6.13
Bias=	1.45	Exp Conc=	10.20
t=	3.60	CF=	0.88

TABLE 6-3 (continued)

Benzene-015			
SPIKED	DEV.	UNSPIKED	DEV.
10.64	0.25	-0.57	0.12
10.89		-0.45	
10.93	0.17	-0.51	0.06
11.10		-0.45	
10.69	0.33	-0.16	-0.07
11.02		-0.23	
11.12	0.05	-0.14	-0.14
11.17		-0.28	
10.84	0.22	-0.15	-0.08
11.06		-0.23	
11.12	-0.14	-0.21	-0.03
10.98		-0.24	
10.96	0.88	-0.30	-0.14
RSD =	1.38	- RSD =	-21.20
Bias =	1.27	Exp Conc =	10.00
t =	7.72	CF =	0.89

Bromoform-022			
SPIKED	DEV.	UNSPIKED	DEV.
9.69	0.09	-0.51	0.03
9.79		-0.48	
9.85	0.06	-0.53	-0.08
9.91		-0.60	
9.85	0.24	-0.42	0.00
10.09		-0.42	
10.08	-0.01	-0.41	0.02
10.07		-0.39	
10.20	-0.16	-0.31	-0.13
10.04		-0.44	
9.96	0.22	-0.45	-0.16
RSD =	0.98	RSD =	-10.91
Bias =	0.55	Exp Conc =	9.86
t =	5.00	CF =	0.95

TABLE 6-3 (continued)

1,3-Butadiene-023			
SPIKED	DEV.	UNSPIKED	DEV.
7.02	0.11	-2.25	-0.11
7.12		-2.36	
7.10	-0.13	-2.54	0.15
6.97		-2.39	
6.93	-0.08	-2.45	0.69
6.85		-1.76	
6.92	0.11	-2.03	-0.08
7.03		-2.11	
6.46	0.27	-2.30	-0.06
6.73		-2.36	
6.80	0.02	-2.54	-0.04
6.82		-2.58	
6.90	0.30	-2.31	0.55
RSD=	1.44	- RSD=	-9.09
Blas=	-0.52	Exp Conc=	9.72
t=	2.23	CF=	1.06

Carbonyl Sulfide-030			
SPIKED	DEV.	UNSPIKED	DEV.
10.53	0.01	0.13	-0.04
10.53		0.09	
10.58	0.11	0.08	0.05
10.69		0.12	
10.56	0.09	0.15	0.00
10.65		0.15	
10.61	-0.02	0.14	-0.02
10.59		0.11	
10.43	0.01	0.21	-0.03
10.44		0.18	
10.47	-0.04	0.09	0.00
10.43		0.09	
10.54	0.16	0.13	-0.05
RSD=	0.41	RSD=	16.02
Blas=	-0.29	Exp Conc=	10.70
t=	5.96	CF=	1.03

TABLE 8-3 (continued)

Chlorobenzene-037			
SPIKED	DEV.	UNSPIKED	DEV.
9.52	-0.11	-3.16	-0.07
9.41		-3.23	
9.83	0.16	-3.44	0.32
10.00		-3.12	
9.58	-0.02	-3.00	0.22
9.56		-2.79	
9.61	-0.06	-3.09	0.06
9.55		-3.03	
9.99	-0.13	-3.23	0.12
9.87		-3.11	
9.92	-0.03	-1.44	-1.44
9.89		-2.88	
9.73	-0.18	-2.96	-0.80
RSD =	0.72	- RSD =	-14.61
Bias =	2.69	Exp Conc =	10.00
t =	6.13	CF =	0.79

Ethyl Chloride-079			
SPIKED	DEV.	UNSPIKED	DEV.
7.16	0.52	-4.19	0.20
7.68		-3.99	
7.13	0.62	-4.31	-0.03
7.75		-4.34	
7.40	1.12	-5.41	0.15
8.52		-5.26	
7.11	1.03	-5.15	-0.27
8.13		-5.42	
6.11	0.54	-6.14	0.06
6.64		-6.09	
6.12	-0.19	-6.07	-0.42
5.94		-6.48	
7.14	3.64	-5.24	-0.31
RSD =	7.33	- RSD =	-3.09
Bias =	1.48	Exp Conc =	10.90
t =	2.70	CF =	0.88

TABLE 6-3 (continued)

Ethylene Dibromide-080			
SPIKED	DEV.	UNSPIKED	DEV.
8.98	0.13	-1.07	0.14
9.11		-0.93	
9.14	0.16	-0.97	0.01
9.29		-0.96	
9.11	-0.02	-0.83	-0.18
9.09		-1.01	
9.14	0.06	-0.98	-0.01
9.20		-0.98	
9.17	-0.01	-0.94	-0.08
9.16		-1.02	
9.31	-0.11	-1.09	-0.01
9.21		-1.10	
9.16	0.20	-0.99	-0.13
RSD=	0.75	- RSD=	-7.01
Bias=	1.03	Exp Conc=	9.12
t=	10.57	CF=	0.90

n-Hexane-095			
SPIKED	DEV.	UNSPIKED	DEV.
10.08	0.34	-0.71	-0.03
10.42		-0.75	
10.49	0.05	-0.81	0.01
10.54		-0.80	
10.52	0.08	-0.38	-0.19
10.61		-0.57	
10.55	0.31	-0.62	0.01
10.86		-0.61	
10.33	0.16	-0.42	-0.13
10.48		-0.55	
10.58	0.19	-0.60	-0.04
10.78		-0.64	
10.52	1.13	-0.62	-0.37
RSD=	1.46	- RSD=	-10.94
Bias=	1.20	Exp Conc=	9.94
t=	7.15	CF=	0.89

TABLE 8-3 (continued)

Methyl Chloride-107			
SPIKED	DEV.	UNSPIKED	DEV.
7.81	-0.26	-1.05	-0.04
7.55		-1.10	
7.75	-0.06	-2.04	0.26
7.68		-1.78	
7.30	-0.01	-2.50	0.23
7.29		-2.27	
7.19	0.92	-2.03	-0.29
8.12		-2.32	
7.56	0.17	-2.51	0.12
7.72		-2.39	
7.65	0.05	-2.40	0.11
7.70		-2.29	
7.61	0.81	-2.06	0.38
RSD =	3.71	- RSD =	-6.79
Blas =	-0.33	Exp Conc =	10.00
t =	1.06	CF =	1.03

Methyl Ethyl Ketone-109			
SPIKED	DEV.	UNSPIKED	DEV.
6.59	-0.76	-3.88	-1.39
5.83		-5.26	
7.01	-0.64	-5.93	0.45
6.37		-5.48	
6.26	-0.02	-6.67	0.24
6.25		-6.43	
6.43	-0.09	-6.16	-0.26
6.34		-6.42	
6.96	-0.72	-6.11	0.00
6.24		-6.11	
6.75	0.18	-5.75	0.01
6.93		-5.74	
6.50	-2.05	-5.83	-0.95
RSD =	5.52	- RSD =	-7.42
Blas =	3.36	Exp Conc =	8.96
t =	5.99	CF =	0.73

TABLE 6-3 (continued)

Methyl Methacrylate-114			
SPIKED	DEV.	UNSPIKED	DEV.
8.38		-2.42	
8.39	0.01	-2.53	-0.11
8.61		-2.62	
8.63	0.02	-2.55	0.07
8.17		-2.34	
8.32	0.16	-2.48	-0.14
8.42		-2.55	
8.63	0.21	-2.50	0.04
8.48		-2.15	
8.36	-0.12	-2.34	-0.19
8.58		-2.31	
8.53	-0.05	-2.38	-0.07
8.46	0.22	-2.43	-0.39
RSD=	0.99	- RSD=	-3.34
Bias=	0.79	Exp Conc=	10.10
t=	6.74	CF=	0.93

2-Nitropropane-124			
SPIKED	DEV.	UNSPIKED	DEV.
9.92		0.84	
10.06	0.14	0.28	-0.56
10.19		0.30	
10.13	-0.07	0.52	0.22
10.22		0.52	
10.27	0.05	0.69	0.17
10.25		0.58	
10.24	-0.01	0.50	-0.08
10.08		0.83	
9.98	-0.10	0.61	-0.22
10.08		0.58	
10.04	-0.04	0.60	0.02
10.12	-0.03	0.57	-0.45
RSD=	0.56	RSD=	33.69
Bias=	0.57	Exp Conc=	8.98
t=	2.84	CF=	0.94

TABLE 6-3 (continued)

Propylene Dichloride-142			
SPIKED	DEV.	UNSPIKED	DEV.
11.83	0.07	1.27	-0.10
11.90		1.17	
11.64	0.06	1.12	-0.02
11.70		1.10	
11.10	0.18	1.23	-0.41
11.28		0.82	
11.20	-0.15	0.83	0.06
11.06		0.89	
10.58	0.20	1.10	-0.24
10.78		0.86	
10.99	0.03	1.20	-0.22
11.02		0.98	
11.26	0.39	1.05	-0.94
RSD=	0.83	- RSD=	14.90
Bias=	-0.27	Exp Conc=	10.48
t=	1.48	CF=	1.03

1,1,2-Trichloroethane-159			
SPIKED	DEV.	UNSPIKED	DEV.
0.89	0.00	-11.34	0.05
0.89		-11.29	
0.93	0.12	-11.87	0.42
1.05		-11.45	
0.78	0.06	-11.25	0.38
0.84		-10.87	
0.95	-0.02	-11.17	-0.02
0.93		-11.19	
1.19	0.08	-11.32	0.01
1.27		-11.31	
1.28	0.11	-9.59	-1.71
1.38		-11.30	
1.03	0.34	-11.16	-0.87
RSD=	5.26	RSD=	-4.66
Bias=	2.19	Exp Conc=	10.00
t=	4.19	CF=	0.82

TABLE 6-3 (continued)

Trichloroethylene-160			
SPIKED	DEV.	UNSPIKED	DEV.
9.95	0.08	-0.40	-0.01
10.03		-0.42	
10.02	0.01	-0.43	-0.01
10.03		-0.44	
10.07	0.16	-0.40	-0.16
10.22		-0.56	
10.17	0.03	-0.56	0.03
10.20		-0.53	
9.74	0.23	-0.38	-0.10
9.97		-0.49	
10.13	-0.05	-0.47	0.01
10.07		-0.45	
10.05	0.45	-0.46	-0.24
RSD=	0.85	- RSD =	-12.16
Bias=	1.03	Exp Conc=	9.48
t=	10.07	CF=	0.90

2,2,4-Trimethylpentane-165			
SPIKED	DEV.	UNSPIKED	DEV.
10.60	0.08	-0.16	0.00
10.68		-0.15	
10.70	0.00	-0.16	-0.01
10.70		-0.17	
10.65	0.18	-0.09	-0.08
10.83		-0.17	
10.81	-0.04	-0.16	-0.01
10.78		-0.17	
10.82	-0.08	-0.08	-0.07
10.74		-0.16	
10.73	0.15	-0.15	-0.17
RSD=	0.62	RSD=	-23.74
Bias=	0.90	Exp Conc=	9.98
t=	11.92	CF=	0.92

TABLE 6-3 (continued)

Vinyl Acetate-166			
SPIKED	DEV.	UNSPIKED	DEV.
2.41	0.55	-7.63	-0.96
2.96		-8.59	
2.85	1.09	-7.84	-0.18
3.94		-8.02	
3.14	-3.18	-8.11	1.27
-0.04		-6.84	
4.11	-1.66	-6.93	-1.61
2.45		-8.54	
2.43	-1.05	-7.52	1.34
1.38		-6.18	
3.26	-1.76	-6.01	-2.37
1.50		-8.38	
2.53	-6.02	-7.55	-2.50
RSD =	49.09	- RSD =	-13.56
Bias =	0.04	Exp Conc =	10.04
t =	0.03	CF =	1.00

Vinyl Bromide-167			
SPIKED	DEV.	UNSPIKED	DEV.
9.93	-0.07	0.30	0.04
9.85		0.34	
9.83	0.03	0.34	0.02
9.87		0.36	
9.91	0.10	0.40	-0.05
10.01		0.35	
10.06	-0.07	0.34	0.04
9.98		0.38	
10.07	0.02	0.33	0.12
10.09		0.45	
10.23	-0.23	0.32	0.12
10.00		0.44	
9.99	-0.22	0.36	0.28
RSD =	0.79	RSD =	15.00
Bias =	-0.38	Exp Conc =	10.00
t =	3.90	CF =	1.04

TABLE 6-3 (continued)

Vinyl Chloride-168			
SPIKED	DEV.	UNSPIKED	DEV.
11.22	-0.06	-1.89	0.02
11.16		-1.88	
11.34	-0.08	-1.88	-0.08
11.27		-1.96	
11.07	0.10	-1.94	-0.02
11.17		-1.96	
11.13	-0.03	-1.86	-0.10
11.10		-1.95	
11.21	-0.21	-2.15	0.09
11.00		-2.06	
11.03	-0.03	-1.27	-0.27
10.99		-1.54	
11.14	-0.32	-1.86	-0.35
RSD=	0.66	RSD=	-4.74
Bias=	3.00	Exp Conc=	10.00
t=	26.11	CF=	0.77

Vinylidene Chloride-169			
SPIKED	DEV.	UNSPIKED	DEV.
10.32	0.00	0.33	0.08
10.32		0.41	
10.30	0.02	0.34	-0.01
10.32		0.33	
10.49	-0.06	0.40	-0.04
10.43		0.36	
10.42	0.01	0.46	-0.11
10.43		0.35	
10.18	-0.11	0.40	-0.05
10.07		0.35	
10.11	-0.01	0.31	-0.04
10.10		0.27	
10.29	-0.17	0.36	-0.17
RSD=	0.37	RSD=	12.29
Bias=	-0.07	Exp Conc=	10.00
t=	1.21	CF=	1.01

TABLE 6-3 (continued)

p-Xylene-173			
SPIKED	DEV.	UNSPIKED	DEV.
15.22	0.25	1.83	0.24
15.48		2.07	
15.40	-0.34	1.81	-0.02
15.06		1.79	
15.61	0.44	1.81	-0.19
16.04		- 1.62	
15.28	0.29	1.69	0.20
15.57		1.89	
15.64	0.04	1.74	-0.10
15.68		1.63	
15.45	0.21	1.54	0.27
15.66		1.82	
15.51	0.90	1.77	0.40
RSD=	1.31	RSD=	7.60
Bias=	3.70	Exp Conc=	10.04
t=	15.14	CF=	0.73

TABLE 6-4. Compounds Meeting Method 301 Criteria in Condenser Samples.

TABLE 6-4 (continued)

Allyl Chloride-010			
SPIKED	DEV.	UNSPIKED	DEV.
3.79	0.05	-3.87	-0.49
3.84		-4.36	
3.97	-0.11	-4.29	0.41
3.85		-3.88	
7.01	-0.02	-2.65	-0.38
6.98		-3.03	
7.01	-0.03	-2.78	-0.30
6.98		-3.07	
		-3.23	-0.05
		-3.28	
		-3.47	0.09
		-3.38	
5.43	-0.12	-3.44	-0.71
RSD =	0.84	RSD =	-6.76
Bias =	-1.33	Exp Conc =	10.20
t =	5.62	CF =	1.15

Benzene-015			
SPIKED	DEV.	UNSPIKED	DEV.
9.61	-6.18	-2.11	-0.19
3.43		-2.30	
3.66	-0.78	-1.86	-0.19
2.88		-2.05	
5.73	-0.57	-0.56	0.45
5.16		-0.11	
		0.20	-0.26
		-0.06	
5.08	-7.52	-1.11	-0.18
RSD =	43.57	RSD =	-15.03
Bias =	-3.82	Exp Conc =	10.00
t =	1.72	CF =	1.62

TABLE 6-4 (continued)

Chlorobenzene-037			
SPIKED	DEV.	UNSPIKED	DEV.
11.93	0.43	1.04	
12.36		0.72	-0.33
12.38	-0.09	0.88	
12.29		1.43	0.55
12.39	-0.09	0.76	
12.31		0.74	-0.02
12.45	0.14	0.59	
12.59		0.65	0.07
12.50	-0.14	0.59	
12.36		0.58	-0.01
12.49	-0.24	0.64	
12.25		0.64	0.01
12.36	0.02	0.77	0.26
RSD=	1.27	RSD=	24.14
Bias=	1.59	Exp Conc=	10.00
t=	6.52	CF=	0.86

Ethyl Benzene-077			
SPIKED	DEV.	UNSPIKED	DEV.
11.70	-0.31	0.22	
11.40		0.38	0.16
11.44	0.29	0.31	
11.73		0.39	0.08
14.70	0.27	0.19	
14.98		0.12	-0.08
14.92	-0.04	0.22	
14.87		0.14	-0.09
		0.15	
		0.45	0.30
		0.20	
		0.24	0.04
13.22	0.21	0.25	0.41
RSD=	1.35	RSD=	42.84
Bias=	2.97	Exp Conc=	10.00
t=	14.27	CF=	0.77

TABLE 6-4 (continued)

Ethyl Chloride-079			
SPIKED	DEV.	UNSPIKED	DEV.
8.88		-1.07	
10.26	1.37	-2.35	-1.28
9.95		-2.22	
10.19	0.24	-2.35	-0.12
11.62		-5.86	
11.12	-0.49	-4.87	0.99
10.62		-2.27	
10.93	0.31	-2.50	-0.23
9.43		-0.86	
8.87	-0.57	-2.74	-1.88
8.52		-1.20	
10.98	2.46	-1.17	0.04
10.11	3.33	-2.46	-2.48
RSD =	8.41	RSD =	-29.28
Bias =	1.67	Exp Conc =	10.90
t =	1.50	CF =	0.87

Ethylene Dibromide-080			
SPIKED	DEV.	UNSPIKED	DEV.
8.83		-0.79	
8.97	0.14	-0.75	0.05
9.14		-0.72	
9.17	0.03	-0.74	-0.01
8.54		-0.59	
8.65	0.12	-0.67	-0.08
8.62		-0.65	
8.86	0.24	-0.75	-0.11
9.07		-0.37	
9.09	0.02	-0.65	-0.28
8.94		-0.56	
9.12	0.18	-0.64	-0.08
8.92	0.72	-0.66	-0.51
RSD =	1.13	RSD =	-14.01
Bias =	0.45	Exp Conc =	9.12
t =	3.32	CF =	0.95

TABLE 6-4 (continued)

n-Hexane-095			
SPIKED	DEV.	UNSPIKED	DEV.
10.11	0.01	0.25	0.01
10.12		0.26	
10.09	-0.01	0.23	-0.02
10.08		0.21	
10.76	0.57	0.20	0.01
11.32		0.21	
10.85	-0.12	0.20	0.06
10.73		0.26	
10.47	0.09	0.28	-0.04
10.56		0.24	
10.62	-0.01	0.19	0.03
10.61		0.21	
10.53	0.53	0.23	0.05
RSD=	1.61	RSD=	9.86
Bias=	0.36	Exp Conc=	9.94
t=	2.09	CF=	0.97

Methyl Bromide-106			
SPIKED	DEV.	UNSPIKED	DEV.
16.83	0.97	3.06	0.62
17.80		3.68	
17.03	1.62	4.71	1.90
18.65		6.61	
18.36	-0.91	4.40	0.67
17.45		5.07	
16.51	1.45	3.24	1.69
17.96		4.93	
18.27	-0.09	3.48	-0.30
18.19		3.18	
17.48	0.69	2.53	1.52
18.17		4.04	
17.72	3.74	4.08	6.10
RSD=	4.30	RSD=	22.03
Bias=	3.67	Exp Conc=	9.98
t=	3.11	CF=	0.73

TABLE 6-4 (continued)

Methyl Chloride-107			
SPIKED	DEV.	UNSPIKED	DEV.
8.48	0.95	-0.50	1.40
9.43		0.90	
9.87	-0.28	-0.82	1.04
9.59		0.22	
7.65	-0.58	-2.78	1.19
7.08		-1.59	
7.52	0.57	-2.54	0.25
8.09		-2.29	
5.72	0.00	-2.07	-1.06
5.72		-3.13	
6.62	-0.49	-2.59	-0.54
6.13		-3.13	
7.66	0.18	-1.69	2.28
RSD=	5.17	RSD=	-41.57
Bias=	-0.65	Exp Conc=	10.00
t=	0.80	CF=	1.07

Methyl Ethyl Ketone-109			
SPIKED	DEV.	UNSPIKED	DEV.
12.33	1.29	0.28	-0.65
13.62		-0.37	
13.76	0.52	-0.91	4.42
14.28		3.52	
3.20	1.97	-6.05	-0.07
5.17		-6.11	
2.88	0.93	-6.51	0.19
3.81		-6.32	
2.48	1.01	-5.62	-1.25
3.49		-6.86	
5.42	-0.75	-6.60	-1.17
4.67		-7.76	
7.09	4.97	-4.11	1.49
RSD=	11.70	RSD=	-33.66
Bias=	2.24	Exp Conc=	8.96
t=	1.39	CF=	0.80

TABLE 6-4 (continued)

Methyl Isobutyl Ketone-112			
SPIKED	DEV.	UNSPIKED	DEV.
15.91	0.62	2.93	-0.90
16.54		2.03	
16.54	0.44	2.38	-0.10
16.98		2.29	
14.35	2.35	2.10	0.26
16.70		2.36	
		1.56	0.67
		2.23	
16.17	3.42	2.23	-0.07
RSD=	5.40	RSD=	13.32
Bias=	3.94	Exp Conc=	10.00
t=	4.26	CF=	0.72

Methyl Methacrylate-114			
SPIKED	DEV.	UNSPIKED	DEV.
9.83	0.27	0.49	-0.10
10.10		0.38	
10.24	-0.08	0.38	0.03
10.17		0.41	
9.71	0.33	0.35	-0.17
10.04		0.17	
9.92	0.10	0.34	-0.04
10.03		0.30	
9.80	0.27	0.65	-0.30
10.08		0.35	
9.93	0.04	0.30	0.06
9.97		0.36	
9.98	0.93	0.37	-0.54
RSD=	1.51	RSD=	28.69
Bias=	-0.49	Exp Conc=	10.10
t=	2.65	CF=	1.05

TABLE 6-4 (continued)

Methylene Chloride-117			
SPIKED	DEV.	UNSPIKED	DEV.
8.74	0.12	-0.16	0.08
8.86		-0.08	
8.81	0.17	-0.10	-0.05
8.98		-0.15	
10.63	0.57	2.38	-0.02
11.20		2.36	
11.21	-0.61	2.01	2.09
10.61		4.10	
10.49	-0.19	1.68	-0.28
10.30		1.40	
10.26	-0.59	1.26	-0.36
9.67		0.90	
9.98	-0.52	1.30	1.46
RSD =	3.07	RSD =	47.53
Bias =	-1.34	Exp Conc =	10.02
t =	1.94	CF =	1.15

2-Nitropropane-124			
SPIKED	DEV.	UNSPIKED	DEV.
9.52	0.85	0.86	-0.19
10.37		0.67	
10.48	-0.11	0.72	0.02
10.37		0.74	
9.20	0.96	1.09	-0.17
10.16		0.92	
10.37	-0.09	0.87	0.04
10.28		0.91	
9.22	0.95	1.69	-0.66
10.17		1.03	
10.34	0.13	0.88	-0.08
10.48		0.80	
10.08	2.68	0.93	-1.04
RSD =	4.59	RSD =	21.96
Bias =	0.17	Exp Conc =	8.98
t =	0.33	CF =	0.98

TABLE 6-4 (continued)

Propylene Dichloride-142			
SPIKED	DEV.	UNSPIKED	DEV.
14.75	0.86	5.97	-0.19
15.61		5.78	
15.36	0.19	5.63	0.18
15.55		5.81	
15.88	0.50	6.51	-1.39
16.38		5.12	
15.90	-0.23	5.41	0.39
15.68		5.80	
14.99	0.49	4.89	-0.25
15.48		4.64	
15.74	0.11	5.12	0.07
15.85		5.19	
15.60	1.93	5.49	-1.18
RSD=	2.14	RSD=	7.85
Blas=	-0.37	Exp Conc=	10.48
t=	0.68	CF=	1.04

Styrene-147			
SPIKED	DEV.	UNSPIKED	DEV.
13.63	0.41	0.51	-0.02
14.04		0.49	
14.21	0.03	0.67	0.10
14.23		0.77	
14.30	0.22	0.24	0.07
14.52		0.30	
14.55	-0.14	0.26	0.08
14.41		0.34	
14.38	0.06	0.48	0.01
14.44		0.49	
14.49	0.25	0.49	-0.08
14.74		0.41	
14.33	0.83	0.46	0.16
RSD=	1.11	RSD=	10.31
Blas=	3.11	Exp Conc=	10.76
t=	18.82	CF=	0.78

TABLE 6-4 (continued)

Tetrachloroethylene-151			
SPIKED	DEV.	UNSPIKED	DEV.
10.21	0.15	-0.04	-0.02
10.37		-0.06	
10.42	0.00	-0.06	0.01
10.43		-0.05	
10.02	0.09	-0.06	-0.01
10.10		-0.07	
		-0.07	0.00
		-0.07	
10.26	0.24	-0.06	-0.02
RSD=	0.60	RSD=	-12.26
Bias=	0.32	Exp Conc=	10.00
t=	5.13	CF=	0.97

Toluene-153			
SPIKED	DEV.	-UNSPIKED	DEV.
18.59	0.62	4.08	-0.15
19.20		3.92	
19.22	0.40	5.09	5.49
19.62		10.58	
17.10	0.61	3.78	0.43
17.71		4.21	
16.86	0.64	4.04	0.04
17.50		4.08	
17.14	0.30	4.17	0.27
17.44		4.45	
17.23	0.44	4.53	-0.43
17.67		4.10	
17.94	3.00	4.75	5.65
RSD=	2.03	RSD=	33.60
Bias=	3.43	Exp Conc=	9.76
t=	2.09	CF=	0.74

TABLE 6-4 (continued)

1,1,2-Trichloroethane-159			
SPIKED	DEV.	UNSPIKED	DEV.
7.52	0.15	-3.35	0.12
7.67		-3.23	
7.51	0.19	-3.40	-0.40
7.70		-3.80	
8.07	0.17	-2.42	-0.41
8.24		-2.82	
8.24	-0.08	-2.87	-0.15
8.16		-3.02	
8.16	-0.13	-2.60	-0.22
8.03		-2.81	
8.10	0.01	-2.73	-0.15
8.11		-2.88	
7.96	0.32	-2.99	-1.20
RSD=	1.21	RSD=	-6.32
Bias=	0.95	Exp Conc=	10.00
t=	4.49	CF=	0.91

Trichloroethylene-160			
SPIKED	DEV.	UNSPIKED	DEV.
9.98	0.33	0.14	0.00
10.31		0.15	
10.33	0.06	0.13	0.00
10.39		0.13	
10.63	0.16	0.05	-0.05
10.78		0.00	
10.80	-0.02	0.04	-0.01
10.78		0.03	
10.67	0.12	0.16	-0.10
10.78		0.07	
10.81	0.04	0.06	0.01
10.85		0.07	
10.59	0.69	0.09	-0.14
RSD=	1.07	RSD=	36.90
Bias=	1.03	Exp Conc=	9.48
t=	8.71	CF=	0.90

TABLE 6-4 (continued)

2,2,4-Trimethylpentane-165			
SPIKED	DEV.	UNSPIKED	DEV.
10.08	0.09	0.16	
10.17		0.16	-0.01
10.11	0.05	0.17	
10.16		0.17	0.01
10.44	0.08	0.18	
10.52		0.16	-0.02
10.47	-0.02	0.18	
10.46		0.18	0.00
10.49	0.01	0.27	
10.50		0.17	-0.09
10.63	-0.04	0.18	
10.59		0.15	-0.03
10.38	0.16	0.18	-0.14
RSD=	0.37	RSD=	16.37
Blas=	0.23	Exp Conc=	9.98
t=	4.75	CF=	0.98

Vinylidene Chloride-169			
SPIKED	DEV.	UNSPIKED	DEV.
11.00	-0.01	0.20	
10.99		0.20	0.01
10.92	0.06	0.14	
10.98		0.39	0.25
9.70	0.03	0.21	
9.73		0.22	0.01
9.77	0.00	0.22	
9.77		0.18	-0.05
9.65	-0.01	0.25	
9.65		0.19	-0.06
9.87	-0.01	0.20	
9.86		0.23	0.03
10.16	0.07	0.22	0.18
RSD=	0.20	RSD=	34.04
Blas=	-0.06	Exp Conc=	10.00
t=	0.82	CF=	1.01

TABLE 6-4 (continued)

o-Xylene-171			
SPIKED	DEV.	UNSPIKED	DEV.
11.76		-0.63	
11.59	-0.17	-0.85	-0.21
11.94		-0.73	
11.58	-0.36	-0.88	-0.15
15.17		-0.62	
15.47	0.30	-0.52	0.10
15.61		-0.62	
15.53	-0.08	-0.78	-0.16
		-0.35	
		-0.73	-0.38
		-0.51	
		-0.74	-0.23
13.58	-0.31	-0.66	-1.03
RSD=	1.32	RSD=	-23.90
Bias=	4.24	Exp Conc=	10.00
t=	17.75	CF=	0.70

p-Xylene-173			
SPIKED	DEV.	UNSPIKED	DEV.
18.36		4.39	
18.81	0.45	3.90	-0.50
18.33		5.45	
18.00	-0.33	5.03	-0.42
17.75		4.44	
18.11	0.37	5.21	0.77
17.75		4.78	
15.50	-2.25	4.41	-0.37
18.49		5.92	
17.89	-0.60	3.82	-2.10
17.54		3.01	
18.58	1.05	6.43	3.42
17.93	-1.31	4.73	0.81
RSD=	4.25	RSD=	25.36
Bias=	3.15	Exp Conc=	10.04
t=	2.22	CF=	0.76

TABLE 6-5. Compounds Meeting Method 301 Criteria in Concentrated Samples.

TABLE 6-5 (continued)

Benzene-015			
SPIKED	DEV.	UNSPIKED	DEV.
19.95	2.08	1.94	-0.33
22.03		1.61	
16.88	3.86	0.13	0.35
20.74		0.48	
19.90	5.93	1.04	0.01
RSD=	8.99	RSD=	18.86
Bias=	-1.14	Exp Conc=	20.00
t=	0.63	CF=	1.06

Chlorobenzene-037			
SPIKED	DEV.	UNSPIKED	DEV.
25.84	3.36	4.38	-1.62
29.20		2.75	
25.61	0.78	1.55	1.30
26.40		2.85	
32.95	-2.63	3.58	1.96
30.32		5.54	
28.39	1.51	3.44	1.64
RSD=	6.24	RSD=	33.89
Bias=	4.95	Exp Conc=	20.00
t=	2.33	CF=	0.80

Ethylene Dibromide-080			
SPIKED	DEV.	UNSPIKED	DEV.
21.25	4.62	1.80	-0.13
25.87		1.67	
25.75	-0.58	1.81	1.73
25.17		3.54	
24.51	4.04	2.20	1.60
RSD=	7.76	RSD=	32.11
Bias=	2.30	Exp Conc=	20.00
t=	1.14	CF=	0.90

TABLE 8-5 (continued)

n-Hexane-095			
SPIKED	DEV.	UNSPIKED	DEV.
13.88	9.81	2.32	0.10
23.69		2.42	
17.51	-1.87	0.34	-0.34
15.64		0.00	
17.68	7.95	1.27	-0.24
RSD=	28.26	RSD=	13.92
Bias=	-3.59	Exp Conc=	20.00
t=	0.72	CF=	1.22

Methyl Ethyl Ketone-109			
SPIKED	DEV.	UNSPIKED	DEV.
20.30	-8.36	-2.99	-0.39
11.94		-3.39	
26.15	-1.18	-0.91	-0.60
24.97		-1.51	
27.27	-4.25	-2.22	1.33
23.02		-0.88	
22.27	-13.79	-1.98	0.34
RSD=	17.32	RSD=	-31.16
Bias=	4.26	Exp Conc=	20.00
t=	1.09	CF=	0.82

2-Nitropropane-124			
SPIKED	DEV.	UNSPIKED	DEV.
21.82	1.04	-1.76	-0.10
22.86		-1.86	
20.95	0.10	-1.61	1.06
21.05		-0.55	
21.67	1.14	-1.44	0.96
RSD=	2.42	RSD=	-37.08
Bias=	3.11	Exp Conc=	20.00
t=	4.16	CF=	0.87

TABLE 6-5 (continued)

Tetrachloroethylene-151			
SPIKED	DEV.	UNSPIKED	DEV.
20.45	4.73	1.90	0.26
25.18		2.16	
13.25	9.86	0.39	1.35
23.11		1.74	
20.50	14.59	1.55	1.61
RSD=	26.67	RSD=	44.51
Bias=	-1.05	Exp Conc=	20.00
t=	0.19	CF=	1.06

Toluene-153			
SPIKED	DEV.	UNSPIKED	DEV.
28.48	-5.87	-1.11	0.45
22.61		-0.66	
22.43	-0.10	-0.33	0.04
22.33		-0.29	
23.78	-1.15	-0.42	0.30
22.63		-0.12	
23.71	-7.13	-0.49	0.79
RSD=	10.31	RSD=	-45.59
Bias=	4.20	Exp Conc=	20.00
t=	1.71	CF=	0.83

Trichloroethylene-160			
SPIKED	DEV.	UNSPIKED	DEV.
27.88	-0.51	9.10	-3.83
27.37		5.27	
22.65	1.98	1.89	2.92
24.63		4.81	
25.63	1.47	5.27	-0.92
RSD=	3.26	RSD=	37.35
Bias=	0.37	Exp Conc=	20.00
t=	0.17	CF=	0.98

TABLE 6-5 (continued)

m-Xylene-172			
SPIKED	DEV.	UNSPIKED	DEV.
25.26	2.89	0.24	0.15
28.15		0.39	
24.99	-0.38	0.13	0.10
24.61		0.22	
27.02	-1.04	0.42	0.34
25.99		0.75	
26.00	1.47	0.36	0.58
RSD =	4.85	RSD =	43.31
Bias =	5.65	Exp Conc =	20.00
t =	4.44	CF =	0.78

p-Xylene-173			
SPIKED	DEV.	UNSPIKED	DEV.
11.80	4.67	-0.44	0.19
16.47		-0.25	
19.23	1.30	-0.24	0.08
20.54		-0.16	
17.01	5.97	-0.28	0.27
RSD =	14.25	RSD =	-36.71
Bias =	-2.72	Exp Conc =	20.00
t =	1.12	CF =	1.16

**TABLE 6-6. Analytical Details for Compounds
Presented in Tables 6-3 through 6-5.**

TABLE 6-6 (con't)

Hot/Wet Analysis File for
Acetonitrile

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Acetonitrile	003a4ara.ds ^f	4.97	4.94	0.59
Acetonitrile	003a4arb.ds ^f	4.97	4.99	0.29
Acetonitrile	003a4arc.ds ^f	1.006	1.05	4.57
Acetonitrile	003a4ard.ds ^f	1.015	1.04	2.54
Benzene	015a4ara.ds ^f	5.052	5.05	0.01
Benzene	015a4arb.ds ^f	5.052	5.07	0.26
Benzene	015a4arc.ds ^f	1.036	1.01	2.86
Benzene	015a4ard.ds ^f	1.016	0.99	3.10
Methanol	104a4asa.ds ^f	5.113	5.10	0.22
Methanol	104a4asb.ds ^f	5.113	5.13	0.37
Methanol	104a4asc.ds ^f	1.016	1.00	1.96
Methanol	104a4asd.ds ^f	1.016	1.00	1.55
Methanol	104a4ase.ds ^f	0.203	0.20	2.43
Methanol	104a4ASF.ds ^f	0.206	0.19	8.63
Methyl isobutyl ketone	112a4ara.ds ^f	5.031	5.13	1.88
Methyl isobutyl ketone	112a4arb.ds ^f	5.031	5.17	2.67
Methyl isobutyl ketone	112a4arc.ds ^f	1.014	0.52	48.69
Methyl isobutyl ketone	112a4ard.ds ^f	1.012	0.61	40.17
Methyl isobutyl ketone	112a4are.ds ^f	0.202	-0.32	258.25
Methyl isobutyl ketone	112a4arf.ds ^f	0.203	-0.42	304.30
Tetrachloroethylene	151a4asa.ds ^f	4.574	4.23	7.45
Tetrachloroethylene	151a4asb.ds ^f	4.574	4.28	6.45
Tetrachloroethylene	151a4asd.ds ^f	1.013	2.72	168.26
Tetrachloroethylene	151a4ase.ds ^f	0.203	3.00	1376.27
Tetrachloroethylene	151a4ASF.ds ^f	0.203	3.23	1486.51

Analytical Regions (wavenumbers)		Baseline	Analytical Regions	
Lower	Upper		1039.9	1064
882.43	884.5		07/09/93	

TABLE 6-6 (con't)

Hot/Wet Analysis File for
Acrolein

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1ASF	25.413	25.41	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Acrolein	006b4ana.dsF	3.011	3.07	1.77
Acrolein	006b4anb.dsF	3.017	2.93	2.73
Acrolein	006b4ane.dsF	0.604	0.68	12.76
Acrolein	006b4anf.dsF	0.603	0.67	10.62
Acrolein	006b4anh.dsF	0.121	0.14	13.19
Carbonyl sulfide	030a4asc.dsF	1.012	0.84	16.87
Carbonyl sulfide	030a4ase.dsF	0.203	1.05	418.26
Chlorobenzene	037a4arc.dsF	4.828	4.62	4.36
Chlorobenzene	037a4arh.dsF	1.02	2.14	109.85
Chlorobenzene	037a4arj.dsF	0.203	-0.43	309.38
1,1,2-Trichloroethane	159b4asa.dsF	3.033	3.04	0.25
1,1,2-Trichloroethane	159b4asc.dsF	0.602	0.57	4.85
1,1,2-Trichloroethane	159b4asf.dsF	0.121	0.08	36.47
Vinyl chloride	168a4asa.dsF	5.092	5.09	0.07
Vinyl chloride	168a4asd.dsF	1.023	1.04	1.48
Vinyl chloride	168a4ase.dsF	0.203	0.22	7.88
SF6	SF6_002	0.059	0.06	0.00
Nitric oxide	NO2zap	10.1	10.10	0.00
Hydrogen chloride	HCl_2e	100	100.00	0.00

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
2548.76	2549.79	3159.74	3161.27	2636.11	2875.59
836.84	838.41	1977.81	1978.99	913.7	1000.35

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TABLE 6-6 (con't)

**Hot/Wet Analysis File for
Acrylonitrile**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1ASF	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Acrylonitrile	009a4ara.dsF	4.991	4.97	0.51
Acrylonitrile	009a4arb.dsF	4.991	5.01	0.45
Acrylonitrile	009a4arc.dsF	1.006	1.02	1.28
Acrylonitrile	009a4ard.dsF	1.014	1.01	0.01
Acrylonitrile	009a4are.dsF	0.203	0.21	2.76
Acrylonitrile	009a4arf.dsF	0.2	0.20	0.74
Allyl Chloride	010b4asa.dsF	3.093	3.10	0.15
Allyl Chloride	010b4asb.dsF	3.093	3.10	0.21
Allyl Chloride	010b4asc.dsF	0.601	0.58	3.92
Allyl Chloride	010b4asd.dsF	0.602	0.57	5.38
Ethyl benzene	077a4ara.dsF	5.113	4.98	2.60
Ethyl benzene	077a4arb.dsF	5.113	5.27	3.05
Ethyl benzene	077a4arc.dsF	1.014	0.99	2.80
Ethyl benzene	077a4ard.dsF	1.017	0.96	5.88
Ethyl benzene	077a4arf.dsF	0.203	0.06	71.05
o-Xylenes	171a4asa.dsF	5.072	4.99	1.64
o-Xylenes	171a4asb.dsF	5.072	5.09	0.31
o-Xylenes	171a4asc.dsF	1.015	1.03	1.60
o-Xylenes	171a4asd.dsF	1.016	1.18	16.08
o-Xylenes	171a4ase.dsF	0.203	0.59	188.67
o-Xylenes	171a4ASF.dsF	0.203	0.60	196.32
SF6	SF6_002	0.057	0.06	0.00

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
872.85	874.63	2140.9	2142.48	922.19	997.82

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TABLE 6-6 (con't)

**Hot/Wet Analysis File for
Allyl Chloride**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Acrylonitrile	009a4ara.ds ^f	4.991	4.96	0.56
Acrylonitrile	009a4arb.ds ^f	4.991	5.01	0.42
Acrylonitrile	009a4arc.ds ^f	1.006	1.03	2.44
Acrylonitrile	009a4ard.ds ^f	1.014	1.02	0.55
Acrylonitrile	009a4are.ds ^f	0.203	0.22	8.00
Acrylonitrile	009a4arf.ds ^f	0.2	0.21	5.34
Allyl Chloride	010b4asa.ds ^f	3.093	3.11	0.37
Allyl Chloride	010b4asb.ds ^f	3.093	3.10	0.22
Allyl Chloride	010b4asc.ds ^f	0.601	0.56	6.47
Allyl Chloride	010b4asd.ds ^f	0.602	0.55	9.14
Ethyl benzene	077a4ara.ds ^f	5.113	5.17	1.11
Ethyl benzene	077a4arb.ds ^f	5.113	5.24	2.50
Ethyl benzene	077a4arc.ds ^f	1.014	0.46	54.35
Ethyl benzene	077a4ard.ds ^f	1.017	0.80	21.00
Ethyl benzene	077a4arf.ds ^f	0.203	-0.62	406.61
o-Xylenes	171a4asa.ds ^f	5.072	5.24	3.27
Xylenes	171a4asb.ds ^f	5.072	5.27	3.84
Xylenes	171a4asc.ds ^f	1.015	0.69	32.27
o-Xylenes	171a4asd.ds ^f	1.016	0.16	84.36
o-Xylenes	171a4ase.ds ^f	0.203	-1.30	739.82
o-Xylenes	171a4ASF.ds ^f	0.203	-1.36	769.59
SF6	SF6_002	0.057	0.06	0.00

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower		Upper			
873.86	875.12	2143.24	2143.78	893.51	1002.22
873.86	875.12	2143.24	2143.78	1241.86	1301.73

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TABLE 6-6 (con't)

**Hot/Wet Analysis File for
Benzene**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.03	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Acetonitrile	003a4ara.ds ^f	4.97	4.90	1.36
Acetonitrile	003a4arb.ds ^f	4.97	4.96	0.15
Acetonitrile	003a4arc.ds ^f	1.006	1.25	23.99
Acetonitrile	003a4ard.ds ^f	1.015	1.14	12.63
Benzene	015a4ara.ds ^f	5.052	5.05	0.09
Benzene	015a4arb.ds ^f	5.052	5.07	0.39
Benzene	015a4arc.ds ^f	1.036	1.01	2.81
Benzene	015a4ard.ds ^f	1.016	0.97	4.30
Methanol	104a4asa.ds ^f	5.113	5.10	0.20
Methanol	104a4asb.ds ^f	5.113	5.14	0.50
Methanol	104a4asc.ds ^f	1.016	0.98	3.43
Methanol	104a4asd.ds ^f	1.016	0.98	3.40
Methanol	104a4ase.ds ^f	0.203	0.20	4.01
Methanol	104a4asf.ds ^f	0.206	0.18	12.09
Methyl isobutyl ketone	112a4ara.ds ^f	5.031	4.95	1.54
Methyl isobutyl ketone	112a4arb.ds ^f	5.031	5.11	1.62
Methyl isobutyl ketone	112a4arc.ds ^f	1.014	1.16	14.77
Methyl isobutyl ketone	112a4ard.ds ^f	1.012	1.02	1.08
Methyl isobutyl ketone	112a4are.ds ^f	0.202	-0.16	180.05
Methyl isobutyl ketone	112a4arf.ds ^f	0.203	-0.33	261.06
Tetrachloroethylene	151a4asa.ds ^f	4.574	4.57	0.04
Tetrachloroethylene	151a4asb.ds ^f	4.574	3.97	13.23
Tetrachloroethylene	151a4asd.ds ^f	1.013	2.90	186.29
Tetrachloroethylene	151a4ase.ds ^f	0.203	2.54	1149.65
Tetrachloroethylene	151a4asf.ds ^f	0.203	2.12	944.97
Hydrogen chloride	HCl_2e	100	100.00	0.00

Analytical Regions (wavenumbers)				Analytical Regions	
Baseline					
Lower		Upper			
2759	2760.92	3156.59	3157.38	3020.15	3124.44
873.39	875.8	1978.93	1979.78	1010.22	1063.18

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TABLE 6-6 (con't)

Hot/Wet Analysis File for
Bromoform

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1ast	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Bromoform	022b4asc.ds ^f	0.605	0.61	0.21
Bromoform	022b4asd.ds ^f	0.604	0.61	0.83
Bromoform	022b4ase.ds ^f	0.121	0.10	17.31
Bromotorm	022b4ast.ds ^f	0.121	0.11	8.91
Carbon tetrachloride	029a4asc.ds ^f	1.015	0.82	19.71
Carbon tetrachloride	029a4asd.ds ^f	1.016	0.91	10.20
Carbon tetrachloride	029a4ase.ds ^f	0.203	1.02	401.51
Carbon tetrachloride	029a4ast.ds ^f	0.203	0.85	318.59
Carbon tetrachloride	029a4asg.ds ^f	0.051	0.21	318.46
Carbon tetrachloride	029a4ash.ds ^f	0.052	0.11	107.48
Carbon disulfide	028a4asa.ds ^f	5.092	5.85	14.84
Carbon disulfide	028a4asb.ds ^f	5.092	3.66	28.19
Carbon disulfide	028a4asc.ds ^f	1.018	2.67	161.99
Carbon disulfide	028a4asd.ds ^f	1.014	2.70	165.65
Carbon disulfide	028a4asg.ds ^f	0.204	0.58	184.86
2,2,4-Trimethylpentane	165a4asa.ds ^f	5.102	5.11	0.14
2,2,4-Trimethylpentane	165a4asb.ds ^f	5.102	5.24	2.68
2,2,4-Trimethylpentane	165a4asc.ds ^f	1.015	0.75	26.26
2,2,4-Trimethylpentane	165a4asd.ds ^f	1.015	0.72	28.81
2,2,4-Trimethylpentane	165a4ase.ds ^f	0.202	-0.17	183.28
2,2,4-Trimethylpentane	165a4ast.ds ^f	0.203	-0.24	218.53
2,2,4-Trimethylpentane	172a4are.ds ^f	0.203	-1.29	734.58
2,2,4-Trimethylpentane	172a4arf.ds ^f	0.201	0.16	22.49
n-Xylenes	172a4arg.ds ^f	4.93	4.25	13.70
m-Xylenes	172a4arh.ds ^f	4.93	5.14	4.21
m-Xylenes	172a4ari.ds ^f	1.015	3.60	254.17

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
1003.7	1005.28	1977.61	1979.78	1134.18	1159.35

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TABLE 6-6 (con't)

Hot/Wet Analysis File for
1,3-Butadiene

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	999.97	0.00
Sulfur dioxide	198c1asf	25.791	25.80	0.02
Carbon dioxide	CO2a	11	11.00	0.01
1,3-Butadiene	023a4asa.ds ^f	5.092	5.08	0.19
1,3-Butadiene	023a4asb.ds ^f	5.092	5.08	0.31
1,3-Butadiene	023a4asc.ds ^f	1.006	1.08	7.03
1,3-Butadiene	023a4asd.ds ^f	1.022	1.08	5.21
1,3-Butadiene	023a4ase.ds ^f	0.205	0.22	6.62
1,3-Butadiene	023a4ASF.ds ^f	0.203	0.21	5.27
Propylene dichloride	142b4asa.ds ^f	3.045	3.04	0.11
Propylene dichloride	142b4asb.ds ^f	3.045	3.05	0.21
Propylene dichloride	142b4asc.ds ^f	0.598	0.59	2.10
Propylene dichloride	142b4asd.ds ^f	0.601	0.60	0.80
Propylene dichloride	142b4ase.ds ^f	0.121	0.13	5.67
Propylene dichloride	142b4ASF.ds ^f	0.121	0.13	4.78
Styrene	147a4asb.ds ^f	5.082	5.08	0.13
Styrene	147a4asc.ds ^f	1.015	1.10	7.99
Styrene	147a4asd.ds ^f	1.014	0.98	3.29
Styrene	147a4ase.ds ^f	0.202	0.17	14.98
Styrene	147a4ASF.ds ^f	0.203	0.17	18.73
Trichloroethylene	160a4asa.ds ^f	5.102	5.08	0.53
Trichloroethylene	160a4asb.ds ^f	5.102	5.16	1.12
Trichloroethylene	160a4asc.ds ^f	1.014	0.90	11.03
Trichloroethylene	160a4asd.ds ^f	1.016	0.98	3.46
Trichloroethylene	160a4ase.ds ^f	0.203	0.20	2.67
Trichloroethylene	160a4ASF.ds ^f	0.203	0.20	4.33
SF6	SF6_002	0.057	0.06	0.00
Nitric oxide	NO2zap	10.1	10.10	0.00
Hydrogen chloride	HCl_2e	100	100.00	0.00

Analytical Regions (wavenumbers)				Analytical Regions	
Baseline					
Lower		Upper			
869.06	869.75	1234.92	1236	866.72	1052.64

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TABLE 6-6 (con't)

**Hot/Wet Analysis File for
Carbonyl sulfide**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.62	0.06
Sulfur dioxide	198c1ast	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Acrolein	006b4ana.ds ^f	3.011	2.76	8.52
Acrolein	006b4ane.ds ^f	0.604	1.48	145.90
Acrolein	006b4anh.ds ^f	0.121	0.14	17.00
Carbonyl sulfide	030a4asc.ds ^f	1.012	1.01	0.12
Carbonyl sulfide	030a4asd.ds ^f	1.017	1.01	0.90
Carbonyl sulfide	030a4ase.ds ^f	0.203	0.23	11.75
Carbonyl sulfide	030a4ast.ds ^f	0.203	0.22	7.67
Chlorobenzene	037a4arc.ds ^f	4.828	5.23	8.21
Chlorobenzene	037a4arf.ds ^f	1.303	1.03	21.34
Chlorobenzene	037a4arj.ds ^f	0.203	0.38	88.61
1,1,2-Trichloroethane	159b4asa.ds ^f	3.033	2.97	1.96
1,1,2-Trichloroethane	159b4asc.ds ^f	0.602	1.48	144.82
1,1,2-Trichloroethane	159b4ase.ds ^f	0.12	0.13	11.55
Vinyl chloride	168a4asa.ds ^f	5.092	5.10	0.11
Vinyl chloride	168a4asd.ds ^f	1.023	1.00	2.55
Vinyl chloride	168a4ase.ds ^f	0.203	0.19	4.57
Carbon monoxide	197asm	100	100.01	0.01
Acrolein	006b4anb.ds ^f	3.017	3.10	2.64
Chlorobenzene	037a4ard.ds ^f	4.828	4.50	6.81
1,1,2-Trichloroethane	159b4asb.ds ^f	3.033	2.92	3.74
Nitric oxide	NO2zap	10.1	10.10	0.00
Hydrogen chloride	HCl 2e	100	100.05	0.05

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower		Upper			
1977.56	1979.68	2132.95	2133.99	2029.21	2075.69
1977.56	1979.68	2132.95	2133.99	2078.84	2083.76
1977.56	1979.68	2132.95	2133.99	2883.97	2939.11
1977.56	0	1979.68	0	826.08	884.38
1977.56	0	1979.68	0	1023.81	1078.96
2548.66	2549.6	3160.09	3161.12	2876.97	2940

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TABLE 6-6 (con't)

**Hot/Wet Analysis File for
Chlorobenzene**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1ast	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Carbon monoxide	197asm	376.1	376.10	0.00
SF6	SF6_002	0.059	0.06	0.00
Acrolein	006b4anb.dsf	3.017	2.98	1.26
Acrolein	006b4ane.dsf	0.604	0.78	29.50
Acrolein	006b4anf.dsf	0.603	0.55	8.22
Acrolein	006b4anh.dsf	0.121	0.43	258.31
Carbonyl sulfide	030a4asc.dsf	1.012	0.96	5.26
Carbonyl sulfide	030a4asd.dsf	1.017	0.95	7.07
Carbonyl sulfide	030a4ase.dsf	0.203	0.51	149.17
Carbonyl sulfide	030a4ASF.dsf	0.203	0.53	158.40
Chlorobenzene	037a4arc.dsf	4.828	5.10	5.59
Chlorobenzene	037a4ard.dsf	4.828	4.58	5.12
Chlorobenzene	037a4arf.dsf	1.033	1.01	2.38
Chlorobenzene	037a4arh.dsf	1.02	0.94	8.29
Chlorobenzene	037a4arj.dsf	0.203	0.21	2.17
1,1,2-Trichloroethane	159b4asa.dsf	3.033	2.69	11.26
1,1,2-Trichloroethane	159b4asb.dsf	3.033	3.06	0.95
1,1,2-Trichloroethane	159b4asc.dsf	0.602	1.25	106.87
1,1,2-Trichloroethane	159b4asd.dsf	0.604	1.36	124.98
1,1,2-Trichloroethane	159b4ase.dsf	0.12	1.00	733.26
Nitric oxide	NO2zap	10.1	10.10	0.00
Vinyl chloride	168a4asa.dsf	5.092	7.38	44.97
Vinyl chloride	168a4asb.dsf	5.092	1.44	71.66
Vinyl chloride	168a4asc.dsf	1.013	7.40	630.64
Vinyl chloride	168a4asd.dsf	1.023	1.44	40.65
Vinyl chloride	168a4ase.dsf	0.203	0.29	41.88
Hydrogen chloride	HCl_2e	100	100.00	0.00

Analytical Regions (wavenumbers)				Analytical Regions	
Baseline					
Lower		Upper			
833.14	833.98	1977.71	1979.58	1012.42	1036.64
2629.56	2634.09	3144.53	3146.79	3029.76	3113.07

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TABLE 6-6 (con't)

**Hot/Wet Analysis File for
Ethyl chloride**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1ast	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Ethyl chloride	079b4asa.ds ^f	2.997	3.09	2.94
Ethyl chloride	079b4asb.ds ^f	2.997	3.03	1.01
Ethyl chloride	079b4asc.ds ^f	0.604	0.44	27.55
Ethyl chloride	079b4asd.ds ^f	0.602	0.18	70.42
Ethyl chloride	079b4ase.ds ^f	0.121	0.12	2.98
Ethyl chloride	079b4ast.ds ^f	0.121	0.12	1.09
Methyl bromide	106a4asb.ds ^f	4.919	4.94	0.36
Methyl bromide	106a4asc.ds ^f	4.919	4.95	0.68
Methyl bromide	106a4asd.ds ^f	1.017	0.89	12.80
Methyl bromide	106a4ase.ds ^f	1.018	0.90	11.27
Methyl iodide	111a4asa.ds ^f	4.95	4.96	0.26
Methyl iodide	111a4asb.ds ^f	4.95	4.95	0.04
Methyl iodide	111a4asc.ds ^f	1.02	1.00	2.21
Methyl iodide	111a4asd.ds ^f	1.016	0.97	5.04
Methyl methacrylate	114b4asa.ds ^f	3.051	3.10	1.47
Methyl methacrylate	114b4asb.ds ^f	3.051	3.06	0.37
Methyl methacrylate	114b4asc.ds ^f	0.604	0.48	20.03
Methyl methacrylate	114b4asd.ds ^f	0.603	0.48	20.90
Methyl methacrylate	114b4ase.ds ^f	0.123	-0.01	110.18
Methyl methacrylate	114b4ast.ds ^f	0.121	0.07	40.47
Nitric oxide	NO2zap	10.1	10.10	0.00
SF6	SF6_002	0.057	0.06	0.00
Hydrogen chloride	HCl_2e	100	100.00	0.00

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower		Upper			
2545.12	2586.87	4310.76	4311.84	2916.56	3041.03
1006.16	1006.66	2159.49	2159.79	1263.97	1312.02
874.31	875.59	1006.16	1006.66	943.43	1000.16

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TABLE 6-6 (con't)

**Hot/Wet Analysis File for
Ethylene dibromide**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Ethylene dibromide	080a4ara.ds ^f	5.031	4.86	3.38
Ethylene dibromide	080a4arb.ds ^f	5.031	5.18	2.92
Ethylene dibromide	080a4arc.ds ^f	1.016	1.14	12.07
Ethylene dibromide	080a4ard.ds ^f	1.017	1.01	0.75
Ethylene dibromide	080a4are.ds ^f	0.203	0.21	1.39
Ethylene dibromide	080a4arf.ds ^f	0.202	0.20	2.42
Methyl chloroform	108a4asa.ds ^f	5.123	5.09	0.65
Methyl chloroform	108a4asb.ds ^f	5.123	5.17	0.85
Methyl chloroform	108a4asc.ds ^f	1.01	1.08	6.46
Methyl chloroform	108a4asd.ds ^f	1.012	0.91	9.96
Methyl chloroform	108a4ase.ds ^f	0.203	0.17	16.84
Methyl chloroform	108a4ASF.ds ^f	0.203	0.16	22.56
2-Nitropropane	124b4ana.ds ^f	3.013	2.99	0.65
2-Nitropropane	124b4anb.ds ^f	3.016	2.61	13.50
2-Nitropropane	124b4anc.ds ^f	0.604	0.99	63.44
2-Nitropropane	124b4and.ds ^f	0.603	2.21	266.54
2-Nitropropane	124b4ane.ds ^f	0.121	0.51	326.48
2-Nitropropane	124b4anf.ds ^f	0.124	0.44	255.53

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
868.55	869.92	2536.6	2541.32	1178.74	1196.46
868.55	869.92	2536.6	2541.32	1241.71	1266.92

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TABLE 6-6 (con't)

**Hot/Wet Analysis File for
Hexane**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Nitric oxide	NO2zap	100	100.00	0.00
Hexane	095a4asa.ds ^f	5.092	5.08	0.18
Hexane	095a4asb.ds ^f	5.092	5.11	0.35
Hexane	095a4asc.ds ^f	1.021	0.96	6.47
Hexane	095a4asd.ds ^f	1.02	1.04	2.37
Hexane	095a4ase.ds ^f	0.206	0.20	4.15
Hexane	095a4asf.ds ^f	0.203	0.20	1.12
Methylene chloride	117a4asa.ds ^f	5.082	5.06	0.51
Methylene chloride	117a4asb.ds ^f	5.082	5.10	0.28
Methylene chloride	117a4asc.ds ^f	1.015	1.07	5.02
Methylene chloride	117a4asd.ds ^f	0.972	0.99	1.52
Methylene chloride	117a4ase.ds ^f	0.202	0.12	39.72
Methylene chloride	117a4asf.ds ^f	0.201	0.24	20.27
Propylene oxide	143b4ana.ds ^f	15.065	14.96	0.70
Propylene oxide	143b4anb.ds ^f	15.086	15.09	0.01
Propylene oxide	143b4and.ds ^f	3.018	3.55	17.55
Vinyl acetate	166a4asa.ds ^f	5.082	5.02	1.30
Vinyl acetate	166a4asb.ds ^f	5.082	5.05	0.74
Vinyl acetate	166a4asc.ds ^f	1.013	1.24	21.97
Vinyl acetate	166a4asd.ds ^f	1.017	1.20	18.27
Vinyl acetate	166a4ase.ds ^f	0.203	0.50	144.50
Vinyl acetate	166a4asf.ds ^f	0.203	0.46	127.14
p-Xylenes	173a4asa.ds ^f	5.102	4.99	2.26
p-Xylenes	173a4asb.ds ^f	5.102	5.25	2.91
p-Xylenes	173a4asc.ds ^f	1.007	0.90	10.41
p-Xylenes	173a4asd.ds ^f	1.018	0.96	6.09
Hydrogen chloride	HCl_2e	100	100.00	0.00

Analytical Regions (wavenumbers)

Baseline

Lower	Upper	Analytical Regions
2556.39	3159.84	2835.27 3005.45 07/09/93

TABLE 6-6 (con't)

**Hot/Wet Analysis File for
Methyl chloride**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Methyl chloride	107a4asa.ds ^f	5.092	5.08	0.28
Methyl chloride	107a4asb.ds ^f	5.092	5.09	0.04
Methyl chloride	107a4asc.ds ^f	1.014	1.06	3.97
Methyl chloride	107a4asd.ds ^f	1.018	1.03	1.06
Methyl chloride	107a4ase.ds ^f	0.204	0.23	13.16
Methyl chloride	107a4ASF.ds ^f	0.203	0.23	11.46
Vinyl bromide	167a4asa.ds ^f	5.082	5.07	0.32
Vinyl bromide	167a4asb.ds ^f	5.082	5.07	0.26
Vinyl bromide	167a4asc.ds ^f	1.014	1.09	6.94
Vinyl bromide	167a4asd.ds ^f	1.017	1.08	6.36
Vinyl bromide	167a4ase.ds ^f	0.203	0.25	22.56
Vinyl bromide	167a4ASF.ds ^f	0.203	0.22	6.91
Acetone	192a4arb.ds ^f	5.021	5.07	0.89
Acetone	192a4arc.ds ^f	1.014	0.92	9.19
Acetone	192a4ard.ds ^f	1.015	0.93	8.16
Acetone	192a4are.ds ^f	0.203	0.10	49.43
Acetone	192a4arf.ds ^f	0.203	0.08	59.44
Sulfur dioxide	198c1ASF	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
SF6	SF6_002	0.057	0.06	0.00
Nitric oxide	NO2zap	100	100.00	0.00
Hydrogen chloride	HCl_2e	100	100.00	0.00

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
2835.42	2836.75	4233.11	4238.62	2928.38	3099.97
846.88	847.77	1978.64	1979.53	976.37	1081.94

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TABLE 6-6 (con't)

Hot/Wet Analysis File for
Methyl ethyl ketone

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Ethylene dibromide	080a4ara.ds ^f	5.031	4.86	3.39
Ethylene dibromide	080a4arb.ds ^f	5.031	5.18	2.99
Ethylene dibromide	080a4arc.ds ^f	1.016	1.13	11.37
Ethylene dibromide	080a4ard.ds ^f	1.017	1.00	1.36
Ethylene dibromide	080a4are.ds ^f	0.203	0.20	0.54
Ethylene dibromide	080a4arf.ds ^f	0.202	0.19	4.90
Methyl ethyl ketone	109a4ara.ds ^f	5.062	5.03	0.67
Methyl ethyl ketone	109a4arb.ds ^f	5.062	5.12	1.15
Methyl ethyl ketone	109a4arc.ds ^f	1.011	0.92	9.28
Methyl ethyl ketone	109a4ard.ds ^f	1.017	0.99	2.93
Methyl ethyl ketone	109a4are.ds ^f	0.203	0.22	8.44
Methyl ethyl ketone	109a4arf.ds ^f	0.202	0.19	4.58
Toluene	153a4ara.ds ^f	5.072	4.97	2.05
Toluene	153a4arb.ds ^f	5.072	5.14	1.40
Toluene	153a4arc.ds ^f	1.013	1.09	7.93
Toluene	153a4ard.ds ^f	1.009	1.09	8.30
Vinylidene chloride	169b4asa.ds ^f	3.039	3.07	1.07
Vinylidene chloride	169b4asb.ds ^f	3.039	3.08	1.40
Vinylidene chloride	169b4asc.ds ^f	0.604	0.24	59.88
Vinylidene chloride	169b4ase.ds ^f	0.121	0.10	20.72
Vinylidene chloride	169b4ASF.ds ^f	0.121	0.07	43.92
Nitric oxide	NO2zap	10.1	10.10	0.00
Hydrogen chloride	HCl 2e	100	100.00	0.00

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower		Upper			
2831.7	2833.37	4292.56	4293.74	2872.76	3040.07
983.93	991.42	1277.98	1278.57	1140.7	1222.63

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Hot/Wet Analysis File for
Methyl methacrylate

TABLE 6-6 (con't)

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Ethyl chloride	079b4asa.ds ^f	2.997	3.00	0.04
Ethyl chloride	079b4asb.ds ^f	2.997	3.01	0.55
Ethyl chloride	079b4asc.ds ^f	0.604	0.57	5.25
Ethyl chloride	079b4asd.ds ^f	0.602	0.56	6.34
Ethyl chloride	079b4ase.ds ^f	0.121	0.10	15.25
Ethyl chloride	079b4ASF.ds ^f	0.121	0.11	8.00
Methyl bromide	106a4asb.ds ^f	4.919	4.92	0.06
Methyl bromide	106a4asc.ds ^f	4.919	4.94	0.38
Methyl bromide	106a4asd.ds ^f	1.017	0.96	5.34
Methyl bromide	106a4ase.ds ^f	1.018	0.97	4.93
Methyl iodide	111a4asa.ds ^f	4.95	4.96	0.26
Methyl iodide	111a4asb.ds ^f	4.95	4.95	0.02
Methyl iodide	111a4asc.ds ^f	1.02	0.98	3.51
Methyl iodide	111a4asd.ds ^f	1.016	0.99	2.98
Methyl methacrylate	114b4asa.ds ^f	3.051	3.04	0.41
Methyl methacrylate	114b4asb.ds ^f	3.051	3.06	0.42
Methyl methacrylate	114b4asc.ds ^f	0.604	0.61	0.83
Methyl methacrylate	114b4asd.ds ^f	0.603	0.60	0.03
Methyl methacrylate	114b4ase.ds ^f	0.123	0.11	12.05
Methyl methacrylate	114b4ASF.ds ^f	0.121	0.11	11.85
Nitric oxide	NO2zap	10.1	10.10	0.00
SF6	SF6_002	0.057	0.06	0.00
Hydrogen chloride	HCl_2e	100	100.00	0.00

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower		Upper		1137.5	1232.04
879.8	881.77	1249.71	1250.35		
2769.12	2770.84	3156.71	3158.49	2918.95	3019
874.18	875.22	2028.35	2030.51	915.64	962.12

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TABLE 6-6 (con't)

Hot/Wet Analysis File for
2-Nitropropane

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1ASF	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Ethylene dibromide	080a4ara.dsF	5.031	4.83	3.93
Ethylene dibromide	080a4arb.dsF	5.031	5.18	2.90
Ethylene dibromide	080a4arc.dsF	1.016	1.22	19.64
Ethylene dibromide	080a4ard.dsF	1.017	1.05	3.51
Ethylene dibromide	080a4are.dsF	0.203	0.25	22.46
Ethylene dibromide	080a4arf.dsF	0.202	0.25	25.42
Methyl chloroform	108a4asa.dsF	5.123	5.09	0.63
Methyl chloroform	108a4asb.dsF	5.123	5.18	1.07
Methyl chloroform	108a4asc.dsF	1.01	0.98	3.06
Methyl chloroform	108a4asd.dsF	1.012	0.93	8.62
Methyl chloroform	108a4ase.dsF	0.203	0.23	11.75
Methyl chloroform	108a4ASF	0.203	0.19	5.49
1-Nitropropane	124b4ana.dsF	3.013	2.97	1.34
2-Nitropropane	124b4anb.dsF	3.016	3.05	1.25
2-Nitropropane	124b4anc.dsF	0.604	0.59	1.88
2-Nitropropane	124b4and.dsF	0.603	0.63	4.06
2-Nitropropane	124b4ane.dsF	0.121	0.14	16.40
2-Nitropropane	124b4anf.dsF	0.124	0.11	10.58
Nitric oxide	NO2zap	10.1	10.10	0.00
Hydrogen chloride	HCl_2e	100	100.00	0.00

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
2816.9	2818.48	3070.97	3071.95	2875.79	3039.0
879.92	881.49	0	0	831.47	868.0

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TABLE 6-6 (con't)

**Hot/Wet Analysis File for
Propylene dichloride**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
1,3-Butadiene	023a4asa.ds ^f	5.092	5.12	0.50
1,3-Butadiene	023a4asb.ds ^f	5.092	5.07	0.42
1,3-Butadiene	023a4asc.ds ^f	1.006	1.01	0.05
1,3-Butadiene	023a4asd.ds ^f	1.023	1.01	1.45
1,3-Butadiene	023a4ase.ds ^f	0.205	0.20	2.06
1,3-Butadiene	023a4ASF.ds ^f	0.203	0.19	6.50
Propylene dichloride	142b4asa.ds ^f	3.045	3.05	0.16
Propylene dichloride	142b4asb.ds ^f	3.045	3.06	0.35
Propylene dichloride	142b4asc.ds ^f	0.598	0.57	5.18
Propylene dichloride	142b4asd.ds ^f	0.601	0.57	5.43
Propylene dichloride	142b4ase.ds ^f	0.121	0.09	21.86
Propylene dichloride	142b4ASF.ds ^f	0.121	0.07	39.48
Styrene	147a4asb.ds ^f	5.082	5.07	0.25
Styrene	147a4asc.ds ^f	1.015	1.11	8.90
Styrene	147a4asd.ds ^f	1.014	1.00	1.67
Styrene	147a4ase.ds ^f	0.202	0.18	12.65
Styrene	147a4ASF.ds ^f	0.203	0.18	10.96
Trichloroethylene	160a4asa.ds ^f	5.102	5.08	0.43
Trichloroethylene	160a4asb.ds ^f	5.102	5.20	1.90
Trichloroethylene	160a4asc.ds ^f	1.014	0.68	32.90
Trichloroethylene	160a4asd.ds ^f	1.016	0.98	4.02
Trichloroethylene	160a4ase.ds ^f	0.203	0.13	33.94
Trichloroethylene	160a4ASF.ds ^f	0.203	0.25	22.75
SF6	SF6_002	0.057	0.06	0.00
Nitric oxide	NO2zap	10.1	10.10	0.00
Hydrogen chloride	HCl_2e	100	100.00	0.00

Analytical Regions (wavenumbers)				Analytical Regions	
Baseline					
Lower		Upper			
867.02	869.51	1277.56	1278.74	996.86	1038
2836.35	2837.29	3159.89	3160.92	2927.59	3031.58

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Hot/Wet Analysis File for
1,1,2-Trichloroethane

TABLE 6-6 (con't)

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Carbon monoxide	197asm	376.1	376.10	0.00
SF6	SF6_002	0.059	0.06	0.00
Acrolein	006b4anb.ds ^f	3.017	2.98	1.22
Acrolein	006b4ane.ds ^f	0.604	0.70	15.34
Acrolein	006b4anf.ds ^f	0.603	0.70	15.63
Acrolein	006b4anh.ds ^f	0.121	0.11	9.09
Carbonyl sulfide	030a4asc.ds ^f	1.012	0.92	9.52
Carbonyl sulfide	030a4asd.ds ^f	1.017	0.96	6.05
Carbonyl sulfide	030a4ase.ds ^f	0.203	0.61	199.31
Carbonyl sulfide	030a4asd.ds ^f	0.203	0.59	188.27
Nitric oxide	NO2zap	10.1	10.10	0.00
Chlorobenzene	037a4ard.ds ^f	4.828	4.19	13.16
Chlorobenzene	037a4arf.ds ^f	1.033	2.65	156.51
Chlorobenzene	037a4arh.ds ^f	1.02	2.16	111.99
Chlorobenzene	037a4arj.ds ^f	0.203	1.35	563.02
1,1,2-Trichloroethane	159b4asa.ds ^f	3.033	3.03	0.19
1,1,2-Trichloroethane	159b4asb.ds ^f	3.033	3.04	0.34
1,1,2-Trichloroethane	159b4asc.ds ^f	0.602	0.59	1.59
1,1,2-Trichloroethane	159b4asd.ds ^f	0.604	0.59	1.55
1,1,2-Trichloroethane	159b4ase.ds ^f	0.12	0.11	7.28
1,1,2-Trichloroethane	159b4asf.ds ^f	0.121	0.11	8.63
Vinyl chloride	168a4asa.ds ^f	5.092	7.36	44.58
Vinyl chloride	168a4asb.ds ^f	5.092	1.47	71.16
Vinyl chloride	168a4asc.ds ^f	1.013	7.35	625.61
Vinyl chloride	168a4asd.ds ^f	1.023	1.47	43.27
Vinyl chloride	168a4ase.ds ^f	0.203	0.28	37.59
Hydrogen chloride	HCl 2e	20.1	20.10	0.00

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower	Upper	Lower	Upper	Lower	Upper
832.5	834	1252	1253.4	909.41	960.61
832.5	834	1252	1253.4	1181.99	1311.91

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TABLE 6-6 (con't)

Hot/Wet Analysis File for
Trichloroethylene

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
1,3-Butadiene	023a4asa.ds ^f	5.092	5.12	0.49
1,3-Butadiene	023a4asb.ds ^f	5.092	5.07	0.51
1,3-Butadiene	023a4asc.ds ^f	1.006	1.01	0.79
1,3-Butadiene	023a4asd.ds ^f	1.023	1.01	0.82
1,3-Butadiene	023a4ase.ds ^f	0.205	0.22	6.54
1,3-Butadiene	023a4ASF.ds ^f	0.203	0.22	8.43
Propylene dichloride	142b4asa.ds ^f	3.045	3.01	1.17
Propylene dichloride	142b4asb.ds ^f	3.045	3.09	1.55
Propylene dichloride	142b4asc.ds ^f	0.598	0.61	1.23
Propylene dichloride	142b4asd.ds ^f	0.601	0.54	10.12
Propylene dichloride	142b4ase.ds ^f	0.121	0.16	28.30
Propylene dichloride	142b4ASF.ds ^f	0.121	0.06	49.64
Styrene	147a4asb.ds ^f	5.082	5.05	0.69
Styrene	147a4ASC.ds ^f	1.015	1.15	12.87
Styrene	147a4asd.ds ^f	1.014	1.06	4.12
Styrene	147a4ASE.ds ^f	0.202	0.20	0.55
Styrene	147a4ASF.ds ^f	0.203	0.22	8.16
Trichloroethylene	160a4asa.ds ^f	5.102	5.08	0.54
Trichloroethylene	160a4asb.ds ^f	5.102	5.16	1.09
Trichloroethylene	160a4asc.ds ^f	1.014	0.91	10.56
Trichloroethylene	160a4asd.ds ^f	1.016	0.99	2.87
Trichloroethylene	160a4ase.ds ^f	0.203	0.19	5.81
Trichloroethylene	160a4ASF.ds ^f	0.203	0.19	6.89
SF6	SF6 002	0.057	0.06	0.00

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
821.43	823.39	867.02	869.51	826.25	860.91
867.02	869.51	1978.25	1979.58	919.7	959.88

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TABLE 6-6 (con't)

Hot/Wet Analysis File for
2.2,4-Trimethylpentane

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1ast	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Bromoform	022b4asc.dsf	0.605	0.44	27.80
Bromoform	022b4asd.dsf	0.604	0.68	12.86
Bromoform	022b4ase.dsf	0.121	0.30	151.65
Bromoform	022b4ast.dsf	0.121	0.39	224.63
Carbon tetrachloride	029a4asc.dsf	1.015	0.81	20.55
Carbon tetrachloride	029a4asd.dsf	1.016	0.94	7.40
Carbon tetrachloride	029a4ase.dsf	0.203	0.82	302.58
Carbon tetrachloride	029a4ast.dsf	0.203	0.86	322.57
Carbon tetrachloride	029a4asg.dsf	0.051	0.21	309.22
Carbon tetrachloride	029a4ash.dsf	0.052	0.48	818.67
Carbon disulfide	028a4asa.dsf	5.092	4.70	7.71
Carbon disulfide	028a4asb.dsf	5.092	4.18	17.95
Carbon disulfide	028a4asc.dsf	1.018	4.21	312.90
Carbon disulfide	028a4asd.dsf	1.014	3.86	280.93
Carbon disulfide	028a4asg.dsf	0.204	2.74	1243.04
2,2,4-Trimethylpentane	165a4asc.dsf	1.015	1.02	0.41
2,2,4-Trimethylpentane	165a4asd.dsf	1.015	1.01	0.24
2,2,4-Trimethylpentane	165a4ase.dsf	0.202	0.20	1.78
2,2,4-Trimethylpentane	165a4ast.dsf	0.203	0.20	2.43
m-Xylenes	172a4are.dsf	0.203	0.21	3.65
m-Xylenes	172a4arf.dsf	0.201	0.18	12.97
m-Xylenes	172a4arg.dsf	4.93	4.82	2.19
m-Xylenes	172a4arh.dsf	4.93	5.04	2.18
m-Xylenes	172a4ari.dsf	1.015	1.02	0.52
Nitric oxide	NO2zap	100	100.00	0.00
Hydrogen chloride	HCl_2e	100	100.00	0.00

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
2694.38	2696.18	3160.3	3161.01	2861.57	3009.23

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TABLE 6-6 (con't)

**Hot/Wet Analysis File for
Vinyl acetate**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	999.17	0.08
Sulfur dioxide	198c1ASF	25.791	25.76	0.14
Carbon dioxide	CO2a	11	11.10	0.94
Hexane	095a4asa.dsF	5.092	5.00	1.75
Hexane	095a4asc.dsF	1.021	1.42	38.82
Hexane	095a4ase.dsF	0.206	0.54	163.35
Methylene chloride	117a4asa.dsF	5.082	4.56	10.28
Methylene chloride	117a4asc.dsF	1.015	3.38	232.55
Methylene chloride	117a4ase.dsF	0.202	1.74	758.71
Propylene oxide	143b4ana.dsF	15.065	14.82	1.61
Propylene oxide	143b4anc.dsF	3.006	4.22	40.37
Vinyl acetate	166a4asa.dsF	5.082	5.06	0.41
Vinyl acetate	166a4asb.dsF	5.082	5.09	0.14
Vinyl acetate	166a4asc.dsF	1.013	1.04	2.86
Vinyl acetate	166a4asd.dsF	1.017	1.05	2.98
Vinyl acetate	166a4ase.dsF	0.203	0.19	7.80
Vinyl acetate	166a4ASF.dsF	0.203	0.23	13.08
p-Xylenes	173a4asa.dsF	5.102	5.01	1.85
p-Xylenes	173a4asc.dsF	1.007	1.57	56.04
p-Xylenes	173a4ase.dsF	0.204	-0.20	196.25
SF6	SF6 002	0.057	0.06	0.00

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower	Upper	Lower	Upper	Lower	Upper
1978.68	0	1979.58	0	823.23	906.69
1978.68	0	1979.58	0	919.53	1046.33

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TABLE 6-6 (con't)

Hot/Wet Analysis File for
Vinyl bromide

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Methyl chloride	107a4asa.ds ^f	5.092	5.08	0.20
Methyl chloride	107a4asb.ds ^f	5.092	5.11	0.34
Methyl chloride	107a4asc.ds ^f	1.014	0.99	2.03
Methyl chloride	107a4asd.ds ^f	1.018	1.00	1.87
Methyl chloride	107a4ase.ds ^f	0.204	0.21	2.18
Methyl chloride	107a4ast.ds ^f	0.203	0.21	3.58
Vinyl bromide	167a4asa.ds ^f	5.082	5.07	0.17
Vinyl bromide	167a4asb.ds ^f	5.082	5.08	0.01
Vinyl bromide	167a4asc.ds ^f	1.014	1.04	2.08
Vinyl bromide	167a4asd.ds ^f	1.017	1.04	1.84
Vinyl bromide	167a4ase.ds ^f	0.203	0.21	1.51
Vinyl bromide	167a4ast.ds ^f	0.203	0.21	1.65
Acetone	192a4arb.ds ^f	5.021	5.07	0.88
Acetone	192a4arc.ds ^f	1.014	0.90	10.92
Acetone	192a4ard.ds ^f	1.015	0.91	10.40
Acetone	192a4are.ds ^f	0.203	0.22	6.93
Acetone	192a4arf.ds ^f	0.203	0.18	11.56
Carbon dioxide	CO2a	11	11.00	0.00
SF6	SF6_002	0.057	0.06	0.00

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower		Upper			
836.88	838.23	1971.76	1974.16	990.35	1025.26
836.88	838.23	1971.76	1974.16	899.81	904.54
836.88	838.23	1971.76	1974.16	939.59	944.72

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TABLE 6-6 (con't)

**Hot/Wet Analysis File for
Vinyl chloride**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1asd	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
SF6	SF6_002	0.059	0.06	0.00
Nitric oxide	NO2zap	10.1	10.10	0.00
Acrolein	006b4anb.ds ^f	3.017	2.98	1.28
Acrolein	006b4ane.ds ^f	0.604	0.70	16.00
Acrolein	006b4anf.ds ^f	0.603	0.70	16.02
Acrolein	006b4anh.ds ^f	0.121	0.12	0.40
Carbonyl sulfide	030a4asc.ds ^f	1.012	1.00	1.18
Carbonyl sulfide	030a4asd.ds ^f	1.017	1.00	1.74
Carbonyl sulfide	030a4ase.ds ^f	0.203	0.28	36.08
Carbonyl sulfide	030a4asf.ds ^f	0.203	0.28	36.68
Carbon monoxide	197asm	100	100.00	0.00
Chlorobenzene	037a4ard.ds ^f	4.828	4.81	0.28
Chlorobenzene	037a4arf.ds ^f	1.033	1.10	6.44
Chlorobenzene	037a4arh.ds ^f	1.02	1.01	0.96
Chlorobenzene	037a4arj.ds ^f	0.203	0.24	17.29
1,1,2-Trichloroethane	159b4asa.ds ^f	3.033	3.03	0.22
1,1,2-Trichloroethane	159b4asb.ds ^f	3.033	3.04	0.32
1,1,2-Trichloroethane	159b4asc.ds ^f	0.602	0.60	1.21
1,1,2-Trichloroethane	159b4asd.ds ^f	0.604	0.60	0.98
1,1,2-Trichloroethane	159b4ase.ds ^f	0.12	0.12	3.73
Vinyl chloride	168a4asa.ds ^f	5.092	7.31	43.59
Vinyl chloride	168a4asb.ds ^f	5.092	1.52	70.25
Vinyl chloride	168a4asc.ds ^f	1.013	7.31	621.31
Vinyl chloride	168a4asd.ds ^f	1.023	1.50	46.89
Vinyl chloride	168a4ase.ds ^f	0.203	0.31	53.10
Vinyl chloride	168a4asf.ds ^f	0.211	0.31	45.05
Hydrogen chloride	HCl_2e	10.1	10.10	0.00

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower		Upper		852.81	1056.06
831	833	2535.83	2538.15	07/09/93	

TABLE 6-6 (con't)

**Hot/Wet Analysis File for
Vinylidene chloride**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Sulfur dioxide	198c1ASF	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Ethylene dibromide	080a4ara.dsF	5.031	4.87	3.12
Ethylene dibromide	080a4arb.dsF	5.031	5.16	2.53
Ethylene dibromide	080a4arc.dsF	1.016	1.11	9.52
Ethylene dibromide	080a4ard.dsF	1.017	1.05	2.83
Ethylene dibromide	080a4are.dsF	0.203	0.28	37.36
Ethylene dibromide	080a4arf.dsF	0.202	0.24	18.57
Methyl ethyl ketone	109a4ara.dsF	5.062	5.02	0.90
Methyl ethyl ketone	109a4arb.dsF	5.062	5.13	1.32
Methyl ethyl ketone	109a4arc.dsF	1.011	0.88	13.03
Methyl ethyl ketone	109a4ard.dsF	1.017	1.03	1.24
Methyl ethyl ketone	109a4are.dsF	0.203	0.21	2.46
Methyl ethyl ketone	109a4arf.dsF	0.202	0.27	30.94
Toluene	153a4ara.dsF	5.072	4.96	2.24
Toluene	153a4arb.dsF	5.072	5.18	2.16
Toluene	153a4arc.dsF	1.013	0.98	3.30
Toluene	153a4ard.dsF	1.009	1.06	5.36
Vinylidene chloride	169b4asa.dsF	3.039	3.02	0.57
Vinylidene chloride	169b4asb.dsF	3.039	3.05	0.34
Vinylidene chloride	169b4asc.dsF	0.604	0.64	5.59
Vinylidene chloride	169b4ase.dsF	0.121	0.13	3.52
Vinylidene chloride	169b4ASF	0.121	0.13	3.52

Analytical Regions (wavenumbers)

Baseline				Analytical Region:	
Lower		Upper			
831.81	832.41	1004.05	1004.59	834.13	898.1
1004.05	1004.59	1251.17	1255.11	1059.44	1113.0

07/09/

TABLE 6-6 (con't)

**Hot/Wet Analysis File for
p-Xylenes**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.04	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.03
Hexane	095a4asa.ds ^f	5.092	5.11	0.30
Hexane	095a4asc.ds ^f	1.021	0.95	7.30
Hexane	095a4ase.ds ^f	0.206	0.20	5.07
Methylene chloride	117a4asa.ds ^f	5.082	5.08	0.02
Methylene chloride	117a4asc.ds ^f	1.015	1.01	0.20
Methylene chloride	117a4ase.ds ^f	0.202	0.18	10.32
Propylene oxide	143b4ana.ds ^f	15.065	14.94	0.85
Propylene oxide	143b4anc.ds ^f	3.006	3.65	21.42
Vinyl acetate	166a4asa.ds ^f	5.082	5.09	0.07
Vinyl acetate	166a4asc.ds ^f	1.013	1.00	1.41
Vinyl acetate	166a4ase.ds ^f	0.203	0.19	8.15
p-Xylenes	173a4asa.ds ^f	5.102	4.98	2.35
p-Xylenes	173a4asb.ds ^f	5.102	5.25	2.95
p-Xylenes	173a4asc.ds ^f	1.007	0.91	9.43
p-Xylenes	173a4asd.ds ^f	1.018	0.96	5.45
p-Xylenes	173a4ase.ds ^f	0.204	0.19	6.84
Nitric oxide	NO2zap	10.1	10.10	0.00
Hydrogen chloride	HCl_2e	100	100.07	0.07

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower		Upper			
2559.43	2560.94	3159.88	3160.98	2854.43	3083.14
1978.64	0	1979.58	0	770.61	819.06
1978.64	0	1979.58	0	1082.58	1141.27

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TABLE 6-6 (con t)

Condenser Analysis File for
Allyl Chloride

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Acrylonitrile	009a4ara.ds ^f	4.991	4.96	0.56
Acrylonitrile	009a4arb.ds ^f	4.991	5.01	0.42
Acrylonitrile	009a4arc.ds ^f	1.006	1.03	2.43
Acrylonitrile	009a4ard.ds ^f	1.014	1.02	0.55
Acrylonitrile	009a4are.ds ^f	0.203	0.22	7.99
Acrylonitrile	009a4arf.ds ^f	0.2	0.21	5.33
Allyl Chloride	010b4asa.ds ^f	3.093	3.11	0.37
Allyl Chloride	010b4asb.ds ^f	3.093	3.10	0.21
Allyl Chloride	010b4asc.ds ^f	0.601	0.56	6.43
Allyl Chloride	010b4asd.ds ^f	0.602	0.55	9.15
Ethyl benzene	077a4ara.ds ^f	5.113	5.17	1.11
Ethyl benzene	077a4arb.ds ^f	5.113	5.24	2.56
Ethyl benzene	077a4arc.ds ^f	1.014	0.46	54.82
Ethyl benzene	077a4ard.ds ^f	1.017	0.80	21.66
Ethyl benzene	077a4arf.ds ^f	0.203	-0.63	409.99
o-Xylenes	171a4asa.ds ^f	5.072	5.23	3.19
o-Xylenes	171a4asb.ds ^f	5.072	5.26	3.79
o-Xylenes	171a4asc.ds ^f	1.015	0.70	31.20
o-Xylenes	171a4asd.ds ^f	1.016	0.17	82.97
o-Xylenes	171a4ase.ds ^f	0.203	-1.28	731.50
o-Xylenes	171a4ASF.ds ^f	0.203	-1.35	761.54
SF6	SF6_002	0.057	0.06	0.00

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower		Upper			
873.86	875.12	2143.24	2143.78	893.51	1002.2
873.86	875.12	2143.24	2143.78	1241.86	1301.7

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TABLE 6-6 (con't)

Condenser Analysis File for
Benzene

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Acetonitrile	003a4ara.ds ^f	4.97	4.90	1.36
Acetonitrile	003a4arb.ds ^f	4.97	4.96	0.15
Acetonitrile	003a4arc.ds ^f	1.006	1.25	24.14
Acetonitrile	003a4ard.ds ^f	1.015	1.14	12.58
Benzene	015a4ara.ds ^f	5.052	5.05	0.10
Benzene	015a4arb.ds ^f	5.052	5.07	0.39
Benzene	015a4arc.ds ^f	1.036	1.01	2.80
Benzene	015a4ard.ds ^f	1.016	0.97	4.34
Methanol	104a4asa.ds ^f	5.113	5.10	0.20
Methanol	104a4asb.ds ^f	5.113	5.14	0.50
Methanol	104a4asc.ds ^f	1.016	0.98	3.44
Methanol	104a4asd.ds ^f	1.016	0.98	3.41
Methanol	104a4ase.ds ^f	0.203	0.20	4.06
Methanol	104a4ASF.ds ^f	0.206	0.18	12.13
Methyl isobutyl ketone	112a4ara.ds ^f	5.031	4.95	1.55
Methyl isobutyl ketone	112a4arb.ds ^f	5.031	5.12	1.68
Methyl isobutyl ketone	112a4arc.ds ^f	1.014	1.16	13.82
Methyl isobutyl ketone	112a4ard.ds ^f	1.012	1.02	0.24
Methyl isobutyl ketone	112a4are.ds ^f	0.202	-0.15	174.85
Methyl isobutyl ketone	112a4arf.ds ^f	0.203	-0.32	255.35
Tetrachloroethylene	151a4asa.ds ^f	4.574	4.58	0.07
Tetrachloroethylene	151a4asb.ds ^f	4.574	3.96	13.33
Tetrachloroethylene	151a4asd.ds ^f	1.013	2.90	185.66
Tetrachloroethylene	151a4ase.ds ^f	0.203	2.55	1154.98
Tetrachloroethylene	151a4ASF.ds ^f	0.203	2.12	944.92

Analytical Regions (wavenumbers)				Analytical Regions	
Baseline					
Lower		Upper			
2759	2760.92	3156.59	3157.38	3020.15	3124.44
873.39	875.8	1978.93	1979.78	1010.22	1063.18

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TABLE 6-6 (con't)

Condenser Analysis File for
Chlorobenzene

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1ast	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Carbon monoxide	197asm	376.1	376.10	0.00
SF6	SF6_002	0.057	0.06	0.00
Acrolein	006b4anb.ds ^f	3.017	2.98	1.23
Acrolein	006b4ane.ds ^f	0.604	0.78	29.73
Acrolein	006b4anf.ds ^f	0.603	0.55	9.25
Acrolein	006b4anh.ds ^f	0.121	0.43	259.75
Carbonyl sulfide	030a4asc.ds ^f	1.012	0.95	6.04
Carbonyl sulfide	030a4asd.ds ^f	1.017	0.95	6.51
Carbonyl sulfide	030a4ase.ds ^f	0.203	0.51	148.35
Carbonyl sulfide	030a4ast.ds ^f	0.203	0.54	164.55
Chlorobenzene	037a4arc.ds ^f	4.828	5.10	5.59
Chlorobenzene	037a4ard.ds ^f	4.828	4.58	5.11
Chlorobenzene	037a4arf.ds ^f	1.033	1.01	2.41
Chlorobenzene	037a4arh.ds ^f	1.02	0.94	8.39
Chlorobenzene	037a4arj.ds ^f	0.203	0.21	2.58
1,1,2-Trichloroethane	159b4asa.ds ^f	3.033	2.71	10.71
1,1,2-Trichloroethane	159b4asb.ds ^f	3.033	3.05	0.68
1,1,2-Trichloroethane	159b4asc.ds ^f	0.602	1.24	106.13
1,2-Trichloroethane	159b4asd.ds ^f	0.604	1.33	120.48
1,1,2-Trichloroethane	159b4ase.ds ^f	0.12	0.94	681.86
Nitric oxide	NO2zap	10.1	10.10	0.00
Vinyl chloride	168a4asa.ds ^f	5.092	7.38	44.94
Vinyl chloride	168a4asb.ds ^f	5.092	1.44	71.64
Vinyl chloride	168a4asc.ds ^f	1.013	7.41	630.73
Vinyl chloride	168a4asd.ds ^f	1.023	1.44	40.78
Vinyl chloride	168a4ase.ds ^f	0.203	0.29	43.18

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower		Upper		1012.42	1036.64
833.14	833.98	1977.71	1979.58	3029.76	3113.07
2629.56	2634.09	3144.53	3146.79		

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TABLE 6-6 (con't)

Condenser Analysis File for
Ethyl benzene

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1ASF	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Acrylonitrile	009a4ara.dsF	4.991	4.77	4.47
Acrylonitrile	009a4arb.dsF	4.991	4.99	0.02
Acrylonitrile	009a4arc.dsF	1.006	1.66	65.21
Acrylonitrile	009a4ard.dsF	1.014	1.36	33.55
Acrylonitrile	009a4are.dsF	0.203	0.44	118.58
Acrylonitrile	009a4arf.dsF	0.2	0.52	161.63
Allyl Chloride	010b4asa.dsF	3.093	3.10	0.23
Allyl Chloride	010b4asb.dsF	3.093	3.10	0.21
Allyl Chloride	010b4asc.dsF	0.601	0.58	3.96
Allyl Chloride	010b4asd.dsF	0.602	0.56	7.73
Ethyl benzene	077a4ara.dsF	5.113	4.95	3.23
Ethyl benzene	077a4arb.dsF	5.113	5.25	2.60
Ethyl benzene	077a4arc.dsF	1.014	1.13	11.39
Ethyl benzene	077a4ard.dsF	1.017	1.06	3.83
Ethyl benzene	077a4arf.dsF	0.203	0.24	17.65
o-Xylenes	171a4asa.dsF	5.072	5.02	1.02
o-Xylenes	171a4asb.dsF	5.072	5.12	0.88
o-Xylenes	171a4asc.dsF	1.015	0.99	2.29
o-Xylenes	171a4asd.dsF	1.016	1.05	2.81
o-Xylenes	171a4ase.dsF	0.203	0.27	33.73
o-Xylenes	171a4ASF	0.203	0.28	39.03
Nitric oxide	NO2zap	10.1	10.10	0.00

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
2760.28	2761.12	3160.11	3161.29	2854.28	3122.12

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TABLE 6-6 (con't)

Condenser Analysis File for
Ethyl chloride

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1ast	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Ethyl chloride	079b4asa.ds ^f	2.997	3.09	3.13
Ethyl chloride	079b4asb.ds ^f	2.997	3.03	1.04
Ethyl chloride	079b4asc.ds ^f	0.604	0.43	28.66
Ethyl chloride	079b4asd.ds ^f	0.602	0.15	75.07
Ethyl chloride	079b4ase.ds ^f	0.121	0.13	8.21
Ethyl chloride	079b4ast.ds ^f	0.121	0.13	5.65
Methyl bromide	106a4asb.ds ^f	4.919	4.94	0.34
Methyl bromide	106a4asc.ds ^f	4.919	4.95	0.67
Methyl bromide	106a4asd.ds ^f	1.017	0.89	12.57
Methyl bromide	106a4ase.ds ^f	1.018	0.91	11.12
Methyl iodide	111a4asa.ds ^f	4.95	4.96	0.25
Methyl iodide	111a4asb.ds ^f	4.95	4.95	0.06
Methyl iodide	111a4asc.ds ^f	1.02	1.00	2.10
Methyl iodide	111a4asd.ds ^f	1.016	0.97	5.09
Methyl methacrylate	114b4asa.ds ^f	3.051	3.09	1.38
Methyl methacrylate	114b4asb.ds ^f	3.051	3.06	0.37
Methyl methacrylate	114b4asc.ds ^f	0.604	0.49	18.89
Methyl methacrylate	114b4asd.ds ^f	0.603	0.48	19.84
Methyl methacrylate	114b4ase.ds ^f	0.123	-0.01	104.80
Methyl methacrylate	114b4ASF.ds ^f	0.121	0.07	39.55
Nitric oxide	NO2zap	10.1	10.10	0.00
SF6	SF6_002	0.057	0.06	0.00

Analytical Regions (wavenumbers)				Analytical Regions	
Baseline					
Lower		Upper			
2545.12	2586.87	4310.76	4311.84	2916.56	3041.03
1006.16	1006.66	2159.49	2159.79	1263.97	1312.02
874.31	875.59	1006.16	1006.66	943.43	1000.16

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TABLE 6-6 (con't)

Condenser Analysis File for
Ethylene dibromide

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1ASF	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Ethylene dibromide	080a4ara.dsF	5.031	4.86	3.38
Ethylene dibromide	080a4arb.dsF	5.031	5.18	2.92
Ethylene dibromide	080a4arc.dsF	1.016	1.14	12.07
Ethylene dibromide	080a4ard.dsF	1.017	1.01	0.75
Ethylene dibromide	080a4are.dsF	0.203	0.21	1.37
Ethylene dibromide	080a4arf.dsF	0.202	0.20	2.44
Methyl chloroform	108a4asa.dsF	5.123	5.09	0.65
Methyl chloroform	108a4asb.dsF	5.123	5.17	0.84
Methyl chloroform	108a4asc.dsF	1.01	1.08	6.53
Methyl chloroform	108a4asd.dsF	1.012	0.91	9.92
Methyl chloroform	108a4ase.dsF	0.203	0.17	16.07
Methyl chloroform	108a4ASF	0.203	0.16	21.84
2-Nitropropane	124b4ana.dsF	3.013	3.00	0.55
2-Nitropropane	124b4anb.dsF	3.016	2.59	14.19
2-Nitropropane	124b4anc.dsF	- 0.604	1.00	65.77
2-Nitropropane	124b4and.dsF	0.603	2.28	277.95
2-Nitropropane	124b4ane.dsF	0.121	0.53	338.22
2-Nitropropane	124b4anf.dsF	0.124	0.46	267.44

Analytical Regions (wavenumbers)

Baseline

Lower	Upper	Analytical Regions	
868.55	869.92	2536.6	2541.32
868.55	869.92	2536.6	2541.32

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TABLE 6-6 (con't)

Condenser Analysis File for
Hexane

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Nitric oxide	NO2zap	10.1	10.10	0.00
Hexane	095a4asa.ds ^f	5.092	5.08	0.17
Hexane	095a4asb.ds ^f	5.092	5.11	0.33
Hexane	095a4asc.ds ^f	1.021	0.96	6.37
Hexane	095a4asd.ds ^f	1.02	1.04	2.42
Hexane	095a4ase.ds ^f	0.206	0.20	4.00
Hexane	095a4asf.ds ^f	0.203	0.20	0.99
Methylene chloride	117a4asa.ds ^f	5.082	5.06	0.44
Methylene chloride	117a4asb.ds ^f	5.082	5.09	0.14
Methylene chloride	117a4asc.ds ^f	1.015	1.08	6.32
Methylene chloride	117a4asd.ds ^f	0.972	1.00	2.53
Methylene chloride	117a4ase.ds ^f	0.202	0.10	50.05
Methylene chloride	117a4asf.ds ^f	0.201	0.25	21.68
Propylene oxide	143b4ana.ds ^f	15.065	14.96	0.71
Propylene oxide	143b4anb.ds ^f	15.086	15.09	0.03
Propylene oxide	143b4and.ds ^f	3.018	3.53	16.88
Vinyl acetate	166a4asa.ds ^f	5.082	5.04	0.92
Vinyl acetate	166a4asb.ds ^f	5.082	5.06	0.41
Vinyl acetate	166a4asc.ds ^f	1.013	1.16	14.03
Vinyl acetate	166a4asd.ds ^f	1.017	1.14	11.60
Vinyl acetate	166a4ase.ds ^f	0.203	0.42	105.04
Vinyl acetate	166a4asf.ds ^f	0.203	0.38	86.52
p-Xylenes	173a4asa.ds ^f	5.102	4.99	2.28
p-Xylenes	173a4asb.ds ^f	5.102	5.25	2.92
p-Xylenes	173a4asc.ds ^f	1.007	0.90	10.35
p-Xylenes	173a4asd.ds ^f	1.018	0.96	5.90

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
2556.39	2557.97	3159.84	3160.97	2835.27	3005.43

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TABLE 6-6 (con't)

Condenser Analysis File for
Methyl bromide

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Ethyl chloride	079b4asa.ds ^f	2.997	3.01	0.28
Ethyl chloride	079b4asb.ds ^f	2.997	3.00	0.15
Ethyl chloride	079b4asc.ds ^f	0.604	0.59	3.09
Ethyl chloride	079b4asd.ds ^f	0.602	0.56	7.03
Ethyl chloride	079b4ase.ds ^f	0.121	0.12	2.47
Ethyl chloride	079b4ASF.ds ^f	0.121	0.12	4.84
Methyl bromide	106a4asb.ds ^f	4.919	4.95	0.64
Methyl bromide	106a4asc.ds ^f	4.919	4.91	0.26
Methyl bromide	106a4asd.ds ^f	1.017	0.98	3.78
Methyl bromide	106a4ase.ds ^f	1.018	0.97	5.18
Methyl iodide	111a4asa.ds ^f	4.95	4.98	0.50
Methyl iodide	111a4asb.ds ^f	4.95	4.94	0.19
Methyl iodide	111a4asc.ds ^f	1.02	0.99	3.41
Methyl iodide	111a4asd.ds ^f	1.016	0.98	3.89
Methyl methacrylate	114b4asa.ds ^f	3.051	3.04	0.50
Methyl methacrylate	114b4asb.ds ^f	3.051	3.06	0.36
Methyl methacrylate	114b4asc.ds ^f	0.604	0.61	1.70
Methyl methacrylate	114b4asd.ds ^f	0.603	0.61	1.75
Methyl methacrylate	114b4ase.ds ^f	0.123	0.13	4.94
Methyl methacrylate	114b4ASF.ds ^f	0.121	0.12	3.87
Nitric oxide	NO2zap	10.1	10.10	0.00

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower		Upper		2938.47	3008.44
2805.09	2811.39	3155.26	3165.9	07/09/93	

TABLE 6-6 (con't)

**Condenser Analysis File for
Methyl chloride**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.02	0.00
Methyl chloride	107a4asa.ds ^f	5.092	5.08	0.20
Methyl chloride	107a4asb.ds ^f	5.092	5.09	0.01
Methyl chloride	107a4asc.ds ^f	1.014	1.05	3.48
Methyl chloride	107a4asd.ds ^f	1.018	1.03	0.63
Methyl chloride	107a4ase.ds ^f	0.204	0.23	11.79
Methyl chloride	107a4ASF.ds ^f	0.203	0.22	9.84
Vinyl bromide	167a4asa.ds ^f	5.082	5.06	0.37
Vinyl bromide	167a4asb.ds ^f	5.082	5.07	0.28
Vinyl bromide	167a4asc.ds ^f	1.014	1.09	7.86
Vinyl bromide	167a4asd.ds ^f	1.017	1.09	7.00
Vinyl bromide	167a4ase.ds ^f	0.203	0.25	25.01
Vinyl bromide	167a4ASF.ds ^f	0.203	0.22	8.45
Acetone	192a4arb.ds ^f	5.021	5.07	0.98
Acetone	192a4arc.ds ^f	1.014	0.91	10.27
Acetone	192a4ard.ds ^f	1.015	0.92	9.02
Acetone	192a4are.ds ^f	0.203	0.10	52.49
Acetone	192a4arf.ds ^f	0.203	0.08	62.28
Sulfur dioxide	198c1ASF	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
SF6	SF6_002	0.057	0.06	0.00
Nitric oxide	NO2zap	10.1	10.10	0.00

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower		Upper			
2835.42	2 ^r	3.75	4233.11	4238.62	2928.38
846.88	3~7.77		1978.64	1979.53	3099.97

07/09/93

TABLE 6-6 (con't)

Condenser Analysis File for
Methyl ethyl ketone

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Ethylene dibromide	080a4ara.ds ^f	5.031	4.86	3.39
Ethylene dibromide	080a4arb.ds ^f	5.031	5.18	2.99
Ethylene dibromide	080a4arc.ds ^f	1.016	1.13	11.39
Ethylene dibromide	080a4ard.ds ^f	1.017	1.00	1.32
Ethylene dibromide	080a4are.ds ^f	0.203	0.20	0.42
Ethylene dibromide	080a4arf.ds ^f	0.202	0.19	4.73
Methyl ethyl ketone	109a4ara.ds ^f	5.062	5.03	0.67
Methyl ethyl ketone	109a4arb.ds ^f	5.062	5.12	1.14
Methyl ethyl ketone	109a4arc.ds ^f	1.011	0.92	9.25
Methyl ethyl ketone	109a4ard.ds ^f	1.017	0.99	2.87
Methyl ethyl ketone	109a4are.ds ^f	0.203	0.22	8.43
Methyl ethyl ketone	109a4arf.ds ^f	0.202	0.19	4.81
Toluene	153a4ara.ds ^f	5.072	4.97	2.08
Toluene	153a4arb.ds ^f	5.072	5.14	1.41
Toluene	153a4arc.ds ^f	1.013	1.10	8.21
Toluene	153a4ard.ds ^f	1.009	1.10	8.60
Vinylidene chloride	169b4asa.ds ^f	3.039	3.07	1.05
Vinylidene chloride	169b4asb.ds ^f	3.039	3.08	1.39
Vinylidene chloride	169b4asc.ds ^f	0.604	0.25	59.37
Vinylidene chloride	169b4ase.ds ^f	0.121	0.10	21.42
Vinylidene chloride	169b4asf.ds ^f	0.121	0.07	43.53
Nitric oxide	NO2zap	10.1	10.10	0.00

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
2831.7	2833.37	4292.56	4293.74	2872.76	3040.07
983.93	991.42	1277.98	1278.57	1140.7	1222.63

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TABLE 6-6 (con't)

**Condenser Analysis File for
Methyl isobutyl ketone**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Acetonitrile	003a4ara.ds ^f	4.97	4.77	4.05
Acetonitrile	003a4arb.ds ^f	4.97	4.67	5.99
Acetonitrile	003a4arc.ds ^f	1.006	2.70	168.30
Acetonitrile	003a4ard.ds ^f	1.015	1.78	75.24
Benzene	015a4ara.ds ^f	5.052	5.09	0.76
Benzene	015a4arb.ds ^f	5.052	5.06	0.17
Benzene	015a4arc.ds ^f	1.036	1.02	2.02
Benzene	015a4ard.ds ^f	1.016	0.80	20.99
Methanol	104a4asa.ds ^f	5.113	5.09	0.54
Methanol	104a4asb.ds ^f	5.113	5.16	0.92
Methanol	104a4asc.ds ^f	1.016	0.98	4.09
Methanol	104a4asd.ds ^f	1.016	0.97	4.57
Methanol	104a4ase.ds ^f	0.203	0.19	7.44
Methanol	104a4ASF.ds ^f	0.206	0.17	16.58
Methyl isobutyl ketone	112a4ara.ds ^f	5.031	4.94	1.78
Methyl isobutyl ketone	112a4arb.ds ^f	5.031	5.13	1.89
Methyl isobutyl ketone	112a4arc.ds ^f	1.014	1.00	1.29
Methyl isobutyl ketone	112a4ard.ds ^f	1.012	1.00	1.40
Methyl isobutyl ketone	112a4are.ds ^f	0.202	0.20	3.78
Methyl isobutyl ketone	112a4arf.ds ^f	0.203	0.20	0.01
Tetrachloroethylene	151a4asa.ds ^f	4.574	4.47	2.31
Tetrachloroethylene	151a4asb.ds ^f	4.574	4.56	0.24
Tetrachloroethylene	151a4asd.ds ^f	1.013	1.27	25.30
Tetrachloroethylene	151a4ase.ds ^f	0.203	1.22	499.75
Tetrachloroethylene	151a4ASF.ds ^f	0.203	0.52	157.93
Nitric oxide	NO2zap	10.1	10.10	0.00

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Region
868.69	869.58	1978.89	1979.78	1144.42 1207
2783.82	2788.35	3157.82	3161.17	2872.05 2994

07/09

TABLE 6-6 (con't)

Condenser Analysis File for
Methyl methacrylate

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1ASF	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Ethyl chloride	079b4asa.dsF	2.997	2.99	0.10
Ethyl chloride	079b4asb.dsF	2.997	3.01	0.51
Ethyl chloride	079b4asc.dsF	0.604	0.58	4.36
Ethyl chloride	079b4asd.dsF	0.602	0.57	5.21
Ethyl chloride	079b4ase.dsF	0.121	0.11	11.38
Ethyl chloride	079b4ASF.dsF	0.121	0.12	4.68
Methyl bromide	106a4asb.dsF	4.919	4.93	0.18
Methyl bromide	106a4asc.dsF	4.919	4.94	0.42
Methyl bromide	106a4asd.dsF	1.017	0.94	7.90
Methyl bromide	106a4ase.dsF	1.018	0.96	6.11
Methyl iodide	111a4asa.dsF	4.95	4.96	0.18
Methyl iodide	111a4asb.dsF	4.95	4.95	0.01
Methyl iodide	111a4asc.dsF	1.02	1.00	2.18
Methyl iodide	111a4asd.dsF	1.016	0.99	2.23
Methyl methacrylate	114b4asa.dsF	3.051	3.04	0.41
Methyl methacrylate	114b4asb.dsF	3.051	3.06	0.43
Methyl methacrylate	114b4asc.dsF	0.604	0.61	0.63
Methyl methacrylate	114b4asd.dsF	0.603	0.60	0.11
Methyl methacrylate	114b4ase.dsF	0.123	0.11	11.72
Methyl methacrylate	114b4ASF.dsF	0.121	0.11	11.71
Nitric oxide	NO2zap	10.1	10.10	0.00
SF6	SF6_002	0.057	0.06	0.00

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
879.8	881.77	1249.71	1250.35	1137.5	1232.04
2769.12	2770.84	3156.71	3158.49	2918.95	3019
874.18	875.22	2028.35	2030.51	915.64	962.12

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TABLE 6-6 (con't)

**Condenser Analysis File for
Methylene chloride**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1bvb	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Hexane	095a4asa.ds ^f	5.092	5.09	0.02
Hexane	095a4asb.ds ^f	5.092	5.11	0.24
Hexane	095a4asc.ds ^f	1.021	0.95	6.83
Hexane	095a4asd.ds ^f	1.02	1.03	1.28
Hexane	095a4ase.ds ^f	0.206	0.20	1.24
Hexane	095a4ASF.ds ^f	0.203	0.21	2.10
Methylene chloride	117a4asa.ds ^f	5.082	5.05	0.62
Methylene chloride	117a4asb.ds ^f	5.082	5.12	0.76
Methylene chloride	117a4asc.ds ^f	1.015	1.00	1.13
Methylene chloride	117a4asd.ds ^f	0.972	0.95	2.32
Methylene chloride	117a4ase.ds ^f	0.202	0.18	8.99
Methylene chloride	117a4ASF.ds ^f	0.201	0.20	0.60
Propylene oxide	143b4ana.ds ^f	15.065	14.93	0.88
Propylene oxide	143b4anb.ds ^f	15.086	15.16	0.46
Propylene oxide	143b4and.ds ^f	3.018	3.34	10.60
Vinyl acetate	166a4asa.ds ^f	5.082	5.08	0.11
Vinyl acetate	166a4asb.ds ^f	5.082	5.11	0.59
Vinyl acetate	166a4asc.ds ^f	1.013	0.96	5.17
Vinyl acetate	166a4asd.ds ^f	1.017	0.97	5.03
Vinyl acetate	166a4ase.ds ^f	0.203	0.16	21.28
Vinyl acetate	166a4ASF.ds ^f	0.203	0.16	22.86
p-Xylenes	173a4asa.ds ^f	5.102	4.96	2.72
p-Xylenes	173a4asb.ds ^f	5.102	5.26	2.98
p-Xylenes	173a4asc.ds ^f	1.007	0.93	7.50
p-Xylenes	173a4asd.ds ^f	1.018	1.03	0.83
Nitric oxide	NO2zap	10.1	10.10	0.00

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Region	
837.28	838.41	1978.69	1979.78	1241.32	1290
2559.44	2560.23	4178.26	0	2952.01	3045

07/09

TABLE 6-6 (con't)

Condenser Analysis File for
2-Nitropropane

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1ASF	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Ethylene dibromide	080a4ara.dsF	5.031	4.83	3.92
Ethylene dibromide	080a4arb.dsF	5.031	5.18	2.95
Ethylene dibromide	080a4arc.dsF	1.016	1.21	19.03
Ethylene dibromide	080a4ard.dsF	1.017	1.05	3.06
Ethylene dibromide	080a4are.dsF	0.203	0.25	20.95
Ethylene dibromide	080a4arf.dsF	0.202	0.25	23.37
Methyl chloroform	108a4asa.dsF	5.123	5.09	0.64
Methyl chloroform	108a4asb.dsF	5.123	5.18	1.09
Methyl chloroform	108a4asc.dsF	1.01	0.98	3.05
Methyl chloroform	108a4asd.dsF	1.012	0.93	8.61
Methyl chloroform	108a4ase.dsF	0.203	0.23	12.16
Methyl chloroform	108a4ASF	0.203	0.19	5.22
2-Nitropropane	124b4ana.dsF	3.013	2.97	1.34
2-Nitropropane	124b4anb.dsF	3.016	3.05	1.23
2-Nitropropane	124b4anc.dsF	0.604	0.59	1.81
2-Nitropropane	124b4and.dsF	0.603	0.63	4.40
2-Nitropropane	124b4ane.dsF	0.121	0.14	16.87
2-Nitropropane	124b4anf.dsF	0.124	0.11	11.06
Nitric oxide	NO2zap	10.1	10.10	0.00

Analytical Regions (wavenumbers)				Analytical Regions	
Baseline					
Lower		Upper			
2816.9	2818.48	3070.97	3071.95	2875.79	3039.65
879.92	881.49	0	0	831.47	868.5

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TABLE 6-6 (con't)

Condenser Analysis File for
Propylene dichloride

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1ast	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
1,3-Butadiene	023a4asa.ds ^f	5.092	5.12	0.50
1,3-Butadiene	023a4asb.ds ^f	5.092	5.07	0.42
1,3-Butadiene	023a4asc.ds ^f	1.006	1.01	0.06
1,3-Butadiene	023a4asd.ds ^f	1.023	1.01	1.44
1,3-Butadiene	023a4ase.ds ^f	0.205	0.20	2.12
1,3-Butadiene	023a4ASF.ds ^f	0.203	0.19	6.62
Propylene dichloride	142b4asa.ds ^f	3.045	3.05	0.14
Propylene dichloride	142b4asb.ds ^f	3.045	3.06	0.37
Propylene dichloride	142b4asc.ds ^f	0.598	0.57	5.06
Propylene dichloride	142b4asd.ds ^f	0.601	0.57	5.53
Propylene dichloride	142b4ase.ds ^f	0.121	0.09	22.42
Propylene dichloride	142b4ASF.ds ^f	0.121	0.07	41.45
Styrene	147a4asb.ds ^f	5.082	5.07	0.21
Styrene	147a4asc.ds ^f	1.015	1.10	8.49
Styrene	147a4asd.ds ^f	1.014	0.99	2.19
Styrene	147a4ase.ds ^f	0.202	0.17	14.00
Styrene	147a4ASF.ds ^f	0.203	0.18	12.99
Trichloroethylene	160a4asa.ds ^f	5.102	5.09	0.17
Trichloroethylene	160a4asb.ds ^f	5.102	5.22	2.20
Trichloroethylene	160a4asc.ds ^f	1.014	0.59	42.07
Trichloroethylene	160a4asd.ds ^f	1.016	0.95	6.97
Trichloroethylene	160a4ase.ds ^f	0.203	0.08	60.86
Chloroethylene	160a4ASF.ds ^f	0.203	0.20	0.21
--	SF6_002	0.057	0.06	0.00
--	NO2zap	10.1	10.10	0.00

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
867.02	869.51	1277.56	1278.74	996.86	1036
2836.35	2837.29	3159.89	3160.92	2927.59	3031.58

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TABLE 6-6 (con't)

Condenser Analysis File for
Styrene

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
1,3-Butadiene	023a4asa.ds ^f	5.092	5.08	0.32
1,3-Butadiene	023a4asb.ds ^f	5.092	5.08	0.28
1,3-Butadiene	023a4asc.ds ^f	1.006	1.09	8.21
1,3-Butadiene	023a4asd.ds ^f	1.023	1.09	6.34
1,3-Butadiene	023a4ase.ds ^f	0.205	0.22	7.13
1,3-Butadiene	023a4ASF.ds ^f	0.203	0.21	5.43
Propylene dichloride	142b4asa.ds ^f	3.045	3.05	0.22
Propylene dichloride	142b4asb.ds ^f	3.045	3.04	0.15
Propylene dichloride	142b4asc.ds ^f	0.598	0.60	0.41
Propylene dichloride	142b4asd.ds ^f	0.601	0.60	1.02
Propylene dichloride	142b4ase.ds ^f	0.121	0.11	9.12
Propylene dichloride	142b4ASF.ds ^f	0.121	0.12	0.47
Styrene	147a4asb.ds ^f	5.082	5.07	0.20
Styrene	147a4asc.ds ^f	1.015	1.10	8.77
Styrene	147a4asd.ds ^f	1.014	0.99	2.43
Styrene	147a4ase.ds ^f	0.202	0.17	14.08
Styrene	147a4ASF.ds ^f	0.203	0.17	16.86
Trichloroethylene	160a4asa.ds ^f	5.102	5.08	0.50
Trichloroethylene	160a4asb.ds ^f	5.102	5.16	1.08
Trichloroethylene	160a4asc.ds ^f	1.014	0.91	10.72
Trichloroethylene	160a4asd.ds ^f	1.016	0.98	3.72
Trichloroethylene	160a4ase.ds ^f	0.203	0.20	3.91
Trichloroethylene	160a4ASF.ds ^f	0.203	0.20	4.30
SF6	SF6_002	0.057	0.06	0.00

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
867.02	869.51	1978.4	1979.78	886.32	931.22
867.02	869.51	1978.4	1979.78	966.67	1006.85

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**Condenser Analysis File for
Tetrachloroethylene**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1ASF	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Acetonitrile	003a4ara.dsF	4.97	4.94	0.68
Acetonitrile	003a4arb.dsF	4.97	5.03	1.27
Acetonitrile	003a4arc.dsF	1.006	1.01	0.49
Acetonitrile	003a4ard.dsF	1.015	0.86	15.01
Benzene	015a4ara.dsF	5.052	4.67	7.47
Benzene	015a4arb.dsF	5.052	4.26	15.75
Benzene	015a4arc.dsF	1.036	4.26	311.47
Benzene	015a4ard.dsF	1.016	3.56	250.31
Methanol	104a4asa.dsF	5.113	5.04	1.49
Methanol	104a4asb.dsF	5.113	5.15	0.67
Methanol	104a4asc.dsF	1.016	1.10	7.77
Methanol	104a4asd.dsF	1.016	1.22	20.28
Methanol	104a4ase.dsF	0.203	0.02	88.94
Methanol	104a4ASF.dsF	0.206	0.04	82.24
Methyl isobutyl ketone	112a4ara.dsF	5.031	4.78	4.92
Methyl isobutyl ketone	112a4arb.dsF	5.031	5.45	8.31
Methyl isobutyl ketone	112a4arc.dsF	1.014	0.89	12.19
Methyl isobutyl ketone	112a4ard.dsF	1.012	0.43	57.78
Methyl isobutyl ketone	112a4are.dsF	0.202	-0.28	237.74
Methyl isobutyl ketone	112a4arf.dsF	0.203	-0.03	115.70
Tetrachloroethylene	151a4asa.dsF	4.574	4.42	3.30
Tetrachloroethylene	151a4asb.dsF	4.574	4.70	2.75
Tetrachloroethylene	151a4asd.dsF	1.013	0.98	3.70
Tetrachloroethylene	151a4ase.dsF	0.203	0.97	374.82
Tetrachloroethylene	151a4ASF.dsF	0.203	0.20	3.72
SF6	SF6_002	0.057	0.06	0.00

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
867.22	870.27	1253.68	1254.88	899.2	925.2

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TABLE 6-6 (con't)

Condenser Analysis File for
Toluene

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1ast	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Nitric oxide	NO2zap	10.1	10.10	0.00
Ethylene dibromide	080a4ara.ds ^f	5.031	4.88	3.00
Ethylene dibromide	080a4arb.ds ^f	5.031	5.15	2.39
Ethylene dibromide	080a4arc.ds ^f	1.016	1.13	11.18
Ethylene dibromide	080a4ard.ds ^f	1.017	1.06	4.06
Ethylene dibromide	080a4are.ds ^f	0.203	0.23	14.61
Ethylene dibromide	080a4arf.ds ^f	0.202	0.16	19.53
Methyl ethyl ketone	109a4ara.ds ^f	5.062	5.02	0.75
Methyl ethyl ketone	109a4arb.ds ^f	5.062	5.14	1.44
Methyl ethyl ketone	109a4arc.ds ^f	1.011	0.90	11.42
Methyl ethyl ketone	109a4ard.ds ^f	1.017	0.97	5.14
Methyl ethyl ketone	109a4are.ds ^f	0.203	0.19	5.84
Methyl ethyl ketone	109a4arf.ds ^f	0.202	0.18	12.32
Toluene	153a4ara.ds ^f	5.072	5.01	1.29
Toluene	153a4arb.ds ^f	5.072	5.14	1.39
Toluene	153a4arc.ds ^f	1.013	1.00	1.08
Toluene	153a4ard.ds ^f	1.009	1.00	1.43
Vinylidene chloride	169b4asa.ds ^f	3.039	1.92	36.76
Vinylidene chloride	169b4asb.ds ^f	3.039	2.21	27.34
Vinylidene chloride	169b4asc.ds ^f	0.604	9.69	1504.79
Vinylidene chloride	169b4ase.ds ^f	0.121	2.06	1610.18
Vinylidene chloride	169b4ASF.ds ^f	0.121	1.80	1396.07

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions
2791.18	2795.12	3155.95	3159.08	2862 2924
2791.18	2795.12	3155.95	3159.08	3018.19 3054.7

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TABLE 6-6 (con't)

Condenser Analysis File for
1,1,2-Trichloroethane

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Carbon monoxide	197asm	376.1	376.10	0.00
SF6	SF6_002	0.057	0.06	0.00
Acrolein	006b4anb.ds ^f	3.017	2.98	1.22
Acrolein	006b4ane.ds ^f	0.604	0.70	15.35
Acrolein	006b4anf.ds ^f	0.603	0.70	15.62
Acrolein	006b4anh.ds ^f	0.121	0.11	9.08
Carbonyl sulfide	030a4asc.ds ^f	1.012	0.91	9.73
Carbonyl sulfide	030a4asd.ds ^f	1.017	0.96	5.83
Carbonyl sulfide	030a4ase.ds ^f	0.203	0.61	199.13
Carbonyl sulfide	030a4ASF.ds ^f	0.203	0.59	188.14
Nitric oxide	NO2zap	10.1	10.10	0.00
Chlorobenzene	037a4ard.ds ^f	4.828	4.22	12.67
Chlorobenzene	037a4arf.ds ^f	1.033	2.59	150.73
Chlorobenzene	037a4arh.ds ^f	1.02	2.12	107.86
Chlorobenzene	037a4arj.ds ^f	0.203	1.30	537.76
1,1,2-Trichloroethane	159b4asa.ds ^f	3.033	3.03	0.19
1,1,2-Trichloroethane	159b4asb.ds ^f	3.033	3.04	0.34
1,1,2-Trichloroethane	159b4asc.ds ^f	0.602	0.59	1.58
1,1,2-Trichloroethane	159b4asd.ds ^f	0.604	0.59	1.55
1,1,2-Trichloroethane	159b4ase.ds ^f	0.12	0.11	7.30
1,1,2-Trichloroethane	159b4ASF.ds ^f	0.121	0.11	8.74
Vinyl chloride	168a4asa.ds ^f	5.092	7.36	44.54
Vinyl chloride	168a4asb.ds ^f	5.092	1.47	71.12
Vinyl chloride	168a4asc.ds ^f	1.013	7.35	625.51
Vinyl chloride	168a4asd.ds ^f	1.023	1.47	43.46
Vinyl chloride	168a4ASE.ds ^f	0.203	0.28	38.60

Analytical Regions (wavenumbers)

Baseline				Analytical Region	
Lower		Upper			
832.5	834	1252	1253.4	909.41	960
832.5	834	1252	1253.4	1181.99	1311

07/09

TABLE 6-6 (con't)

Condenser Analysis File for
Trichloroethylene

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1ast	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
1,3-Butadiene	023a4asa.ds1	5.092	5.12	0.49
1,3-Butadiene	023a4asb.ds1	5.092	5.07	0.51
1,3-Butadiene	023a4asc.ds1	1.006	1.01	0.75
1,3-Butadiene	023a4asd.ds1	1.023	1.01	0.82
1,3-Butadiene	023a4ase.ds1	0.205	0.22	6.48
1,3-Butadiene	023a4ast.ds1	0.203	0.22	8.68
Propylene dichloride	142b4asa.ds1	3.045	3.00	1.44
Propylene dichloride	142b4asb.ds1	3.045	3.10	1.68
Propylene dichloride	142b4asc.ds1	0.598	0.61	2.61
Propylene dichloride	142b4asd.ds1	0.601	0.55	9.08
Propylene dichloride	142b4ase.ds1	0.121	0.17	41.44
Propylene dichloride	142b4ast.ds1	0.121	0.07	38.56
Styrene	147a4asb.ds1	5.082	5.05	0.68
Styrene	147a4asc.ds1	1.015	1.15	12.77
Styrene	147a4asd.ds1	1.014	1.06	4.00
Styrene	147a4ase.ds1	0.202	0.20	1.08
Styrene	147a4ast.ds1	0.203	0.22	7.06
Trichloroethylene	160a4asa.ds1	5.102	5.08	0.54
Trichloroethylene	160a4asb.ds1	5.102	5.16	1.09
Trichloroethylene	160a4asc.ds1	1.014	0.91	10.52
Trichloroethylene	160a4asd.ds1	1.016	0.99	2.82
Trichloroethylene	160a4ase.ds1	0.203	0.19	5.72
Trichloroethylene	160a4ast.ds1	0.203	0.19	6.83
SF6	SF6_002	0.057	0.06	0.00

Analytical Regions (wavenumbers)				Analytical Regions	
Baseline					
Lower		Upper			
821.43	823.39	867.02	869.51	826.25	860.91
867.02	869.51	1978.25	1979.58	919.7	959.88

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TABLE 6-6 (con't)

**Condenser Analysis File for
2,2,4-Trimethylpentane**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1ASF	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Bromoform	022b4asc.dsF	0.605	0.44	27.68
Bromoform	022b4asd.dsF	0.604	0.68	12.46
Bromoform	022b4ase.dsF	0.121	0.31	159.06
Bromoform	022b4ASF.dsF	0.121	0.39	224.38
Carbon tetrachloride	029a4asc.dsF	1.015	0.80	21.49
Carbon tetrachloride	029a4asd.dsF	1.016	0.95	6.87
Carbon tetrachloride	029a4ase.dsF	0.203	0.83	309.37
Carbon tetrachloride	029a4ASF.dsF	0.203	0.86	323.13
Carbon tetrachloride	029a4ASG.dsF	0.051	0.23	348.55
Carbon tetrachloride	029a4ASH.dsF	0.052	0.48	826.62
Carbon disulfide	028a4ASA.dsF	5.092	4.71	7.54
Carbon disulfide	028a4ASB.dsF	5.092	4.17	18.19
Carbon disulfide	028a4ASC.dsF	1.018	4.20	312.73
Carbon disulfide	028a4ASD.dsF	1.014	3.88	282.56
Carbon disulfide	028a4ASG.dsF	0.204	2.75	1247.46
2,2,4-Trimethylpentane	165a4asc.dsF	1.015	1.02	0.41
2,2,4-Trimethylpentane	165a4asd.dsF	1.015	1.01	0.24
2,2,4-Trimethylpentane	165a4ase.dsF	0.202	0.20	1.82
2,2,4-Trimethylpentane	165a4ASF.dsF	0.203	0.20	2.46
m-Xylenes	172a4are.dsF	0.203	0.21	2.57
m-Xylenes	172a4arf.dsF	0.201	0.17	13.37
m-Xylenes	172a4arg.dsF	4.93	4.82	2.19
m-Xylenes	172a4arh.dsF	4.93	5.04	2.20
m-Xylenes	172a4ari.dsF	1.015	1.02	0.21
Nitric oxide	NO2zap	100	100.00	0.00

Analytical Regions (wavenumbers)

Baseline

Lower	Upper	Analytical Regions
2694.38	2696.18	3160.3 3161.01 2861.57 3009.2 07/09/9.

TABLE 6-6 (con't)

Condenser Analysis File for
Vinylidene chloride

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Ethylenedibromide	080a4ara.ds ^f	5.031	4.87	3.12
Ethylenedibromide	080a4arb.ds ^f	5.031	5.16	2.53
Ethylenedibromide	080a4arc.ds ^f	1.016	1.11	9.52
Ethylenedibromide	080a4ard.ds ^f	1.017	1.05	2.81
Ethylenedibromide	080a4are.ds ^f	0.203	0.28	37.27
Ethylenedibromide	080a4arf.ds ^f	0.202	0.24	18.52
Methyl ethyl ketone	109a4ara.ds ^f	5.062	5.02	0.90
Methyl ethyl ketone	109a4arb.ds ^f	5.062	5.13	1.31
Methyl ethyl ketone	109a4arc.ds ^f	1.011	0.88	12.87
Methyl ethyl ketone	109a4ard.ds ^f	1.017	1.03	1.22
Methyl ethyl ketone	109a4are.ds ^f	0.203	0.21	1.52
Methyl ethyl ketone	109a4arf.ds ^f	0.202	0.26	30.30
Toluene	153a4ara.ds ^f	5.072	4.96	2.27
Toluene	153a4arb.ds ^f	5.072	5.18	2.21
Toluene	153a4arc.ds ^f	1.013	0.98	3.48
Toluene	153a4ard.ds ^f	1.009	1.06	4.98
Vinylidene chloride	169b4asa.ds ^f	3.039	3.02	0.57
Vinylidene chloride	169b4asb.ds ^f	3.039	3.05	0.34
Vinylidene chloride	169b4asc.ds ^f	0.604	0.64	5.65
Vinylidene chloride	169b4ase.ds ^f	0.121	0.13	3.62
Vinylidene chloride	169b4ASF.ds ^f	0.121	0.13	3.62

Analytical Regions (wavenumbers)					
Baseline					
Lower		Upper		Analytical Regions	
831.81	832.41	1004.05	1004.59	834.13	898.73
1004.05	1004.59	1251.17	1255.11	1059.44	1113.01

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TABLE 6-6 (con't)

**Condenser Analysis File for
o-Xylenes**

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.00	0.00
Sulfur dioxide	198c1ASF	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.00
Acrylonitrile	009a4ara.dsF	4.991	4.68	6.18
Acrylonitrile	009a4arb.dsF	4.991	4.92	1.51
Acrylonitrile	009a4arc.dsF	1.006	2.09	107.56
Acrylonitrile	009a4ard.dsF	1.014	1.63	60.48
Acrylonitrile	009a4are.dsF	0.203	0.69	237.26
Acrylonitrile	009a4arf.dsF	0.2	0.74	267.06
Allyl Chloride	010b4asa.dsF	3.093	3.13	1.30
Allyl Chloride	010b4asb.dsF	3.093	3.09	0.27
Allyl Chloride	010b4asc.dsF	0.601	0.54	9.90
Allyl Chloride	010b4asd.dsF	0.602	0.50	17.35
Ethyl benzene	077a4ara.dsF	5.113	4.95	3.25
Ethyl benzene	077a4arb.dsF	5.113	5.25	2.63
Ethyl benzene	077a4arc.dsF	1.014	1.13	11.28
Ethyl benzene	077a4ard.dsF	1.017	1.06	3.79
Ethyl benzene	077a4arf.dsF	0.203	0.24	18.46
o-Xylenes	171a4asa.dsF	5.072	5.00	1.50
o-Xylenes	171a4asb.dsF	5.072	5.10	0.55
o-Xylenes	171a4asc.dsF	1.015	1.06	3.96
o-Xylenes	171a4asd.dsF	1.016	1.14	11.99
o-Xylenes	171a4ase.dsF	0.203	0.39	93.64
o-Xylenes	171a4ASF	0.203	0.40	98.74
Nitric oxide	NO2zap	10.1	10.10	0.00

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
2805.09	2809.42	3160.09	3161.22	2859.84	3095.0

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Condenser Analysis File for
p-Xylenes

TABLE 6-6 (con't)

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	1000	1000.08	0.01
Sulfur dioxide	198c1asf	25.791	25.79	0.00
Carbon dioxide	CO2a	11	11.00	0.04
Hexane	095a4asa.ds ^f	5.092	5.11	0.34
Hexane	095a4asc.ds ^f	1.021	0.94	7.99
Hexane	095a4ase.ds ^f	0.206	0.19	7.23
Methylene chloride	117a4asa.ds ^f	5.082	5.09	0.06
Methylene chloride	117a4asc.ds ^f	1.015	1.01	0.40
Methylene chloride	117a4ase.ds ^f	0.202	0.18	9.17
Propylene oxide	143b4ana.ds ^f	15.065	14.93	0.90
Propylene oxide	143b4anc.ds ^f	3.006	3.69	22.70
Vinyl acetate	166a4asa.ds ^f	5.082	5.09	0.10
Vinyl acetate	166a4asc.ds ^f	1.013	0.99	2.12
Vinyl acetate	166a4ase.ds ^f	0.203	0.18	9.50
p-Xylenes	173a4asa.ds ^f	5.102	4.98	2.42
p-Xylenes	173a4asb.ds ^f	5.102	5.26	3.01
p-Xylenes	173a4asc.ds ^f	1.007	0.93	7.30
p-Xylenes	173a4asd.ds ^f	1.018	0.94	7.28
p-Xylenes	173a4ase.ds ^f	0.204	0.19	7.79
Nitric oxide	NO2zap	10.1	10.10	0.00

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
2559.43	2560.94	3159.88	3160.98	2854.43	3083.14
1978.64	0	1979.58	0	770.61	819.06
1978.64	0	1979.58	0	1082.58	1141.27

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Concentrated Analysis File for
Benzene

TABLE 6-6 (con't)

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1bvb	385	485.39	26.07
Water	194c1ana	1000	953.17	4.68
Water	194c1anb	220	257.15	16.89
Contaminant 1	contam1	100	100.04	0.04
Contaminant 3	contam3	100	99.94	0.06
Contaminant 6	contam6	100	100.00	0.00
Benzene	015a4arc.ds ^f	1.036	1.03	0.49
Benzene	015a4ard.ds ^f	1.016	1.00	1.54
Benzene	015a4are.ds ^f	0.205	0.26	25.33
Benzene	015a4arf.ds ^f	0.203	0.26	25.75
Methyl isobutyl ketone	112a4ara.ds ^f	5.031	4.18	16.84
Methyl isobutyl ketone	112a4arb.ds ^f	5.031	4.25	15.47
Methyl isobutyl ketone	112a4arc.ds ^f	1.014	4.09	302.66
Methyl isobutyl ketone	112a4ard.ds ^f	1.012	3.96	290.63
Methyl isobutyl ketone	112a4are.ds ^f	0.202	4.54	2143.29
Methyl isobutyl ketone	112a4arf.ds ^f	0.203	5.93	2816.99
Tetrachloroethylene	151a4asa.ds ^f	4.574	5.28	15.38
Tetrachloroethylene	151a4asb.ds ^f	4.574	3.59	21.57
Tetrachloroethylene	151a4asd.ds ^f	1.013	1.82	79.62
Tetrachloroethylene	151a4ase.ds ^f	1.013	1.22	20.29
Tetrachloroethylene	151a4ast.ds ^f	0.203	1.61	691.72

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
495.99	498.46	2396.25	2400.58	672.09	700.0

07/09/

Concentrated Analysis File for
Chlorobenzene

TABLE 6-6 (con't)

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1bvb	1000	1000.00	0.00
Contaminant 1	contam1	100	100.00	0.00
Contaminant 6	contam6	100	100.00	0.00
Chlorobenzene	037a4arc.dsf	4.828	5.04	4.39
Chlorobenzene	037a4ard.dsf	4.828	4.61	4.56
Chlorobenzene	037a4arf.dsf	1.033	1.09	5.64
Chlorobenzene	037a4arh.dsf	1.033	1.01	2.50
Chlorobenzene	037a4arj.dsf	0.203	0.23	13.02
1,1,2-Trichloroethane	159b4asa.dsf	3.033	3.03	0.01
1,1,2-Trichloroethane	159b4asb.dsf	3.033	3.05	0.45
1,1,2-Trichloroethane	159b4asc.dsf	0.602	0.57	4.96
1,1,2-Trichloroethane	159b4asd.dsf	0.604	0.57	5.26
1,1,2-Trichloroethane	159b4ast.dsf	0.121	0.08	35.06

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower		Upper			
495	497	2397	2400	684.2	686.57
495	497	2397	2400	730.68	751.16
495	497	2397	2400	1024.73	1026.5

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Concentrated Analysis File for
Ethylene dibromide

TABLE 6-6 (con't)

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ANA	1000	1000.00	0.00
Contaminant 3	contam3	100	100.00	0.00
Contaminant 6	contam6	100	100.00	0.00
Ethylene dibromide	080a4ara.ds ^f	5.031	4.86	3.38
Ethylene dibromide	080a4arb.ds ^f	5.031	5.18	2.90
Ethylene dibromide	080a4arc.ds ^f	1.016	1.14	12.33
Ethylene dibromide	080a4ard.ds ^f	1.017	1.01	0.31
Ethylene dibromide	080a4are.ds ^f	0.203	0.20	0.33
Ethylene dibromide	080a4arf.ds ^f	0.202	0.19	4.71
Methyl chloroform	108a4asa.ds ^f	5.123	5.21	1.76
Methyl chloroform	108a4asb.ds ^f	5.123	5.10	0.53
Methyl chloroform	108a4asc.ds ^f	1.01	1.45	43.45
Methyl chloroform	108a4asd.ds ^f	1.012	0.46	54.55
Methyl chloroform	108a4ase.ds ^f	0.203	-0.29	244.67
Methyl chloroform	108a4ASF.ds ^f	0.203	-0.32	257.15
2-Nitropropane	124b4ana.ds ^f	3.013	3.02	0.18
2-Nitropropane	124b4anb.ds ^f	3.016	2.70	10.60
2-Nitropropane	124b4anc.ds ^f	0.604	0.91	49.92
2-Nitropropane	124b4and.ds ^f	0.603	1.72	185.58
2-Nitropropane	124b4ane.ds ^f	0.121	0.46	280.93
2-Nitropropane	124b4anf.ds ^f	0.124	0.53	326.58

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
495.99	498.46	2396.25	2400.58	594.25	609.21
495.99	498.46	2396.25	2400.58	1182	1191.1

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Concentrated Analysis File for
Hexane

TABLE 6-6 (con't)

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	535	535.94	0.18
Water	194c1ana	1000	999.50	0.05
Hydrogen chloride	hcl_2e	166	166.00	0.00
Contaminant 1	contam1	200	200.00	0.00
Contaminant 3	contam3	100	100.00	0.00
Contaminant 6	contam6	100	100.01	0.01
Hexane	095a4asa.ds ^f	5.092	5.10	0.08
Hexane	095a4asb.ds ^f	5.092	5.11	0.42
Hexane	095a4asc.ds ^f	1.021	0.92	10.21
Hexane	095a4asd.ds ^f	1.02	1.01	1.41
Hexane	095a4ase.ds ^f	0.206	0.18	12.14
Hexane	095a4ASF.ds ^f	0.203	0.19	5.82
Vinyl acetate	166a4asa.ds ^f	5.082	4.90	3.57
Vinyl acetate	166a4asb.ds ^f	5.082	4.86	4.29
Vinyl acetate	166a4asc.ds ^f	1.013	1.80	77.08
Vinyl acetate	166a4asd.ds ^f	1.017	1.91	87.22
Vinyl acetate	166a4ase.ds ^f	0.203	0.86	325.01
Vinyl acetate	166a4ASF.ds ^f	0.203	1.18	482.24
p-Xylenes	173a4asa.ds ^f	5.102	4.96	2.75
p-Xylenes	173a4asb.ds ^f	5.102	5.25	2.93
p-Xylenes	173a4asc.ds ^f	1.007	0.93	8.21
p-Xylenes	173a4asd.ds ^f	1.018	1.03	1.31
p-Xylenes	173a4ASE.ds ^f	0.204	0.31	51.17

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Regions	
2498.9	2504.5	3154.77	3161.02	2835	2910

07/09/93

TABLE 6-6 (con't)

Concentrated Analysis File for
Methyl ethyl ketone

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1bvb	405	403.84	0.29
Water	194c1ana	1000	1000.23	0.02
Water	194c1anb	235	236.03	0.44
Contaminant 1	contam1	100	100.00	0.00
Contaminant 2	contam2	100	100.00	0.00
Contaminant 3	contam3	100	100.00	0.00
Contaminant 6	contam6	100	100.00	0.00
Hydrogen chloride	hcl_2e	200	200.00	0.00
Ethylene dibromide	080a4ara.ds ^f	5.031	4.86	3.39
Ethylene dibromide	080a4arb.ds ^f	5.031	5.18	2.94
Ethylene dibromide	080a4arc.ds ^f	1.016	1.14	12.12
Ethylene dibromide	080a4ard.ds ^f	1.017	1.01	0.82
Ethylene dibromide	080a4are.ds ^f	0.203	0.20	0.42
Ethylene dibromide	080a4arf.ds ^f	0.202	0.20	3.11
Methyl ethyl ketone	109a4ara.ds ^f	5.062	5.01	0.97
Methyl ethyl ketone	109a4arb.ds ^f	5.062	5.12	1.14
Methyl ethyl ketone	109a4arc.ds ^f	1.011	0.95	5.88
Methyl ethyl ketone	109a4ard.ds ^f	1.017	1.02	0.32
Methyl ethyl ketone	109a4are.ds ^f	0.203	0.25	20.60
Methyl ethyl ketone	109a4arf.ds ^f	0.202	0.23	12.09
Toluene	153a4ara.ds ^f	5.072	5.05	0.50
Toluene	153a4arb.ds ^f	5.072	5.17	1.96
Toluene	153a4arc.ds ^f	1.013	0.83	18.07
Toluene	153a4ard.ds ^f	1.009	0.82	18.76
Vinylidene chloride	169b4asa.ds ^f	3.039	3.24	6.76
Vinylidene chloride	169b4asb.ds ^f	3.039	3.18	4.62
Vinylidene chloride	169b4asc.ds ^f	0.604	-0.37	161.39
Vinylidene chloride	169b4ase.ds ^f	0.604	-0.12	120.46
Vinylidene chloride	169b4ASF.ds ^f	0.121	-0.08	168.02

Analytical Regions (wavenumbers)

Baseline

Lower		Upper		Analytical Region	
2575	2601.79	3319.76	3322.13	2895.14	3021
495	498	2400	2404	1135.36	1215

07/09,

Concentrated Analysis File for
2-Nitropropane

TABLE 6-6 (con't)

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	218	232.45	6.63
Water	194c1bvb	467	424.15	9.18
Water	194c1ana	1000	1016.86	1.69
Ethylene dibromide	080a4ara.ds ^f	5.031	4.94	1.79
Ethylene dibromide	080a4arb.ds ^f	5.031	4.65	7.68
Ethylene dibromide	080a4arc.ds ^f	1.016	2.23	118.90
Ethylene dibromide	080a4ard.ds ^f	1.017	1.95	91.64
Ethylene dibromide	080a4are.ds ^f	0.203	0.85	319.66
Ethylene dibromide	080a4arf.ds ^f	0.202	0.64	217.68
Methyl chloroform	108a4asa.ds ^f	5.123	5.34	4.14
Methyl chloroform	108a4asb.ds ^f	5.123	4.17	18.55
Methyl chloroform	108a4asc.ds ^f	1.01	2.81	178.12
Methyl chloroform	108a4asd.ds ^f	1.012	2.22	118.81
Methyl chloroform	108a4ase.ds ^f	0.203	2.18	971.27
Methyl chloroform	108a4ASF.ds ^f	0.203	1.90	836.49
2-Nitropropane	124b4ana.ds ^f	3.013	2.97	1.42
2-Nitropropane	124b4anb.ds ^f	3.016	3.07	1.78
2-Nitropropane	124b4anc.ds ^f	0.604	0.57	4.93
2-Nitropropane	124b4and.ds ^f	0.603	0.58	4.17
2-Nitropropane	124b4ane.ds ^f	0.121	0.13	8.21
2-Nitropropane	124b4anf.ds ^f	0.124	0.11	8.20

Analytical Regions (wavenumbers)

Baseline

Lower	Upper	Analysical Regions
1300.13	1302.69	2404.03 2415.06

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Concentrated Analysis File for
Tetrachloroethylene

TABLE 6-6 (con't)

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1bvb	475	477.09	0.44
Water	194c1ana	1000	999.00	0.10
Contaminant 1	contam1	100	100.00	0.00
Contaminant 6	contam6	100	100.00	0.00
Benzene	015a4ara.ds ^f	5.052	4.96	1.87
Benzene	015a4arb.ds ^f	5.052	4.94	2.14
Benzene	015a4arc.ds ^f	1.036	2.02	95.07
Benzene	015a4ard.ds ^f	1.016	1.02	0.52
Methyl isobutyl ketone	112a4ara.ds ^f	5.031	4.94	1.83
Methyl isobutyl ketone	112a4arb.ds ^f	5.031	5.10	1.35
Methyl isobutyl ketone	112a4arc.ds ^f	1.014	1.12	10.77
Methyl isobutyl ketone	112a4ard.ds ^f	1.012	1.11	9.15
Methyl isobutyl ketone	112a4are.ds ^f	0.202	0.05	74.61
Methyl isobutyl ketone	112a4arf.ds ^f	0.203	-0.06	129.49
Tetrachloroethylene	151a4asa.ds ^f	4.574	4.44	2.91
Tetrachloroethylene	151a4asb.ds ^f	4.574	4.72	3.21
Tetrachloroethylene	151a4asd.ds ^f	1.013	0.99	2.44
Tetrachloroethylene	151a4ase.ds ^f	1.013	0.98	3.53
Tetrachloroethylene	151a4ASF.ds ^f	0.203	0.20	2.98

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower		Upper			
495.99	498.46	2396.25	2400.38	762.4	80
495.99	498.46	2396.25	2400.38	885	94

07/09/9

TABLE 6-6 (con't)

Concentrated Analysis File for
Toluene

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1anb	415	414.09	0.22
Water	194c1bvb	1000	1000.37	0.04
Contaminant 6	contam6	100	100.00	0.00
Ethylene dibromide	080a4ara.ds ^f	5.031	5.46	8.50
Ethylene dibromide	080a4arb.ds ^f	5.031	3.68	26.81
Ethylene dibromide	080a4arc.ds ^f	1.016	3.10	205.12
Ethylene dibromide	080a4ard.ds ^f	1.017	2.72	167.36
Ethylene dibromide	080a4are.ds ^f	0.203	1.97	869.74
Ethylene dibromide	080a4arf.ds ^f	0.202	2.29	1031.95
Methyl ethyl ketone	109a4ara.ds ^f	5.062	5.47	8.01
Methyl ethyl ketone	109a4arb.ds ^f	5.062	5.51	8.92
Methyl ethyl ketone	109a4arc.ds ^f	1.011	-0.81	180.09
Methyl ethyl ketone	109a4ard.ds ^f	1.017	-0.85	183.65
Methyl ethyl ketone	109a4are.ds ^f	0.203	-1.41	792.82
Methyl ethyl ketone	109a4arf.ds ^f	0.202	-1.12	652.04
Toluene	153a4ara.ds ^f	5.072	4.98	1.91
Toluene	153a4arb.ds ^f	5.072	5.13	1.06
Toluene	153a4arc.ds ^f	1.013	1.12	10.72
Toluene	153a4ard.ds ^f	1.009	1.12	10.59
Vinylidene chloride	169b4asa.ds ^f	3.039	1.79	41.22
Vinylidene chloride	169b4asb.ds ^f	3.039	2.45	19.55
Vinylidene chloride	169b4asc.ds ^f	0.604	8.20	1259.17
Vinylidene chloride	169b4ase.ds ^f	0.604	1.98	228.67
Vinylidene chloride	169b4ASF.ds ^f	0.121	1.72	1329.54

Analytical Regions (wavenumbers)

Baseline				Analytical Regions	
Lower		Upper		692.82	695.58
496.63	497.67	2410.43	2419.09	720	732.21
496.63	497.68	2410.43	2419.09		

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Concentrated Analysis File for
Trichloroethylene

TABLE 6-6 (con't)

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	1000.00	0.00
Contaminant 1	CONTAM1	100	100.00	0.00
Contaminant 6	CONTAM6	100	100.00	0.00
Propylene dichloride	142b4asa.ds1	3.045	2.88	5.50
Propylene dichloride	142b4asb.ds1	3.045	3.10	1.75
Propylene dichloride	142b4asc.ds1	0.598	0.77	27.93
Propylene dichloride	142b4asd.ds1	0.601	0.86	42.89
Propylene dichloride	142b4ase.ds1	0.121	0.52	326.71
Propylene dichloride	142b4ASF.ds1	0.121	0.49	308.46
Styrene	147a4asb.ds1	5.082	5.08	0.08
Styrene	147a4asc.ds1	1.015	1.09	7.71
Styrene	147a4asd.ds1	1.014	0.98	3.41
Styrene	147a4ase.ds1	0.202	0.15	23.77
Styrene	147a4ASF.ds1	0.203	0.14	31.83
Trichloroethylene	160a4asa.ds1	5.102	5.07	0.66
Trichloroethylene	160a4asb.ds1	5.102	5.15	0.86
Trichloroethylene	160a4asc.ds1	1.014	0.95	6.45
Trichloroethylene	160a4asd.ds1	1.016	1.02	0.76
Trichloroethylene	160a4ase.ds1	0.203	0.22	9.63
Trichloroethylene	160a4ASF.ds1	0.203	0.22	7.07

Analytical Regions (wavenumbers)

Baseline

Lower	Upper	Analytical Regions
495.99	498.46	781.52 784.3
495.99	498.46	931 948
495.99	498.46	837 857

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TABLE 6-6 (con't)

Concentrated Analysis File for
m-Xylenes

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1ana	1000	999.63	0.04
Water	194c1anb	170	172.22	1.30
Contaminant 6	contam6	100	99.98	0.02
Bromoform	022b4asc.dsf	0.605	0.64	6.43
Bromoform	022b4asd.dsf	0.604	0.47	22.40
Bromoform	022b4ase.dsf	0.121	0.24	101.05
Bromoform	022b4ASF.dsf	0.121	0.48	297.96
Carbon tetrachloride	029a4asc.dsf	1.015	1.01	0.73
Carbon tetrachloride	029a4asd.dsf	1.016	1.03	0.93
Carbon tetrachloride	029a4ase.dsf	0.203	0.20	1.24
Carbon tetrachloride	029a4ASF.dsf	0.203	0.20	1.15
Carbon tetrachloride	029a4ASG.dsf	0.051	0.04	24.71
Carbon tetrachloride	029a4ASH.dsf	0.052	0.04	20.61
2,2,4-Trimethylpentane	165a4asa.dsf	5.102	4.22	17.26
2,2,4-Trimethylpentane	165a4asb.dsf	5.102	3.87	24.22
2,2,4-Trimethylpentane	165a4asc.dsf	1.015	5.95	485.74
2,2,4-Trimethylpentane	165a4asd.dsf	1.015	4.48	340.89
2,2,4-Trimethylpentane	165a4ase.dsf	0.202	5.48	2608.79
2,2,4-Trimethylpentane	165a4ASF.dsf	0.203	6.15	2922.72
m-Xylenes	172a4are.dsf	0.203	0.22	6.71
m-Xylenes	172a4arf.dsf	0.201	0.19	8.34
m-Xylenes	172a4arg.dsf	4.93	4.82	2.29
m-Xylenes	172a4arh.dsf	4.93	5.04	2.21
m-Xylenes	172a4ari.dsf	1.015	1.04	1.98

Analytical Regions (wavenumbers)

Baseline

Lower	Upper	Analytical Regions
495.99	498.46	765.2 770.7
2396.25	2400.58	

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Concentrated Analysis File for
p-Xylenes

TABLE 6-6 (con't)

Compound Name	File Name	ASC	ISC	% Difference
Water	194c1bvb	545	528.33	3.06
Water	194c1anb	230	218.52	4.99
Water	194c1ana	1000	1011.73	1.17
Contaminant 1	contam1	200	200.04	0.02
Contaminant 3	contam3	100	99.98	0.02
Contaminant 6	contam6	100	100.00	0.00
Hexane	095a4asa.ds1	5.092	3.87	24.05
Hexane	095a4asb.ds1	5.092	5.06	0.66
Hexane	095a4asc.ds1	1.021	3.90	282.09
Hexane	095a4asd.ds1	1.02	3.09	203.24
Hexane	095a4ase.ds1	0.206	3.33	1511.68
Hexane	095a4asf.ds1	0.203	3.74	1740.10
Vinyl acetate	166a4asc.ds1	1.013	0.85	16.40
Vinyl acetate	166a4asd.ds1	1.017	0.93	8.32
Vinyl acetate	166a4ase.ds1	0.203	0.82	304.64
Vinyl acetate	166a4asf.ds1	0.203	0.84	311.58
p-Xylenes	173a4asa.ds1	5.102	4.98	2.34
p-Xylenes	173a4asb.ds1	5.102	5.25	2.90
p-Xylenes	173a4asc.ds1	- 1.007	0.91	9.31
p-Xylenes	173a4asd.ds1	1.018	0.97	4.50
p-Xylenes	173a4ase.ds1	0.204	0.19	9.12

Analytical Regions (wavenumbers)

Baseline

Lower	Upper	Analytical Regions
495	2400	788 809

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TABLE 6-7. Compounds Not Meeting Method 301 Criteria in Hot/Wet Samples.

TABLE 6-7 (continued)

Carbon Disulfide-028			
SPIKED	DEV.	UNSPIKED	DEV.
18.39	23.52	17.95	18.28
41.90		36.23	
58.83	4.41	16.59	28.99
63.23		45.58	
26.13	-8.47	41.22	-9.80
17.66		31.42	
61.36	-16.14	8.14	30.03
45.22		38.17	
19.94	34.81	47.29	-44.09
54.74		3.20	
40.74	38.12	28.58	23.41
RSD=	35.71	RSD=	70.99
Blas=	2.48	Exp Conc=	9.68
t=	0.10	CF=	0.80

Carbon Tetrachloride-029			
SPIKED	DEV.	UNSPIKED	DEV.
7.33	0.04	0.19	-0.01
7.37		0.18	
7.42	0.00	0.19	0.00
7.43		0.19	
7.47	0.05	0.25	-0.05
7.52		0.21	
7.50	-0.02	0.21	-0.02
7.47		0.18	
7.59	-0.06	0.26	-0.06
7.54		0.20	
7.46	0.01	0.21	-0.14
RSD=	0.37	RSD=	11.87
Blas=	-2.72	Exp Conc=	9.98
t=	74.24	CF=	1.37

TABLE 6-7 (continued)

Chloroform-039			
SPIKED	DEV.	UNSPIKED	DEV.
15.35	-0.19	0.80	-0.01
15.16		0.79	
15.33	-0.19	0.69	0.06
15.14		0.75	
15.24	0.05	0.91	-0.28
15.28		0.63	
15.22	-0.01	1.03	-0.44
15.21		0.58	
15.60	-0.09	0.64	0.13
15.51		0.78	
15.49	-0.29	0.79	-0.16
15.20		0.63	
15.31	-0.72	0.75	-0.70
RSD=	0.76	- RSD=	21.69
Bias=	4.90	Exp Conc=	9.66
t=	24.48	CF=	0.66

Cumene-046			
SPIKED	DEV.	UNSPIKED	DEV.
14.68	0.12	-0.59	-0.02
14.80		-0.61	
14.89	0.18	-0.57	-0.03
15.07		-0.60	
15.12	0.09	-0.59	0.03
15.20		-0.56	
15.36	0.22	-0.82	0.28
15.58		-0.54	
15.69	0.19	-0.27	-0.16
15.88		-0.44	
15.81	0.10	-0.45	0.01
15.91		-0.44	
15.33	0.89	-0.54	0.11
RSD=	0.72	- RSD=	-17.61
Bias=	5.85	Exp Conc=	10.02
t=	40.11	CF=	0.63

TABLE 6-7 (continued)

1,2-Epoxy Butane-075			
SPIKED	DEV.	UNSPIKED	DEV.
13.17	0.41	-0.41	0.40
13.58		-0.01	
14.09	-0.28	-0.46	0.32
13.81		-0.14	
11.26	0.44	1.00	-0.74
11.70		0.26	
11.72	-0.10	0.56	-1.11
11.61		-0.55	
9.79	0.98	0.27	-0.46
10.76		-0.19	
10.59	0.01	-0.49	-0.32
10.60		-0.81	
11.89	1.44	-0.08	-1.91
RSD=	2.87	RSD=	-540.44
Bias=	1.31	Exp Conc=	10.66
t=	2.35	CF=	0.89

Ethyl Benzene-077			
SPIKED	DEV.	UNSPIKED	DEV.
14.38	0.06	-0.44	-0.58
14.45		-1.02	
14.45	-0.32	-1.11	-0.03
14.13		-1.14	
14.42	0.08	-0.68	-0.54
14.50		-1.22	
14.41	0.13	-1.09	-0.10
14.54		-1.18	
14.38	0.04	-0.85	-0.35
14.42		-1.20	
14.49	0.31	-1.27	0.11
14.80		-1.16	
14.45	0.30	-1.03	-1.48
RSD=	0.95	RSD=	-24.58
Bias=	5.48	Exp Conc=	10.00
t=	19.02	CF=	0.65

TABLE 6-7 (continued)

Ethylene Oxide-084			
SPIKED	DEV.	UNSPIKED	DEV.
3.45	-0.74	-0.44	-0.72
2.71		-1.16	
2.13	0.07	-0.93	0.41
2.19		-0.52	
3.57	-0.22	-1.66	0.33
3.35		-1.33	
3.41	-0.22	-1.90	1.20
3.20		-0.70	
3.52	-0.80	-1.07	-0.14
2.72		-1.22	
3.34	-0.27	-0.61	-0.19
3.07		-0.80	
3.06	-2.17	-1.03	0.88
RSD=	10.99	RSD=	-42.51
Bias=	-5.92	Exp Conc=	10.00
t=	10.73	CF=	2.45

Methanol-104			
SPIKED	DEV.	UNSPIKED	DEV.
11.68	0.47	-1.19	0.19
12.15		-1.01	
12.13	0.17	-1.16	-0.01
12.30		-1.17	
11.71	0.21	-0.92	-0.20
11.92		-1.12	
11.80	0.30	-1.19	-0.02
12.10		-1.21	
11.44	0.46	-1.27	0.09
11.90		-1.18	
11.81	-0.07	-1.06	-0.29
11.75		-1.35	
11.89	1.54	-1.15	-0.24
RSD=	1.88	RSD=	-10.13
Bias=	4.40	Exp Conc=	8.64
t=	17.47	CF=	0.66

TABLE 6-7 (continued)

Methyl Bromide-106			
SPIKED	DEV.	UNSPIKED	DEV.
12.55	0.73	-2.66	
13.28		-3.48	-0.82
14.45	-0.89	-3.03	
13.55		-2.33	0.70
14.50	0.03	-3.07	
14.54		-2.59	0.47
14.32	1.96	-2.51	
16.27		-1.68	0.83
13.64	-0.72	-1.79	
12.92		-1.65	0.14
11.76	-0.21	-3.18	
11.55		-3.31	-0.13
13.61	0.90	-2.61	1.20
RSD=	5.07	- RSD=	-16.11
Bias=	6.24	Exp Conc=	9.98
t=	7.72	CF=	0.62

Methyl Chloroform-108			
SPIKED	DEV.	UNSPIKED	DEV.
10.49	0.06	4.78	
10.55		4.42	-0.36
10.58	-0.26	4.44	
10.33		4.54	0.10
10.41	0.01	4.48	
10.42		4.55	0.07
10.46	-0.06	4.54	
10.40		4.54	0.01
10.33	0.02	4.53	
10.35		4.52	-0.01
10.22	0.05	4.46	
10.27		4.54	0.09
10.40	-0.18	4.53	-0.10
RSD=	0.77	RSD=	2.47
Bias=	-2.77	Exp Conc=	8.64
t=	20.10	CF=	1.47

TABLE 6-7 (continued)

Methyl Iodide-111			
SPIKED	DEV.	UNSPIKED	DEV.
8.02	-0.63	-1.28	0.62
7.39		-0.66	
6.85	-0.23	-0.63	0.63
6.62		0.00	
7.83	0.14	-0.57	0.49
7.97		-0.09	
7.88	-0.24	0.10	0.37
7.64		0.47	
7.87	-0.59	-0.50	0.07
7.28		-0.43	
6.91	-0.72	-0.31	0.04
6.20		-0.27	
7.37	-2.26	-0.35	2.21
RSD=	4.60	- RSD=	-89.10
Bias=	-2.32	Exp Conc=	10.04
t=	5.05	CF=	1.30

Methyl Isobutyl Ketone-112			
SPIKED	DEV.	UNSPIKED	DEV.
20.98	0.28	4.10	0.36
21.25		4.46	
21.31	-0.26	4.50	-0.09
21.05		4.42	
21.09	0.30	4.39	0.07
21.38		4.45	
21.21	-0.03	4.52	0.04
21.18		4.56	
20.93	0.29	4.35	0.13
21.22		4.48	
21.18	-0.08	4.60	-0.14
21.09		4.47	
21.16	0.50	4.44	0.37
RSD=	0.77	RSD=	2.74
Bias=	6.71	Exp Conc=	10.00
t=	32.89	CF=	0.60

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TABLE 6-7 (continued)

Methyl t-Butyl Ether-115			
SPIKED	DEV.	UNSPIKED	DEV.
-2.85	0.25	-0.68	
-2.60		-0.38	0.30
-2.27	0.19	-0.60	
-2.08		-0.39	0.21
-1.31	0.78	-0.60	
-0.52		-0.37	0.23
0.04	0.67	-0.49	
0.71		-0.34	0.15
1.43	0.70	-0.67	
2.13		-0.50	0.17
2.44	0.17	-0.44	
2.61		-0.43	0.01
-0.19	2.76	-0.49	1.07
RSD=	-196.95	- RSD=	-28.61
Bias=	-9.34	Exp Conc=	9.64
t=	23.41	CF=	31.90

Methylene Chloride-117			
SPIKED	DEV.	UNSPIKED	DEV.
9.60	0.82	0.65	
10.42		1.03	0.38
10.81	0.13	-0.47	
10.94		0.41	0.88
10.69	0.16	0.60	
10.85		0.18	-0.42
10.73	0.74	0.08	
11.47		0.29	0.21
10.37	0.00	0.31	
10.37		0.16	-0.15
10.61	0.40	0.19	
11.02		-0.19	-0.37
10.65	2.26	0.27	0.52
RSD=	3.23	RSD=	121.81
Bias=	0.36	Exp Conc=	10.02
t=	0.77	CF=	0.96

TABLE 6-7 (continued)

Propylene Oxide-143			
SPIKED	DEV.	UNSPIKED	DEV.
-1.11		-4.17	
-2.90	-1.80	-4.00	0.17
-2.58		-3.46	
-1.91	0.66	-3.39	0.07
-1.97		-4.29	
-4.04	-2.06	-3.60	0.69
-1.86		-3.48	
-3.68	-1.82	-4.17	-0.69
-2.63		-4.25	
-3.13	-0.50	-3.29	0.96
-1.98		-3.02	
-3.08	-1.10	-4.42	-1.40
-2.57	-6.62	-3.79	-0.20
RSD=	-40.01	RSD=	-14.94
Bias=	-8.82	Exp Conc=	10.04
t=	7.50	CF=	8.21

Styrene-147			
SPIKED	DEV.	UNSPIKED	DEV.
14.04		2.87	
13.80	-0.24	1.02	-1.85
13.84		1.34	
13.92	0.09	1.05	-0.29
14.10		1.25	
14.40	0.30	-0.43	-1.69
14.31		-0.12	
14.18	-0.13	0.00	0.12
13.65		0.60	
13.97	0.32	0.45	-0.15
14.23		0.67	
14.08	-0.15	0.67	0.00
14.04	0.18	0.78	-3.86
RSD=	1.11	RSD=	93.36
Bias=	2.50	Exp Conc=	10.76
t=	3.35	CF=	0.81

TABLE 6-7 (continued)

Tetrachloroethylene-151			
SPIKED	DEV.	UNSPIKED	DEV.
10.45	0.20	-0.09	-0.01
10.65		-0.10	
10.60	0.10	-0.10	-1.07
10.70		-1.17	
10.53	0.10	-0.01	-0.07
10.63		-0.08	
10.68	-0.08	-0.10	0.02
10.60		-0.09	
10.56	0.01	-0.06	0.00
10.57		-0.06	
10.62	-0.01	-0.11	0.00
10.62		-0.11	
10.60	0.32	-0.17	-1.14
RSD =	0.70	RSD =	-179.94
Bias =	0.77	Exp Conc =	10.00
t =	2.43	CF =	0.93

Toluene-153			
SPIKED	DEV.	UNSPIKED	DEV.
14.13	0.29	0.94	-0.43
14.41		0.51	
14.39	-0.08	0.23	0.08
14.31		0.31	
14.45	0.10	0.32	0.03
14.54		0.34	
14.59	-0.37	0.69	-0.55
14.22		0.13	
13.94	-0.21	0.13	0.22
13.73		0.35	
14.02	-0.16	0.07	-0.04
13.86		0.03	
14.22	-0.44	0.34	-0.70
RSD =	1.12	RSD =	63.78
Bias =	4.12	Exp Conc =	9.76
t =	15.42	CF =	0.70

TABLE 6-7 (continued)

o-Xylene-171			
SPIKED	DEV.	UNSPIKED	DEV.
14.17	-0.01	-3.36	0.25
14.16		-3.11	
14.06	0.24	-3.22	-0.10
14.31		-3.32	
14.09	0.05	-2.93	-0.11
14.14		-3.04	
14.22	-0.10	-3.18	0.15
14.12		-3.02	
14.11	0.33	-2.96	-0.09
14.43		-3.04	
14.32	0.11	-2.90	-0.23
14.43		-3.13	
14.21	0.62	-3.10	-0.12
RSD=	0.88	RSD=	-3.76
Blas=	7.31	Exp Conc=	10.00
t=	42.66	CF=	0.58

m-Xylene-172			
SPIKED	DEV.	UNSPIKED	DEV.
14.02	0.27	-2.68	0.19
14.28		-2.49	
14.34	0.27	-2.55	-0.10
14.60		-2.66	
14.11	0.53	-2.69	-0.05
14.63		-2.74	
14.45	0.02	-2.87	0.12
14.46		-2.75	
14.42	-0.21	-2.46	0.07
14.20		-2.39	
14.35	0.86	-2.63	0.23
RSD=	1.50	RSD=	-3.17
Blas=	6.98	Exp Conc=	10.00
t=	30.29	CF=	0.59

TABLE 6-7 (continued)

Acetone-192			
SPIKED	DEV.	UNSPIKED	DEV.
-0.21	0.21	-11.40	-0.19
0.00		-11.59	
-0.13	0.21	-11.70	-0.07
0.08		-11.77	
-0.32	0.22	-11.94	0.05
-0.10		-11.89	
-0.10	0.11	-11.67	-0.04
0.01		-11.71	
-0.16	0.31	-11.67	0.08
0.16		-11.59	
0.04	0.15	-11.85	0.11
0.19		-11.74	
-0.04	1.22	-11.71	-0.06
RSD=	344.62	RSD=	-0.62
Bias=	2.17	Exp Conc=	9.50
t=	12.98	CF=	0.81

TABLE 6-8. Compounds Not Meeting Method 301 Criteria in Condenser Samples.

TABLE 6-8 (continued)

Acetonitrile-003			
SPIKED	DEV.	UNSPIKED	DEV.
6.51	-0.73	-0.60	1.46
5.78		0.86	
7.42	2.68	-1.10	1.21
10.09		0.12	
2.66	6.52	-1.38	1.03
9.19		-0.35	
		0.19	0.98
		1.17	
6.94	8.47	-0.14	4.68
RSD =	36.11	RSD =	-497.99
Bias =	-3.42	Exp Conc =	10.50
t =	1.32	CF =	1.48

Acrolein-006			
SPIKED	DEV.	UNSPIKED	DEV.
11.09	0.59	-0.01	0.03
11.68		0.02	
11.82	0.02	-0.03	-0.05
11.84		-0.08	
11.55	0.27	-0.11	-0.14
11.81		-0.24	
11.91	0.09	-0.01	-0.29
12.00		-0.30	
11.83	0.21	0.69	-0.65
12.04		0.03	
12.13	-0.09	0.14	0.19
12.04		0.34	
11.81	1.09	0.04	-0.90
RSD =	1.69	RSD =	586.98
Bias =	0.20	Exp Conc =	11.58
t =	0.66	CF =	0.98

TABLE 8-8 (continued)

Acrylonitrile-009			
SPIKED	DEV.	UNSPIKED	DEV.
7.76	-0.04	0.14	-0.14
7.72		0.00	
7.74	0.12	0.14	0.13
7.86		0.26	
8.75	1.19	0.09	0.01
9.94		0.10	
10.11	-0.08	0.01	-0.08
10.03		-0.07	
		0.89	-0.80
		0.09	
		0.10	0.00
		0.10	
7.74	1.19	0.15	-0.89
RSD=	5.46	RSD=	156.33
Bias=	-2.41	Exp Conc=	10.00
t=	4.97	CF=	1.32

Bromoform-022			
SPIKED	DEV.	UNSPIKED	DEV.
8.99	0.11	-0.34	0.02
9.10		-0.32	
9.11	0.01	-0.27	0.15
9.12		-0.13	
9.43	0.18	-0.09	-0.01
9.61		-0.10	
9.65	-0.02	-0.15	0.02
9.63		-0.13	
9.48	0.08	0.19	-0.21
9.56		-0.02	
9.69	-0.07	-0.04	-0.03
9.63		-0.07	
9.42	0.29	-0.12	-0.05
RSD=	0.73	RSD=	-62.06
Bias=	-0.32	Exp Conc=	9.86
t=	3.12	CF=	1.03

TABLE 6-8 (continued)

1,3-Butadiene-023			
SPIKED	DEV.	UNSPIKED	DEV.
7.42	0.20	0.02	-0.09
7.62		-0.07	
7.66	0.03	-0.23	-0.07
7.69		-0.30	
8.37	0.01	0.24	-0.11
8.38		0.14	
8.45	-0.12	0.13	-0.05
8.33		0.08	
8.24	-0.01	0.08	-0.13
8.23		-0.05	
8.15	0.15	-0.07	0.05
8.30		-0.02	
8.07	0.27	-0.01	-0.39
RSD=	0.99	RSD=	-1026.51
Bias=	-1.64	Exp Conc=	9.72
t=	16.42	CF=	1.20

Carbon Disulfide-028			
SPIKED	DEV.	UNSPIKED	DEV.
7.56	-0.12	1.02	-0.05
7.44		0.97	
7.26	0.25	0.89	0.01
7.50		0.90	
8.78	-0.11	2.19	-0.15
8.66		2.04	
8.76	-0.01	1.99	-0.02
8.75		1.96	
8.48	0.07	2.13	-0.02
8.55		2.11	
8.59	-0.03	2.06	-0.14
8.56		1.92	
8.24	0.04	1.68	-0.37
RSD=	1.07	RSD=	3.66
Bias=	-3.12	Exp Conc=	9.68
t=	28.94	CF=	1.48

TABLE 6-8 (continued)

Carbon Tetrachloride-029			
SPIKED	DEV.	UNSPIKED	DEV.
6.52		0.11	-0.02
5.95	-0.57	0.08	
5.38		0.07	0.02
5.94	0.57	0.09	
7.14		0.20	-0.02
7.10	-0.04	0.18	
7.09		0.23	-0.05
7.10	0.01	0.18	
7.05		0.25	-0.05
7.02	-0.03	0.20	
7.17		0.21	0.00
7.00	-0.17	0.21	
6.71	-0.23	0.17	-0.13
RSD=	3.52	RSD=	14.15
Blas=	-3.44	Exp Conc=	9.98
t=	14.49	CF=	1.53

Carbonyl Sulfide-030			
SPIKED	DEV.	UNSPIKED	DEV.
10.61		0.03	0.12
10.74	0.13	0.15	
10.63		0.09	0.19
10.56	-0.07	0.28	
10.89		0.08	0.00
11.03	0.14	0.07	
11.01		0.09	-0.01
11.07	0.06	0.08	
10.94		0.21	-0.12
10.93	-0.01	0.10	
10.93		0.07	-0.01
10.55	-0.39	0.06	
10.82	-0.13	0.11	0.17
RSD=	1.18	RSD=	68.39
Blas=	0.01	Exp Conc=	10.70
t=	0.10	CF=	1.00

TABLE 6-8 (continued)

Chloroform-039			
SPIKED	DEV.	UNSPIKED	DEV.
14.01	0.12	-0.07	
14.13		0.05	0.12
14.02	-0.01	-0.14	
14.00		-0.13	0.01
14.09	0.24	-0.04	
14.33		-0.02	0.02
14.67	-0.05	-0.01	
14.62		0.01	0.02
14.65	0.05	0.16	
14.70		0.14	-0.02
14.71	0.15	0.00	
14.86		0.00	0.00
14.40	0.51	-0.01	0.15
RSD=	0.64	RSD=	-661.16
Bias=	4.74	Exp Conc=	9.66
t=	47.85	CF=	0.67

Cumene-046			
SPIKED	DEV.	UNSPIKED	DEV.
14.78	0.28	0.20	
15.05		0.18	-0.01
15.03	0.05	0.21	
15.08		0.13	-0.08
13.88	0.44	0.11	
14.31		0.15	0.04
14.74	0.10	0.13	
14.84		0.09	-0.03
14.84	0.33	0.55	
15.17		0.51	-0.04
15.15	0.10	0.36	
15.25		0.30	-0.06
14.84	1.29	0.24	-0.18
RSD=	1.23	RSD=	14.30
Bias=	4.58	Exp Conc=	10.02
t=	24.72	CF=	0.69

TABLE 6-8 (continued)

1,2-Epoxy Butane-075			
SPIKED	DEV.	UNSPIKED	DEV.
9.68	0.04	1.39	
9.72		1.37	-0.02
9.45	-0.41	1.30	
9.04		1.27	-0.04
4.81	0.57	0.83	
5.38		1.24	0.41
5.63	0.39	1.31	
6.02		1.13	-0.19
10.53	0.19	1.57	
10.72		1.36	-0.20
10.62	-0.24	1.89	
10.38		1.49	-0.39
8.50	0.54	1.35	-0.42
RSD=	2.92	RSD=	13.58
Bias=	-3.51	Exp Conc=	10.66
t=	11.39	CF=	1.49

Ethylene Oxide-084			
SPIKED	DEV.	UNSPIKED	DEV.
1.35	0.81	1.07	
2.16		1.58	0.50
2.99	0.14	1.80	
3.13		1.29	-0.51
2.91	-0.19	1.55	
2.72		2.17	0.62
2.13	-0.18	1.94	
1.95		1.45	-0.49
0.67	0.32	2.04	
0.99		1.68	-0.36
0.79	-0.10	2.19	
0.69		1.87	-0.32
1.87	0.80	1.72	-0.55
RSD=	14.24	RSD=	19.63
Bias=	-9.85	Exp Conc=	10.00
t=	22.89	CF=	66.33

TABLE 6-8 (continued)

Methanol-104			
SPIKED	DEV.	UNSPIKED	DEV.
10.62	0.96	0.25	0.38
11.58		0.63	
12.06	0.93	0.12	0.38
12.99		0.50	
8.78	1.45	-0.38	0.33
10.24		-0.04	
		-0.05	-0.16
		-0.21	
11.04	3.33	0.10	0.93
RSD=	6.31	RSD=	194.23
Bias=	2.30	Exp Conc=	8.64
t=	3.18	CF=	0.79

Methyl Chloroform-108			
SPIKED	DEV.	UNSPIKED	DEV.
6.87	0.00	0.61	0.03
6.87		0.64	
6.88	0.04	0.61	-0.03
6.92		0.58	
6.93	0.01	0.81	-0.01
6.93		0.80	
6.87	0.03	0.82	0.05
6.90		0.87	
7.04	-0.02	0.79	-0.04
7.02		0.74	
6.88	0.25	0.78	0.03
7.13		0.81	
6.93	0.30	0.74	0.02
RSD=	1.07	RSD=	3.25
Bias=	-2.44	Exp Conc=	8.64
t=	31.31	CF=	1.39

TABLE 6-8 (continued)

Methyl Iodide-111			
SPIKED	DEV.	UNSPIKED	DEV.
6.57	0.49	-3.19	
7.06		-3.16	0.03
7.02	1.26	-2.36	
8.28		-1.75	0.60
9.00	0.14	1.66	
9.14		0.72	-0.94
9.01	-0.12	0.37	
8.89		0.35	-0.02
8.83	0.29	1.29	
9.12		1.26	-0.03
8.96	-0.05	1.33	
8.91		1.14	-0.19
8.40	2.01	-0.20	-0.54
RSD=	4.79	RSD=	-167.99
Bias=	-1.45	Exp Conc=	10.04
t=	2.78	CF=	1.17

Methyl t-Butyl Ether-115			
SPIKED	DEV.	UNSPIKED	DEV.
3.34	0.84	-0.54	
4.18		-0.60	-0.07
4.18	0.07	-0.50	
4.25		-0.58	-0.08
6.86	0.03	-0.70	
6.89		-0.95	-0.26
6.73	-0.52	-0.78	
6.22		-0.76	0.03
1.13	0.59	-0.69	
1.72		-0.84	-0.15
1.92	0.32	-0.72	
2.23		-0.99	-0.26
4.14	1.33	-0.72	-0.79
RSD=	8.32	RSD=	-16.42
Bias=	-4.78	Exp Conc=	9.64
t=	13.14	CF=	1.98

TABLE 6-8 (continued)

Propylene Oxide-143			
SPIKED	DEV.	UNSPIKED	DEV.
-1.33	0.14	-1.64	0.25
-1.19		-1.40	
-0.81	0.25	-2.72	0.50
-0.56		-2.22	
1.32	0.44	-1.69	-0.40
1.76		-2.09	
1.77	1.88	-1.97	1.06
3.65		-0.91	
0.33	0.94	-2.58	2.25
1.28		-0.34	
1.89	-1.21	0.21	-3.28
0.68		-3.07	
0.73	2.45	-1.70	0.36
RSD=	97.92	RSD=	-70.75
Bias=	-7.61	Exp Conc=	10.04
t=	5.43	CF=	4.13

Vinyl Acetate-166			
SPIKED	DEV.	UNSPIKED	DEV.
8.26	0.08	-0.09	-0.01
8.35		-0.10	
8.35	0.01	-0.08	-0.01
8.36		-0.09	
8.16	0.57	-0.08	0.00
8.73		-0.08	
8.33	-0.07	-0.09	0.02
8.27		-0.07	
8.01	0.22	0.09	-0.13
8.23		-0.04	
8.26	-0.02	-0.08	0.00
8.25		-0.08	
8.30	0.81	-0.07	-0.12
RSD=	2.17	RSD=	-60.14
Bias=	-1.68	Exp Conc=	10.04
t=	9.13	CF=	1.20

TABLE 8-8 (continued)

Vinyl Bromide-167			
SPIKED	DEV.	UNSPIKED	DEV.
8.87	0.01	-0.19	
8.87		-0.08	0.11
8.86	-0.20	-0.15	
8.66		-0.12	0.03
9.31	0.19	0.00	
9.50		-0.05	-0.05
9.44	-0.10	-0.04	
9.33		-0.02	0.02
9.32	0.09	0.01	
9.42		0.05	0.04
9.44	0.04	-0.01	
9.48		-0.03	-0.03
9.21	0.02	-0.05	0.12
RSD=	0.98	RSD=	-73.91
Bias=	-0.74	Exp Conc=	10.00
t=	7.50	CF=	1.08

Vinyl Chloride-168			
SPIKED	DEV.	UNSPIKED	DEV.
12.91	0.09	-0.13	
13.00		-0.09	0.04
12.93	-0.13	0.04	
12.80		-0.45	-0.49
13.10	0.23	-0.10	
13.33		-0.15	-0.05
13.28	0.17	-0.16	
13.45		-0.17	-0.01
13.19	0.04	0.03	
13.23		-0.16	-0.19
13.27	-0.35	-0.23	
12.93		-0.19	0.04
13.12	0.06	-0.15	-0.66
RSD=	1.05	RSD=	-104.29
Bias=	3.26	Exp Conc=	10.00
t=	15.86	CF=	0.75

TABLE 6-8 (continued)

m-Xylene-172			
SPIKED	DEV.	UNSPIKED	DEV.
16.53	0.88	2.50	-0.79
17.41		1.71	
17.28	-0.22	1.38	0.07
17.06		1.45	
17.89	0.43	2.22	-0.16
18.33		2.06	
18.19	0.35	2.29	-0.08
18.54		2.20	
18.06	0.25	2.17	-0.17
18.31		2.00	
18.09	0.17	2.16	-0.22
18.26		1.93	
17.83	1.87	2.01	-1.36
RSD=	1.79	RSD=	12.39
Bias=	5.82	Exp Conc=	10.00
t=	14.38	CF=	0.63

Acetone-192			
SPIKED	DEV.	UNSPIKED	DEV.
7.69	1.55	0.90	-0.11
9.24		0.79	
9.32	0.34	0.78	-0.10
9.67		0.68	
6.28	2.26	0.29	0.03
8.54		0.31	
9.71	0.15	0.25	0.04
9.86		0.29	
5.23	3.49	2.72	-1.93
8.72		0.79	
9.73	0.23	0.43	-0.07
9.96		0.36	
8.66	8.02	0.71	-2.14
RSD=	14.84	RSD=	78.24
Bias=	-1.55	Exp Conc=	9.50
t=	1.11	CF=	1.20

**TABLE 6-9. Compounds Not Meeting Method 301 Criteria
in Concentrated Samples.**

TABLE 6-9 (continued)

Acrylonitrile-009			
SPIKED	DEV.	UNSPIKED	DEV.
4.11	0.23	-0.57	0.52
4.34		-0.05	
2.79	0.90	-0.15	-0.28
3.69		-0.42	
2.03	-0.92	0.01	-0.08
1.11		-0.07	
3.01	0.22	-0.21	0.16
RSD=	17.73	RSD=	-117.42
Bias=	-16.78	Exp Conc=	20.00
t=	28.60	CF=	6.22

Allyl Chloride-010			
SPIKED	DEV.	UNSPIKED	DEV.
20.60	-3.49	1.06	-1.06
17.11		0.01	
14.98	-1.80	0.56	1.17
13.18		1.72	
9.80	0.22	1.12	0.07
10.01		1.19	
14.28	-5.07	0.94	0.19
RSD=	11.23	RSD=	68.24
Bias=	-6.66	Exp Conc=	20.00
t=	3.85	CF=	1.50

Bromoform-022			
SPIKED	DEV.	UNSPIKED	DEV.
29.75	-3.26	1.19	-0.87
26.50		0.32	
24.15	-0.38	0.13	0.28
23.77		0.41	
26.00	-1.46	1.30	-1.21
24.54		0.09	
25.78	-5.10	0.57	-1.80
RSD=	5.68	RSD=	108.33
Bias=	5.21	Exp Conc=	20.00
t=	3.28	CF=	0.79

TABLE 6-9 (continued)

Carbon Tetrachloride-029			
SPIKED	DEV.	UNSPIKED	DEV.
11.21	-2.36	0.02	-0.01
8.85		0.01	
8.44	-0.46	0.02	0.02
7.98		0.04	
10.46	-1.30	0.05	-0.04
9.16		0.01	
9.35	-4.13	0.03	-0.03
RSD=	11.95	RSD=	67.36
Bias=	-10.68	Exp Conc=	20.00
t=	9.55	CF=	2.15

Methyl Chloroform-108			
SPIKED	DEV.	UNSPIKED	DEV.
10.21	-1.21	0.25	0.55
8.99		0.80	
12.62	0.10	1.56	-0.43
12.72		1.14	
11.13	-1.12	0.94	0.12
RSD=	4.47	RSD=	30.37
Bias=	-9.80	Exp Conc=	20.00
t=	17.11	CF=	1.96

Methyl Isobutane Ketone-112			
SPIKED	DEV.	UNSPIKED	DEV.
40.00	7.90	6.22	-2.57
47.90		3.65	
39.20	3.91	1.37	1.09
43.11		2.46	
42.55	11.81	3.42	-1.48
RSD=	8.46	RSD=	33.28
Bias=	19.13	Exp Conc=	20.00
t=	5.07	CF=	0.51

TABLE 6-9 (continued)

Methyl Methacrylate-114			
SPIKED	DEV.	UNSPIKED	DEV.
27.80	-3.96	0.86	-0.65
23.84		0.20	
22.00	-0.13	0.53	-0.47
21.87		0.05	
23.88	-0.14	0.29	-0.18
23.74		0.11	
23.85	-4.23	0.34	-1.31
RSD =	6.79	RSD =	99.58
Bias =	3.51	Exp Conc =	20.00
t =	2.13	CF =	0.85

Propylene Dichloride-142			
SPIKED	DEV.	UNSPIKED	DEV.
25.81	7.11	4.14	-3.91
32.92		0.23	
24.71	0.74	2.28	5.10
25.46		7.38	
27.22	7.85	3.51	1.18
RSD =	10.72	RSD =	74.83
Bias =	3.72	Exp Conc =	20.00
t =	0.95	CF =	0.84

Styrene-147			
SPIKED	DEV.	UNSPIKED	DEV.
22.48	-1.47	3.29	-1.81
21.00		1.48	
18.22	0.79	1.94	5.34
19.01		7.28	
20.18	-0.68	3.50	3.53
RSD =	3.38	RSD =	65.81
Bias =	-3.32	Exp Conc =	20.00
t =	1.38	CF =	1.20

1,1,2-Trichloroethane-159			
SPIKED	DEV.	UNSPIKED	DEV.
35.82	-2.36	0.95	0.01
33.46		0.96	
29.01	0.02	1.42	1.41
29.03		2.83	
30.06	-1.99	0.27	0.01
28.07		0.28	
30.91	-4.32	1.12	1.43
RSD=	4.07	RSD=	51.42
Bias=	9.79	Exp Conc=	20.00
t=	7.07	CF=	0.67

2,2,4-Trimethylpentane-165			
SPIKED	DEV.	UNSPIKED	DEV.
45.23	-42.43	8.29	-7.36
2.79		0.93	
18.34	-14.55	2.50	1.71
3.79		4.21	
7.31	-2.01	4.18	6.08
5.30		10.26	
13.79	-59.00	5.06	0.42
RSD=	132.92	RSD=	78.21
Bias=	-11.27	Exp Conc=	20.00
t=	0.60	CF=	2.29

TABLE 6-9 (continued)

Vinyl Acetate-166			
SPIKED	DEV.	UNSPIKED	DEV.
4.52	2.92	-0.25	0.06
7.44		-0.20	
12.71	-4.90	-0.25	0.08
7.80		-0.16	
8.12	-1.98	-0.22	0.14
RSD =	35.15	RSD =	-23.58
Bias =	-11.67	Exp Conc =	20.00
t =	4.09	CF =	2.40

Vinylidene Chloride-169			
SPIKED	DEV.	UNSPIKED	DEV.
3.41	-2.71	-0.25	0.15
0.70		-0.11	
1.11	0.80	0.02	0.01
1.91		0.02	
0.67	0.07	-0.01	0.03
0.74		0.02	
1.42	-1.84	-0.05	0.18
RSD =	81.08	RSD =	-116.48
Bias =	-18.53	Exp Conc =	20.00
t =	16.04	CF =	13.57

TABLE 6-10. CEM and Flow Data.

Note: Effluent flow given in dry standard cubic feet per minute (DSCM).

Summary of CEM Test Results for Cylinder #1

Date	Spike	Run #	Sample Time	Sample Conditioning	CO ppmd	O2 %d	CO2 %d	THC ppmw	%H2O	Avg. delta P	Effluent Vol Flow (DSCM)
02/02/93		1	1043-1045	Condenser	41.6	8.8	10.5		7	0.3	34,421
		2	1050-1053	Condenser	185.7	9.3	9.9				
		3	1057-1059	Condenser	87.3	8.0	10.8				
		4	1103-1104	Condenser	314.7	9.3	9.9				
	✓	5	1111-1114	Condenser							
	✓	6	1135-1137	Condenser							
	✓	7	1143-1145	Condenser							
	✓	8	1151-1153	Condenser							
02/06/93		9	1412-1413	Condenser	28.5	9.2	9.9				
		10	1416-1418	Condenser	30.5	9.4	9.8				
		11	1422-1423	Condenser	31.9	9.4	9.7				
		12	1428-1430	Condenser	24.5	7.5	7.5				
	✓	13	1436-1437	Condenser							
	✓	14	1440-1441	Condenser							
	✓	15	1426-1427	Condenser							
	✓	16	1450-1451	Condenser							
		17	1459-1500	Condenser	32.6	9.7	9.4				
		18	1504-1505	Condenser	23.2	7.4	7.6				
		19	1508-1508	Condenser	21.4	7.0	7.8				
		20	1512-1513	Condenser	27.5	7.3	7.6				
	✓	21	1520-1521	Condenser							
	✓	22	1524-1525	Condenser							
	✓	23	1528-1529	Condenser							
	✓	24	1533-1534	Condenser							

TABLE 6-10 (continued)

Summary of CEM Test Results for Cylinder #2

Date	Spike	Run #	Sample Time	Sample Conditioning	CO ppmd	O2 %d	CO2 %d	THC ppmw	%H2O	Avg. delta P	Effluent Vol Flow (DSCM)
02/02/93		1	1245-1249	Condenser	24.9	8.7	10.4		7	0.3	34,261
		2	1252-1254	Condenser	25.5	8.8	10.5				
		3	1258-1300	Condenser	28.8	8.5	10.7				
		4	1303-1305	Condenser	25.7	8.4	10.8				
	✓	5	1322-1324	Condenser							
	✓	6	1329-1333	Condenser							
	✓	7	1338-1341	Condenser							
	✓	8	1348-1350	Condenser							
		9	1426-1428	Condenser							
		10	1433-1435	Condenser							
02/08/93		11	1444-1446	Condenser					No CEM Data Available		
		12	1450-1452	Condenser							
	✓	13	1459-1501	Condenser							
	✓	14	1506-1508	Condenser							
	✓	15	1513-1515	Condenser							
	✓	16	1519-1521	Condenser							
		17	1529-1531	Condenser	51.7	9.9	9.4				
		18	1536-1538	Condenser	65.2	9.7	9.7				
		19	1543-1545	Condenser	43.3	9.8	9.6				
		20	1550-1552	Condenser	31.5	8.9	10.5				
	✓	21	1559-1601	Condenser							
	✓	22	1606-1608	Condenser							
	✓	23	1614-1616	Condenser							
	✓	24	1621-1623	Condenser							

Summary of CEM Test Results for Cylinder #3

Date	Spike	Run #	Sample Time	Sample Conditioning	CO ppmd	O2 %d	CO2 %d	THC ppmw	%H2O	Avg. delta P	Effluent Vol Flow (DSCM)
02/02/93		1	1523-1525	Condenser	24.4	8.8	10.4		7	0.3	34,241
		2	1528-1530	Condenser	25.1	8.8	10.5				
		3	1534-1535	Condenser	26.5	9.0	10.3				
		4	1539-1541	Condenser	23.6	8.8	10.4				
	✓	5	1548-1549	Condenser							
	✓	6	1553-1555	Condenser							
	✓	7	1559-1601	Condenser							
	✓	8	1604-1606	Condenser							
		9	0938-0940	Condenser	59.8	8.7	10.7				
		10	0945-0947	Condenser	60.2	8.7	10.6				
02/08/93		11	0951-0953	Condenser	61.2	8.7	10.6				
		12	0957-0959	Condenser	63.3	8.5	10.7				
	✓	13	1005-1008	Condenser							
	✓	14	1011-1014	Condenser							
	✓	15	1021-1023	Condenser							
	✓	16	1035-1037	Condenser							
		17	1046-1048	Condenser	70.0	8.9	10.5				
		18	1055-1057	Condenser	76.1	9.0	10.4				
		19	1105-1107	Condenser	65.3	8.7	10.6				
		20	1115-1117	Condenser	62.0	9.1	10.3				
	✓	21	1125-1127	Condenser							
	✓	22	1132-1134	Condenser							
	✓	23	1140-1142	Condenser							
	✓	24	1147-1149	Condenser							

TABLE 6-10 (continued)

Summary of CEM Test Results for Cylinder #4

Date	Spike	Run #	Sample Time	Sample Conditioning	CO ppmd	O2 %d	CO2 %d	THC ppmw	%H2O	Avg. delta P	Effluent Vol. Flow (DSCM)
02/02/93		1	1639-1641	Condenser	29.7	8.8	10.5		7	0.3	34,266
		2	1646-1648	Condenser	29.3	8.8	10.3				
		3	1652-1653	Condenser	29.8	8.2	11.0				
		4	1657-1659	Condenser	38.7	8.7	10.5				
	✓	5	1707-1709	Condenser							
	✓	6	1714-1717	Condenser							
	✓	7	1722-1724	Condenser							
	✓	8	1729-1730	Condenser							
		9	1637-1639	Condenser	33.4	10.0	9.2				
		10	1644-1646	Condenser	29.4	9.8	9.7				
		11	1651-1654	Condenser	25.5	9.3	9.9				
		12	1658-1700	Condenser	26.7	9.5	9.9				
	✓	13	1707-1710	Condenser							
	✓	14	1715-1717	Condenser							
	✓	15	1721-1723	Condenser							
	✓	16	1728-1730	Condenser							
		17	1736-1738	Condenser	35.3	9.7	9.7				
		18	1742-1744	Condenser	42.0	9.4	10.0				
		19	1749-1751	Condenser	35.2	9.4	10.1				
		20	1755-1758	Condenser	34.1	9.4	10.0				
	✓	21	1806-1808	Condenser							
	✓	22	1813-1816	Condenser							
	✓	23	1821-1823	Condenser							
	✓	24	1827-1829	Condenser							

Summary of CEM Test Results for Cylinder #5

Date	Spike	Run #	Sample Time	Sample Conditioning	CO ppmd	O2 %d	CO2 %d	THC ppmw	%H2O	Avg. delta P	Effluent Vol. Flow (DSCM)
02/03/93		1	1031-1033	Condenser	147.8	9.4	9.6				
		2	1037-1039	Condenser	181.4	9.4	9.6				
		3	1044-1046	Condenser	218.6	10.1	9.0				
		4	1055-1057	Condenser	372.5	8.9	10.1				
	✓	5	1126-1127	Condenser							
02/08/93	✓	6	1131-1133	Condenser							
	✓	7	1138-1140	Condenser							
	✓	8	1144-1146	Condenser							
		9	1207-1209	Condenser	70.6	9.4	9.9				
		10	1215-1217	Condenser	68.9	9.4	10.0				
		11	1223-1225	Condenser	71.6	9.5	9.9				
		12	1232-1234	Condenser	65.6	9.7	9.6				
	✓	13	1243-1246	Condenser							
	✓	14	1252-1254	Condenser							
	✓	15	1259-1302	Condenser							
	✓	16	1307-1309	Condenser							
		17	1318-1320	Condenser	65.1	9.4	10.0				
		18	1325-1327	Condenser	69.9	9.3	10.0				
		19	1332-1334	Condenser	96.1	9.2	10.2				
		20	1338-1341	Condenser	75.7	9.5	9.8				
	✓	21	1349-1350	Condenser							
	✓	22	1355-1357	Condenser							
	✓	23	1402-1404	Condenser							
	✓	24	1409-1411	Condenser							

TABLE 6-10 (continued)

Summary of CEM Test Results for Cylinder #6

Date	Spike	Run #	Sample Time	Sample Conditioning	CO ppmd	O2 %d	CO2 %d	THC ppmw	Avg. %H2O	Effluent Vol delta P	Flow (DSCM)
02/03/93		1	1602-1605	Condenser	29.4	8.7	10.3		7	0.3	34,274
		2	1611-1612	Condenser	31.6	8.8	10.1				
		3	1616-1617	Condenser	29.6	8.7	10.3				
		4	1620-1625	Condenser	29.8	8.6	10.3				
02/09/93	✓	5	1636-1638	Condenser							
	✓	6	1642-1644	Condenser							
	✓	7	1648-1650	Condenser	376.9	10.4	9.0				
	✓	8	1653-1655	Condenser	327.7	11.4	8.2				
		9	1256-1258	Condenser	160.0	8.7	10.6				
		10	1302-1305	Condenser	82.5	9.5	10.0				
		11	1310-1312	Condenser							
		12	1315-1318	Condenser							
	✓	13	1327-1329	Condenser	43.8	9.1	10.3				
	✓	14	1335-1337	Condenser	61.6	9.0	10.4				
	✓	15	1344-1346	Condenser	41.8	9.4	9.9				
	✓	16	1352-1354	Condenser	43.2	8.7	10.7				
		17	1400-1402	Condenser							
		18	1408-1410	Condenser							
		19	1414-1416	Condenser							
		20	1422-1424	Condenser							
	✓	21	1433-1435	Condenser							
	✓	22	1440-1442	Condenser							
	✓	23	1447-1449	Condenser							
	✓	24	1453-1455	Condenser							

TABLE 6-10 (continued)

Summary of CEM Test Results for Cylinder #7

Date	Spike	Run #	Sample Time	Sample Conditioning	CO ppmd	O2 %d	CO2 %d	THC ppmw	%H2O	Avg. delta P	Effluent Vol. Flow (DSCM)
02/03/93		1	1200-1201	Condenser	28.1	9.0	10.1				
		2	1206-1207	Condenser	30.8	8.9	10.1				
		3	1212-1214	Condenser	29.2	8.7	10.3				
		4	1219-1220	Condenser	29.3	8.6	10.6				
	✓	5	1306-1307	Condenser							
	✓	6	1312-1313	Condenser							
	✓	7	1317-1318	Condenser							
	✓	8	1322-1324	Condenser							
		9	0951-0953	Condenser	45.4	8.3	11.1				
		10	1002-1004	Condenser	50.5	8.4	11.0				
02/09/93		11	1012-1014	Condenser	51.5	8.3	11.1				
		12	1022-1024	Condenser	45.0	8.8	10.7				
	✓	13	1029-1031	Condenser							
	✓	14	1037-1039	Condenser							
	✓	15	1045-1047	Condenser							
	✓	16	1054-1056	Condenser							
		17	1102-1104	Condenser	49.8	9.9	10.5				
		18	1110-1112	Condenser	53.0	9.1	10.4				
		19	1119-1121	Condenser	49.7	8.9	10.6				
		20	1126-1128	Condenser	51.5	9.0	10.5				
	✓	21	1135-1137	Condenser							
	✓	22		Condenser							
	✓	23		Condenser							
	✓	24		Condenser							

TABLE 6-10 (continued)

Summary of CEM Test Results for Cylinder #8

Date	Spike	Run #	Sample Time	Sample Conditioning	CO ppmd	O2 %d	CO2 %d	THC ppmw	%H2O	Avg. delta P	Effluent Vol. Flow (DSCM)
02/03/93		1	1343-1345	Condenser	22.6	7.0	8.3		7	0.3	34,301
		2	1348-1349	Condenser	20.1	6.9	8.3				
		3	1353-1355	Condenser	25.9	8.6	10.7				
		4	1359-1400	Condenser	23.6	8.6	10.8				
02/09/93	✓	5	1506-1508	Condenser							
	✓	6	1510-1513	Condenser							
	✓	7	1516-1516	Condenser							
	✓	8	1531-1533	Condenser							
		9	1156-1158	Condenser	52.4	9.2	10.3				
		10	1204-1206	Condenser	55.2	9.1	10.4				
		11	1212-1214	Condenser	55.6	9.4	10.0				
		12	1219-1222	Condenser	52.1	9.1	10.3				
	✓	13	1228-1231	Condenser							
	✓	14	1238-1240	Condenser							
	✓	15		Condenser							
	✓	16		Condenser							
		17		Condenser							
		18		Condenser							
		19		Condenser							
		20		Condenser							
	✓	21		Condenser							
	✓	22		Condenser							
	✓	23		Condenser							
	✓	24		Condenser							

Plan Out of Spike Cylinder Gas

Summary of CEM Test Results for Cylinder #9

Date	Spike	Run #	Sample Time	Sample Conditioning	CO ppmd	O2 %d	CO2 %d	THC ppmw	%H2O	Avg. delta P	Effluent Vol. Flow (DSCM)
01/31/93		1	1346-1348	Condenser	26.6	9.5	9.5		7	0.3	34,279
		2	1352-1354	Condenser	23.8	8.7	10.2				
		3	1358-1400	Condenser	34.7	10.0	9.0				
		4	1405-1408	Condenser	28.8	9.6	9.2				
	✓	5	1416-1418	Condenser							
	✓	6	1424-2426	Condenser							
	✓	7	1432-1434	Condenser							
	✓	8	1440-1441	Condenser							
02/06/93		9	0928-0930	Condenser	59.0	9.0	10.2				
		10	0934-0937	Condenser	52.3	9.0	10.3				
		11	0940-0942	Condenser	51.7	8.9	10.3				
		12	0946-0948	Condenser	51.0	8.8	10.4				
	✓	13	1004-1006	Condenser							
	✓	14	1009-1010	Condenser							
	✓	15	1015-1016	Condenser							
	✓	16	1020-1022	Condenser							
		17	1031-1033	Condenser	52.6	8.9	10.2				
		18	1035-1036	Condenser	49.9	9.0	10.2				
		19	1040-1041	Condenser	45.1	8.8	10.2				
		20	1044-1046	Condenser	48.9	9.0	10.1				
	✓	21	1055-1056	Condenser							
	✓	22	1101-1102	Condenser							
	✓	23	1104-1105	Condenser							
	✓	24	1108-1110	Condenser							

TABLE 6-10 (continued)

Summary of CEM Test Results for Cylinder #11

Date	Spike	Run #	Sample Time	Sample Conditioning	CO ppmd	O2 %d	CO2 %d	THC ppmw	%H2O	Avg. delta P	Effluent Vol. Flow (DSCM)
01/31/93		1	1503-1507	Condenser	36.0	10.0	8.8		7	0.3	34,342
		2	1512-1515	Condenser	32.8	9.9	8.9				
		3	1520-1522	Condenser	31.6	9.7	9.2				
		4	1526-1528	Condenser	31.9	9.8	9.1				
02/06/93	✓	5	1540-1542	Condenser							
	✓	6	1547-1550	Condenser							
	✓	7	1555-1558	Condenser							
	✓	8	1602-1604	Condenser							
		9	1151-1153	Condenser	59.3	9.1	9.9				
		10	1156-1158	Condenser	60.2	9.1	10.0				
		11	1204-1206	Condenser	68.5	9.0	10.1				
		12	1209-1210	Condenser	46.7	7.4	7.5				
	✓	13	1216-1218	Condenser							
	✓	14	1222-1223	Condenser							
	✓	15	1228-1229	Condenser							
	✓	16	1233-1235	Condenser							
		17	1241-1243	Condenser	36.3	9.2	9.8				
		18	1250-1252	Condenser	33.7	8.6	10.4				
		19	1254-1256	Condenser	34.4	9.1	10.0				
		20	1301-1303	Condenser	25.5	7.0	7.9				
	✓	21	1306-1308	Condenser							
	✓	22	1312-1314	Condenser							
	✓	23	1318-1320	Condenser							
	✓	24	1323-1325	Condenser							

Summary of CEM Test Results for Cylinder #12

Date	Spike	Run #	Sample Time	Sample Conditioning	CO ppmd	O ₂ %d	CO ₂ %d	THC ppmw	%H ₂ O	Avg. delta P	Effluent Vol. Flow (DSCM)
01/31/93		1	1622-1624	Condenser	30.0	9.4	9.3		7	0.3	34,483
		2	1627-1629	Condenser	32.7	9.6	9.2				
		3	1633-1635	Condenser	35.4	9.8	9.1				
		4	1640-1641	Condenser	41.5	10.2	8.8				
02/05/93	✓	5	1649-1650	Condenser							
	✓	6	1654-1655	Condenser							
	✓	7	1659-1700	Condenser							
	✓	8	1705-1706	Condenser							
		9	0940-0942	Condenser	50.3	8.6	10.6				
		10	0947-0950	Condenser	52.7	8.7	10.5				
		11	0954-0956	Condenser	52.0	8.6	10.6				
		12	1000-1002	Condenser	50.3	8.2	11.0				
	✓	13	1012-1215	Condenser							
	✓	14	1019-1021	Condenser							
	✓	15	1025-1027	Condenser							
	✓	16	1034-1037	Condenser							
		17	1043-1045	Condenser	55.9	8.6	10.5				
		18	1049-1051	Condenser	54.9	8.6	10.5				
		19	1054-1056	Condenser	84.4	9.1	10.1				
		20	1102-1104	Condenser	71.1	8.7	10.4				
	✓	21	1111-1113	Condenser							
	✓	22	1117-1121	Condenser							
	✓	23	1128-1132	Condenser							
	✓	24	1141-1144	Condenser							

TABLE 6-10 (continued)

TABLE 6-11. Compounds Not Detected Using Sample Concentration.

SPECIES NOT DETECTED USING
SAMPLE CONCENTRATION ON TENAX

<u>Species:</u>	<u>Boiling Point:</u>	<u>Water Solubility:</u>
Acetone#	BP= 56.2°C	miscible
Acetonitrile#	BP= 81.6°C	miscible
Acrolein#	BP= 52.5°C	40:100
Bromomethane†	BP= 3.6°C	0.09:100
1,3-Butadiene†	BP=-4.5°C	insoluble
1,2-Butylene Oxide*	BP= 63°C	unknown
t-Butyl Methyl Ether*	BP= 53°C	slightly soluble
Carbon Disulfide†	BP= 46.5°C	0.22:100
Carbonyl Sulfide†	BP=-50.2°C	100cc:100ml (gas)
Chloromethane†	BP=-24.22°C	400cc:100ml (gas)
Ethyl Chloride†	BP= 12.3°C	0.57:100
Ethylene Oxide†	BP= 10.7°C	∞
Methanol#	BP= 64.7°C	miscible
Methyl Iodide#	BP= 42.5°C	1.4:100
Methylene Chloride†	BP= 39.8°C	2:100
Propylene Oxide#	BP= 34.2°C	65:100
Vinyl Bromide†	BP= 15.8°C	insoluble
Vinyl Chloride†	BP=-13.9°C	slightly soluble

Reason for Non-Detection:

† = low boiling point (<50°C)

= high water solubility

* = unknown reason

TABLE 6-12. Compounds Detected Using Sample Concentration.

SPECIES DETECTED USING
SAMPLE CONCENTRATION ON TENAX

<u>Species Detected: <25% of Spike</u>	<u>Boiling Point:</u>	<u>Water Solubility:</u>
Acrylonitrile	BP= 77.3°C	7.35:100
1,2-Dichloroethane	BP= 83°C	1:120
<u>Species Detected: >25% of Spike</u>		
Benzene	BP= 80.1°C	1:1430
Bromoform	BP= 149°C	1:800
Carbon Tetrachloride	BP= 76.7°C	1:2000
Chlorobenzene	BP= 132°C	insoluble
Chloroform	BP= 62°C	1:200
3-Chloropropylene	BP= 44°C	slightly soluble
Cumene	BP= 152°C	insoluble
1,2-Dibromoethane	BP= 131°C	1:250
1,2-Dibromomethane	BP= 97°C	1.2:100
1,2-Dichloropropane	BP= 95°C	slightly soluble
Ethyl Benzene	BP= 136.3°C	insoluble
n-Hexane	BP= 69°C	insoluble
Isooctane	BP= 99.3°C	insoluble
Methyl Isobutyl Ketone	BP= 119°C	1.9:100
Methyl Methacrylate	BP= 100°C	v. slightly sol.
Methyl Ethyl Ketone	BP= 73.4°C	27.5:100
2-Nitropropane	BP= 120.3°C	1.7:100
Styrene	BP= 145°C	sparingly soluble
Tetrachloroethylene	BP= 121°C	1:1000
Toluene	BP= 110.6°C	v. slightly sol.
1,1,1-Trichloroethane*	BP= 74.1°C	insoluble
1,1,2-Trichloroethane	BP= 113.5°C	insoluble
Trichloroethylene	BP= 86.7°C	insoluble
Vinyl Acetate	BP= 72°C	1:50
m-Xylene	BP= 139.3°C	insoluble
o-Xylene	BP= 144°C	insoluble
p-Xylene	BP= 138.4°C	insoluble
