

Matthew P. Fraser

Environmental Science and Engineering
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Education

Ph.D. Environmental Engineering Science 1998
Minor in Geology and Planetary Science
California Institute of Technology

Thesis research: Analysis and modeling of carbonaceous air pollutants in the Los Angeles area with an emphasis on measuring single organic compounds in the vapor and particle phases.

M.S. Environmental Engineering Science 1993
California Institute of Technology

B. S. with University Honors Chemical Engineering 1991
Carnegie Mellon University

Professional Experience

Assistant Professor 1998-present
Environmental Science and Engineering
Rice University

Graduate Research and Teaching Assistant 1991-1997
California Institute of Technology

Research Interests

Measurement and analysis of carbonaceous air pollutants in the atmosphere with an emphasis on quantifying single organic compounds in the vapor and particle phases.

Funded Research

- “Development and application of a real-time optical sensor for atmospheric formaldehyde”
Co-PI for a joint project with the Electrical and Computer Engineering Department at Rice University funded by the Gulf Coast Hazardous Substance Research Center, September 1999.
Total Funding: \$150,245.
- “Ambient sampling for biogenic hydrocarbons and their atmospheric reaction products”
Co-PI for a joint project with researchers from the University of Texas-Austin and the National Center for Atmospheric Research funded by the Texas Natural Resources Conservation Commission, June 1998.
Total Funding: \$95,000.

Publications

- Fraser, M. P.; Grosjean, E.; Grosjean, D.; Rasmussen, R. A.; Cass, G. R. (1996) Air Quality Model Evaluation Data for Organics. 1. Bulk Chemical Composition and Gas/Particle Distribution Factors *Environ. Sci. & Technol.* **30**, 1731-1743.

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- Grosjean, E.; Grosjean, D.; Fraser, M. P.; Cass, G. R. (1996) Air Quality Model Evaluation Data for Organics. 2. C₁ – C₁₄ Carbonyls in Los Angeles Air *Environ. Sci. & Technol.* **30**, 2687-2703.
- Grosjean, E.; Grosjean, D.; Fraser, M. P.; Cass, G. R. (1996) Air Quality Model Evaluation Data for Organics. 3. Peroxyacetyl Nitrate and Peroxypropionyl Nitrate in Los Angeles Air. *Environ. Sci. & Technol.* **30**, 2704-2714.
- Fraser, M. P.; Cass, G. R.; Rasmussen, R. A.; Simoneit, B. R. T. (1997) Air Quality Model Evaluation Data for Organics. 4. C₂ - C₃₆ Non-Aromatic Hydrocarbons. *Environ. Sci. & Technol.* **31**, 2356-2367.
- Fraser, M. P.; Cass, G. R.; Simoneit, B. R. T.; Rasmussen, R. A. (1998) Air Quality Model Evaluation Data for Organics. 5. C₆ - C₂₂ Non-Polar and Semi-Polar Aromatic Hydrocarbons. *Environ. Sci. & Technol.* **32**, 1760-1770.
- Fraser, M. P.; Cass, G. R.; Simoneit, B. R. T. (1998) Gas-Phase and Particle-Phase Organic Compounds Emitted from Motor Vehicle Traffic in a Los Angeles Roadway Tunnel. *Environ. Sci. & Technol.* **32**, 2051-2060.
- Simoneit, B. R. T.; Schauer, J. J.; Nolte, C. G.; Oros, D. R.; Elias, V. O.; Fraser, M. P.; Rogge, W. F.; Cass, G. R. (1999) Levoglucosan, a Tracer for Cellulose in Biomass Burning and Atmospheric Particles. *Atmos. Environ.* **33**, 173-182.
- Nolte, C. G.; Fraser, M. P.; Cass, G. R. (1999) Gas Phase C₂ - C₁₀ Organic Acids Concentrations in the Los Angeles Atmosphere. *Environ. Sci. & Technol.* **33**, 540-545.
- Fraser, M. P.; Cass, G. R.; Simoneit, B. R. T. (1999) Particulate Organic Compounds Emitted from Motor Vehicle Traffic and in the Urban Atmosphere. *Atmos. Environ.* **33**, 2715-2724.
- Schauer, J. J.; Fraser, M. P.; Cass, G. R.; Simoneit, B. R. T. (1999) Source Reconciliation of Atmospheric Gas-Phase and Particle-Phase Pollutants Using Organic Compounds as Tracers. Submitted for publication in *Atmos. Environ.*

Students

Stephen Friedfeld, Kalyan Lakshmanan, Mark Subick

Collaborators

D. Allen, D. Grosjean, B. R. T. Simoneit, R. Rasmussen

Advisor

Glen Cass (Cal Tech)