FURTHER DEVELOPMENTS IN MATRIX ISOLATION SPECTROSCOPY FOR ANALYSIS OF TROPOSPHERIC CHEMISTRY SAMPLES

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Matrix Isolation Fourier Transform Infrared Spectroscopy (MIFTIR) is a promising technique for collection and analysis of atmospheric trace gases. The technique was originally applied for stratospheric samples, but we have recently begun analysis of tropospheric samples as well, and have obtained good sensitivity for several tropospheric species. In order to achieve this, it was found necessary to remove the large amounts of water from tropospheric air in order to obtain usable spectra: To this end several methods were evaluated including chemical drying (e.g. P_2O_5), commercial air dryers, as well as cryogenic traps. Cryogenic traps proved to be the most effective at removing humidity without affecting the sample. Successful recovery as well as analysis of data from two rural Canadian sites will be discussed. The analysis will focus primarily on the species N_2O, HCHO, the alcohols, as well as some of the chlorofluorocarbons (CFCs).