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Fragmentation studies of CF^+ and HF^+ ions in collisions with cold electrons OLDRICH NOVOTNY, S. ALTEVOGT, M.H. BERG, D. BING, H. BUHR, H. FADIL, M. FROESE, J. HOFFMANN, B. JORDON-THADEN, C. KRANTZ, M. LANGE, M. LESTINSKY, M. MENDES, S. NOVOTNY, D.A. ORLOV, A. PETRIGNANI, A. SHORNIKOV, T. SORG, J. STUETZEL, A. WOLF, Max-Planck-Institut für Kernphysik, Saupfercheckweg 1, D-69117 Heidelberg, Germany, A.S. JAROSHEVICH, Institute of Semiconductor Physics, 630090 Novosibirsk, Russia — The fundamental molecules composed of atoms from the second row of the periodic table (C,N,O,F) have a rich structure of excited potential curves that can be probed at high energy resolution by observing fragmentation processes following collisions with quasi-monochromatic electrons. Experiments of this type are performed in merged electron and ion beams at the ion storage ring TSR in Heidelberg, Germany. Using a cold, photocathode-produced electron beam, experiments on the system CF^+ yield rich structure in the collision energy dependence of both dissociative recombination (DR) and excitation (DE). The fragment-imaging technique shows a strong collision energy dependence of final ground and excited states of DR products. Moreover, an angular anisotropy of DR is observed for elevated collision energies. DR of HF^+ displays extremely low kinetic energy release of neutral fragments yielding resolution on initial rotational states of the ions. This predestines HF^+ to be used as "molecular thermometer."

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