HYDROGEN AND NITROGEN BROADENED ETHANE AND PROPANE ABSORPTION CROSS SECTIONS

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High-resolution infrared absorption cross sections are presented for the ν_9 band of ethane (C_2H_6) at 823 cm^{-1}. These cross sections make use of spectra recorded at the Australian Synchrotron using a Fourier transform infrared spectrometer with maximum resolution of 0.00096 cm^{-1}. The spectra have been recorded at 150, 120 and 90 K for hydrogen and nitrogen broadened C_2H_6. They cover appropriate temperatures, pressures and broadening gases associated with the atmospheres of the Outer Planets and Titan, and will improve atmospheric retrievals. The THz/Far-IR beamline at the Australian Synchrotron is unique in combining a high-resolution Fourier transform spectrometer with an 'enclosive flow cooling' (EFC) cell designed to study molecules at low temperatures. The EFC cell is advantageous at temperatures for which the vapor pressure is very low, such as C_2H_6 at 90 K.

Hydrogen broadened absorption cross sections of propane between 700 and 1200 cm^{-1} will also be presented based on spectra obtained at the Canadian Light Source.