

High-resolution overtone spectroscopy of H_3O^+

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Abstract

The ro-vibrationally resolved measurement of the overtone region in the range of $6750\text{-}6950\text{ cm}^{-1}$ of the symmetric top molecule H_3O^+ was carried out at 120 K in a 22-pole ion trap using leak-out spectroscopy. A total of 85 lines were measured and compared with the calculations of Yurchenko et al. (2020), available in the ExoMol database, revealing their origin in the $2\nu_3$ overtone bands. The program pgopher will be used to fit the measured transitions to a Hamiltonian in order to obtain the molecular constants.