459. Title:Millimeter-wave spectroscopy of titanium dioxide, TiO2
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Source title:Journal of Molecular Spectroscopy
Publication year:2011
Language:English
Document type:Article in Press
Abstract:The millimeter-wave rotational spectrum of TiO2 in its ground vibrational state has been recorded in the frequency range from 248 to 345 GHz using the Cologne Supersonic Jet Spectrometer for Terahertz Applications (SuJeSTA). Forty-two b-type rotational transitions of the main isotopologue 48TiO2 and five transitions of 46TiO2 in natural abundance have been measured up to J = 22 and Ka = 8 which corresponds to excitation temperatures of 170 K. TiO2 was formed by laser ablation and adiabatically cooled in a supersonic jet of helium to rotational temperatures of 20 K. The new transitions have been analyzed together with previously reported data obtained from Fourier-transform microwave spectroscopy in the frequency range from 7 to 42 GHz. The improved and extended set of spectroscopic parameters provides accurate transition frequencies for future astronomical searches in the millimeter-wave region.