ROTATIONAL SPECTROSCOPY OF MOLECULAR IONS USING A NOVEL DOUBLE RESONANCE APPROACH

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A novel method of rotational spectroscopy of trapped, cold molecular ions is presented. It is a double resonance scheme combining rotational excitation (in the mm-wave region) with rovibrational excitation (in the IR). The rovibrational excitation is detected by the recently developed leak-out spectroscopy (LOS) approach\textsuperscript{1,2}. LOS is based on the vibrational-translational energy transfer process occurring during the collision of the IR excited ion with a noble gas atom, after which the ion may escape the trap ("leak out") so that it can be counted by a detector. LOS and the rotational scheme based on it are very sensitive and generally applicable to any cation or anion. This poster presents rotational spectra for HC\textsubscript{3}O\textsuperscript{+}, c-C\textsubscript{3}H\textsubscript{2}D\textsuperscript{+} and H\textsubscript{2}CCCH\textsuperscript{+}.


\textsuperscript{2}see also talk of P. C. Schmid in Minisymposium "Spectroscopy of ions in traps"