

THRESHOLD PHOTODETACHMENT SPECTROSCOPY OF C_2^- IN A 16-POLE WIRE TRAP

SRUTHI PURUSHU MELATH, CHRISTINE LOCHMANN, MARKUS NÖTZOLD, ROBERT WILD, ROLAND WESTER, *Institute for Ion Physics and Applied Physics, University of Innsbruck, Innsbruck, Austria.*

Photodetachment spectroscopy is a powerful spectroscopic technique for determining the internal state distribution of a molecular anion. Previously, our group studied the threshold photodetachment spectroscopy of CN^- at both 16 Kelvin and 295 Kelvin in a 22-pole ion trap and measured the electron affinity of CN with great precision (EA: 3.864(2) eV)[1]. The dicarbon anion, our current molecule of interest, is a well-studied system due to its stable electronic level structure and potential laser cooling transition[2].

Here we present the threshold photodetachment spectroscopy study of C_2^- in a radiofrequency 16-pole ion trap at 8 Kelvin. We investigated the behaviour of the cross section near the threshold for the ground state transition, $C_2X^1\Sigma_g^+ \leftarrow C_2^-X^2\Sigma_g^+$. We see a p -wave behavior for this ground state detachment. And we measured the electron affinity, which is consistent with the previously measured values[3][4].

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