

# **Photoabsorption cross sections of organic molecules in the VUV at low temperatures : application to Titan's atmosphere observations.**

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To build photochemical models of planetary atmospheres and to interpret observations, the photoabsorption cross sections of molecules are needed. A critical review of the absorption coefficient available in the vacuum ultraviolet domain (VUV: 110-210 nm) for organic molecules present or expected to be present in Titan's atmosphere, showed a critical lack of data. In particular, many absorption cross sections have never been measured at low temperature. The lack is even greater for molecules not commercially available since, even at room temperature, absolute absorption coefficients are not available or erroneous. A new specific absorption cell has thus been designed to measure the absorption cross sections in the VUV range at low temperature characteristic of Titan's atmosphere. The first molecules that we have studied are HCN, HC3N and C4H2. We used the Berlin synchrotron facility (BESSY) to obtain those new absorption coefficients, including the first spectra in the 110 to 210 nm range, at the low temperature representative of Titan's atmosphere. The effect of the temperature on the spectra will be discussed. An application to the determination of photodissociation rate of those molecules will be shown. And, an application to the interpretation of VUV observations of Titan's atmosphere obtained by the UV spectrometer (UVIS) on board the CASSINI spacecraft, will be presented.