PHOTOION PRODUCTION OF HFH^+ FROM $(HF)_2$

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Total photoion yield and threshold production of HFH^+ from $(HF)_2$ has been studied by single photon VUV excitation. The VUV was scanned in the energy range from 15.9 to 14.6 eV. In this energy range there are two allowed channels producing HFH^+ ion: $(HF)_2 + h\nu \rightarrow HFH^+ + e^- + F$ and $(HF)_2 + h\nu \rightarrow HFH^+ + F^-$. The first channel was found to be the dominant one. Vibrational bands of HFH^+ ion ($\nu^+ = \nu_1 + \nu_2 + \nu_3$ up to 6) were assigned in the threshold photoionization spectrum, while clearly resolved sub-vibrational structures were also observed. The threshold of $(HF)_2(\nu'' = 0) + h\nu \rightarrow HFH^+(\nu^+ = 0) + e^- + F$ was determined to be $14.72 \pm 0.02\ eV$. Our data shows that the HFH^+ ion production is greatly enhanced by Rydberg resonances of $(HF)_2^*$, which act as the intermediate states in the production of HFH^+ ions.