

EXCITATION OF ACETONE INDUCED BY ELECTRON IMPACT

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Abstract. Acetone $[(\text{CH}_3)_2\text{CO}]$ is the simplest ketone and it is one of the organic compounds that can be found in outer space. The detection of acetone in the interstellar space was first reported by Combes et al. [Combes et al., 1987], who detected this molecule in Sagittarius B2. It has also been detected in the mass spectra from 67P/Churyumov Gerasimenko, by the COSAC mass spectrometer at the comet's surface [Goesmann et al., 2015].

The emission spectrum following electron impact on acetone was studied in a crossed-beam experiment [Országh et al., 2017]. The spectrum was measured at several electron energies ranging from 7 to 102 eV within the wavelengths of 280 - 950 nm. The emission bands of CH (A-X), CH (B-X) and CH (C-X) along with emission lines of hydrogen's Balmer series were detected. Relative emission cross sections of identified transitions were measured at electron energy range within 7 – 102 eV. The experimental results are also complemented by theoretical calculations based on enthalpies of formation and excitation energies of detected fragments. The comparison of experimental and theoretical data can be used as a basis for suggesting dissociative excitation channels for selected transitions.

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