PURE ROTATIONAL SPECTRUM OF TiCl\textsubscript{1} IN THE GROUND ELECTRONIC STATE

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Electronic spectra of TiCl\textsubscript{1} have been studied for years by various spectroscopic methods. However, it is still not clear whether the ground state of TiCl\textsubscript{1} is $^4\Phi_v$ which is assumed to be the case by the analogy of TiH and the results of ab initio calculations. In this study, we have detected pure rotational spectra of TiCl\textsubscript{1} for four spin components by using a submillimeter-wave spectrometer with a combination of frequency and discharge modulations at Ibaraki University. TiCl\textsubscript{1} is generated in a DC glow discharge of a gas mixture of TiCl\textsubscript{4}(\~{}1 mTorr) and Ar buffer(\~{}80 mTorr). Discharge current is 40 mA, and mainly the 440 GHz region is surveyed. We have obtained effective spectroscopic constants for all the spin-components for $v = 0$ that are consistent with the previous FT results. Our analysis will provide very accurate structural information on the ground electronic state of this radical.