

6.088 PERSEUS: A SAMPLE PRECONCENTRATION AND GC/MS DETECTOR SYSTEM FOR ANALYSIS OF FLASK AIR SAMPLES FOR ATMOSPHERIC TRACE HALOCARBONS, HYDROCARBONS AND SULFUR-CONTAINING COMPOUNDS.

Presenting Author:

Benjamin R. Miller, Cooperative Institute for Research in Environmental Science (CIRES), University of Colorado, Boulder, 80309, USA,
ben.r.miller@noaa.gov

Co-Authors:

Doug Guenther, Cooperative Institute for Research in Environmental Science (CIRES), University of Colorado, Boulder, 80309, USA

Peter Salameh, Scripps Institution of Oceanography (SIO), University of California - San Diego, La Jolla, 92037, USA

Brad Hall, NOAA Earth System Research Laboratory (ESRL), Boulder, 80305, USA

Molly Crotwell, Cooperative Institute for Research in Environmental Science (CIRES), University of Colorado, Boulder, 80309, USA

Jim Kastengren, Cooperative Institute for Research in Environmental Science (CIRES), University of Colorado, Boulder, 80309, USA

Don David, Cooperative Institute for Research in Environmental Science (CIRES), University of Colorado, Boulder, 80309, USA

Pieter Tans, NOAA Earth System Research Laboratory (ESRL), Boulder, 80305, USA

Abstract:

A newly developed analyte preconcentration system for GC/MS expands the volatility range of the atmospheric halocarbons, hydrocarbons and sulfur-containing compounds measured in the long-term monitoring program of the Global Monitoring Division. Ethane (C₂H₆), tetrafluoromethane (CF₄), nitrogen trifluoride (NF₃), hexafluoroethane (C₂F₆), trifluoromethane (CHF₃), sulfuryl fluoride (SO₂F₂) and toluene (C₇H₈) are among the new additions to the 50+ greenhouse gases, ozone depleting substances and/or species of air quality involvement that are routinely measured in flask samples collected semi-daily at towers and semi-monthly in tropospheric altitude profiles with small aircraft across North America. Weekly flask samples collected at more remote 'clean air' sites globally serve as a background against which North American enhancements may be calculated. We describe here the technological development of this new analytical system, discuss its expanded capabilities and present example case studies from the first two years of atmospheric records.