

THE HIGH RESOLUTION VIBRATION-ROTATION SPECTRUM OF SiH⁺

JOSE LUIS DOMENECH, *Molecular Physics, Instituto de Estructura de la Materia (IEM-CSIC), Madrid, Spain.*

Silicon bearing molecules account for $\sim 10\%$ of the identified molecules in space. Among those containing hydrogen, SiH and SiH₄ have been identified in the solar spectrum, in some cold stars, and SiH₄ in IRC+1026. However the simple SiH⁺ cation (silylidinium) has only been observed in the solar photosphere and it remains undetected in interstellar space. Most of the spectroscopic information on SiH⁺ comes from the analysis of its vis-UV spectrum^{a,b}, and from a diode laser spectrum combined with velocity modulation of the $v=1-0$ band^c. The latter contained just eight lines measured with an estimated accuracy of 0.001 cm^{-1} . We present the results obtained with a difference frequency laser spectrometer coupled to a hollow cathode discharge, with an increased number of lines and improved accuracy ($1 \times 10^{-4} \text{ cm}^{-1}$), allowing for an accurate prediction of the pure rotational transitions. These will be searched for in the Cologne Center for Terahertz Spectroscopy (CCTS). These data will be of use in future searches for this molecule in different astronomical environments.

^aA. E. Douglas & B. Lutz, *Can. J. Phys.* 48 (1970) 247

^bT. Carlson et al. *Astron. & Astrophys.* 83 (1980) 238

^cP. B. Davies, P. M. Martineau, *J. Chem. Phys.* 88 (1985) 485