



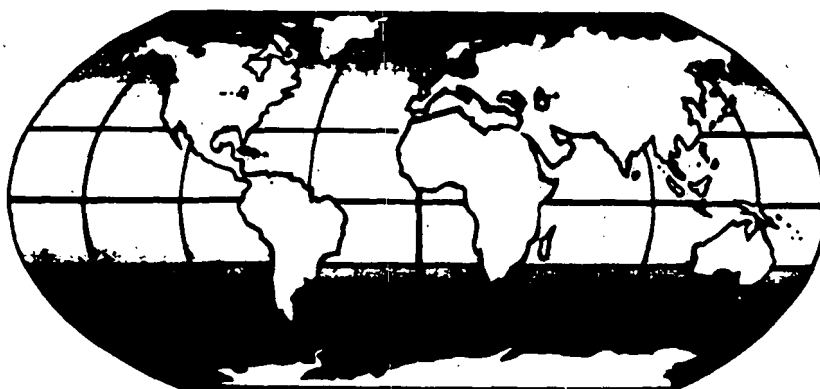
# Design for the Environment Program

announces:

## Alternative Synthetic Design for Pollution Prevention

A One-Day Symposium Presented as part of the  
American Chemical Society's 206th National Meeting

**August 22-27, 1993**



**Chicago, Illinois**

The United States Environmental Protection Agency, as part of its Design for the Environment program, is sponsoring a symposium titled "Alternative Synthetic Design for Pollution Prevention" to be presented at the 206th National Meeting of the American Chemical Society. The goal of the one-day symposium is to stimulate thinking and research in pollution-preventing chemical synthesis. Six of the research papers to be presented were sponsored by grants from the Environmental Protection Agency (EPA) or the National Science Foundation (NSF).

Many chemists have been trained to design synthetic sequences to produce the greatest yield without considering the potential pollution caused by the synthesis. When heavily-polluting synthetic sequences are used to produce high volumes of chemical compounds for industrial applications, the associated cost to human health and the environment can be high. The development of alternative synthetic pathways which avoid or reduce the use of toxic chemicals will provide chemical producers with powerful tools for pollution prevention.

The Alternative Synthetic Design Symposium will:

- feature research aimed at developing practical alternative synthetic pathways for both fine chemicals and industrial commodity chemicals, and
- describe NSF/EPA grant programs to encourage further research in alternative synthesis

Research to be presented includes pollution-preventing synthetic routes using such features as visible light catalysis, microbial catalysis and supercritical carbon dioxide as a solvent. Also on the program are papers describing synthetic routes to avoid the use of benzene in the synthesis of styrene and other aromatics, routes to avoid the use of phosgene in the synthesis of urethanes and isocyanates, and routes to avoid the use of toxic, air-sensitive Lewis acids as an alternative to the Friedel-Crafts reaction.

# Division of Environmental Chemistry Symposium Alternative Synthetic Design for Pollution Prevention

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## SESSION ONE

Session Chairman: Dr. Paul T. Anastas  
Office of Pollution Prevention and Toxics  
U.S. Environmental Protection Agency

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- **Introductory Remarks**  
--Dr. Paul Anastas, U.S. Environmental Protection Agency
  - **Green Technology's Challenge to Synthetic Chemists: Environmentally Benign Chemical Synthesis for the Economy and the Environment**  
--Dr. Kenneth Hancock, National Science Foundation
  - **The UCLA Styrene Process**  
--Dr. Orville Chapman, UCLA
  - **Designing Microbes to be Synthetic Catalysts**  
--Dr. John Frost, Purdue University
  - **Supercritical Carbon Dioxide as a Medium for Conducting Free Radical Reactions**  
--Dr. James Tanko, Virginia Polytechnic University
  - **Generation of Urethanes and Isocyanates from Amines and Carbon Dioxide**  
--Dr. Dennis Riley, Monsanto Corporate Research
  - **Homogeneous Catalytic Carbonylation of Nitroaromatics: An Alternative to Phosgene Use**  
--Dr. Wayne Gladfelter, University of Minnesota
  - **Nucleophilic Aromatic Substitution for Hydrogen: New Halide Free Routes for the Production of Aromatic Amines**  
--Dr. Michael Stern, Monsanto Corporate Research
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## SESSION TWO

Session Chairman: Dr. Carol A. Farris  
Office of Pollution Prevention and Toxics  
U.S. Environmental Protection Agency

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- **Pollution Prevention Through Alternate Synthetic Pathways at the United States Environmental Protection Agency**  
--Dr. Paul Anastas, U.S. Environmental Protection Agency
- **Preparative Reactions Using Visible Light -- High Yields from Pseudoelectrochemical Transformation**  
--Dr. Gary Epling, University of Connecticut
- **A Photochemical Alternative to the Friedel-Crafts Reaction--**  
--Dr. George Kraus, Department of Chemistry
- **SELECTFLUOR™ -- A Safe, Effective Reagent for the Selective Fluorination of Organic Substrates**  
--Dr. Guido Pez, Air Products and Chemicals, Inc.
- **Chemistry and Catalysis: Key Elements of Environmentally-Safer Processes**  
--Dr. Leo E. Manzer, DuPont Company
- **Alternate Syntheses and Other Source Reduction Opportunities for Premanufacture Notification Substances at the U.S. Environmental Protection Agency**  
--Dr. Carol Farris, U.S. Environmental Protection Agency
- **Computer Assisted Alternative Synthetic Design for Pollution Prevention Initiatives at the U.S. EPA**  
--Dr. J. Dirk Nies, Dynamac Corporation
- **Concluding Remarks**  
--Dr. Paul Anastas, U.S. Environmental Protection Agency

For more information contact Dr. Carol Farris, U.S. EPA, (202) 260-1732, fax (202) 260-0981

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## **What is Design for the Environment?**

The Design for the Environment (DfE) Program in EPA's Office of Pollution Prevention and Toxics harnesses EPA's expertise and leadership to facilitate information exchange and research on pollution prevention efforts. DfE works with both large and small businesses on a voluntary basis, and its wide-ranging projects include:

- Changing general businesses practices to provide incentives for pollution prevention efforts.
- Working with businesses and trade associations in specific industries to evaluate the risks, performance, and costs of alternative chemicals, processes, and technologies.
- Helping individual businesses undertake environmental design efforts through the application of specific tools and methods.