

Abstract Submitted
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Collisional Properties of Dipole-Bound Negative Ions¹ Y. LIU, M. CANNON, L. SUESS, F.B. DUNNING — A Penning ion trap is being used to study low-energy collisions between dipole-bound CH_3CN^- ions and a variety of attaching targets and polar molecules. In dipole bound negative ions the extra electron is weakly bound by the dipole potential of the neutral molecule in a diffuse orbital localized near the positive end of the dipole. In consequence, it is reasonable to expect that such species will be quite reactive. Charge transfer is observed in collisions with CH_3NO_2 and CS_2 leading to the formation of long-lived ($\tau \sim 1$ ms) CH_3NO_2^- and CS_2^- ions. Destruction is seen in collisions with polar targets as a result of rotational energy transfer. The measured reaction rates are large ($\sim 10^{-7} \text{ cm}^3 \text{ s}^{-1}$) and different reaction models are being explored. The data demonstrate the rich variety of processes that can occur in collisions involving dipole-bound anions.

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