

DOPPLER-FREE STUDY OF THE TiO MOLECULE

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We have studied the yellow-orange absorption spectrum of the TiO molecule by use of a Doppler-free spectroscopy experiment in which a cw tunable laser beam crosses an effusive beam of titanium monoxide. Thousands of wavenumbers belonging to the $B^3\Pi - X^3\Delta(1-0)$ and $c^1\Phi - a^1\Delta(0-0)$ bands have been measured to an accuracy of 10^{-3} cm^{-1} and interpreted in terms of molecular constants. For the first band^a, analysis of fine structure and Λ -doubling shows that the electronic structure of the $B^3\Pi$ state must be revisited. For the second band^b, electronic interactions with distant vibrational levels of the $c^3\Delta$ state must be considered to assign high rotational levels. Analysis of the spectra due to the five isotopes of titanium is on the tracks.

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^bC. Amiot, M. Cheikh, P. Luc and R. Vetter, *J. Mol. Spectroscopy*, 179,159 (1996).