



Cloud Chemistry Measurements during ICARTT 2004

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In-situ measurements of clouds were conducted out of Cleveland, Ohio from 21 July – 18 August 2004 to investigate the role of clouds in the transport and transformation of pollutants. This study was part of the ICARTT (International Consortium for Atmospheric Research on Transport and Transformation) 2004 field intensive. Measurements of trace gases (SO_2 , HNO_3 , NH_3 , H_2O_2 , O_3), particle size distribution and chemistry, and cloud microphysics were made from the National Research Council of Canada Convair 580 aircraft. The sampling of aerosol particles in clear air was done through an isokinetic diffuser, and cloud droplet residuals were sampled through a counterflow virtual impactor (CVI). A number of instruments were used to measure the physical size distribution of the aerosol. Aerosol chemistry was measured with an Aerosol Mass Spectrometer and with a Particle-In-Liquid Sampler coupled with two Ion Chromatographs (PILS-IC). Cloud droplet residuals were sampled with the AMS, a TSI 3022 Condensation Particle Counter and a TSI SMPS for size distribution. In addition, bulk samples of cloudwater were collected and analyzed with IC. Measurements were made below the bases and at various levels in towering cumulus. The results provide insights into the processing of nitrogen and organics by convective cloud.