

Hydrogen bonded molecular clusters: (HF)_n.

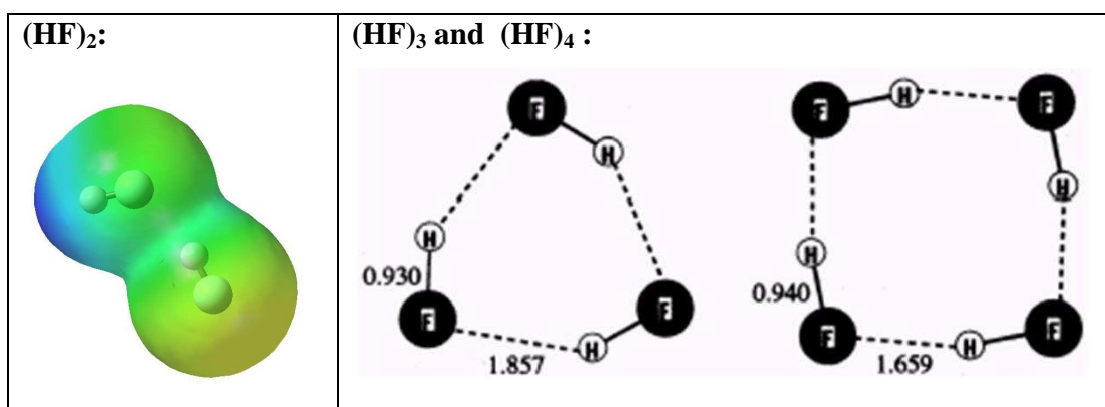
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Abstract.

Resonance-Enhanced-Multiphoton-Ionisation (REMPI) is a method which uses high intensity laser beams to ionize molecules or clusters after resonance enhanced excitation to neutral states. Clusters are formed by jet cooling. Ions are detected by Time-of-Flight (TOF) mass spectrometer. Molecular spectra are obtained by sampling ion yields as function of laser frequency (REMPI-TOF spectra).

Spectra obtained for HF gas for the wavenumber region 86000- 91000 cm⁻¹ were measured with the above method. Excited states of the HF clusters, formed during jet cooling, were observed for the first time. These states belong to the (HF)₂, (HF)₃, (HF)₄etc. –clusters of the HF molecule. A quantum mechanical simulation program was used to identify the (HF)₂ excited state whereas experimental observations proved the existence of excited states for larger clusters.



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