

Seminar

Infrared spectroscopy of molecular ions in helium droplets

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Molecular ions are important intermediates in the chemistry of condensed phase and upper atmosphere as well as in astrochemistry. Therefore, great strides were made in developing new techniques for spectroscopy of ions. The isolation of unstable chemical species such as ions and radicals in inert environments at cryogenic temperatures is a well-known technique to acquire the structural information of these ions. Here, we show that the electron impact ionisation of the helium droplets doped with molecules yields diverse molecular ions or ionic clusters embedded in the droplets of a few thousand *He* atoms. Infrared spectra are obtained using the release of the cations from the droplets upon laser excitation, followed by mass spectrometric detection. This experimental approach enables the study of a wide range of ionic molecular species. Some topics highlighted in this talk will include:

- Rotation of small molecular ions in *He* droplets
- Isomers of carbo-cations
- Structure of radical cation clusters
- Ion molecule reactions and protonation at low temperatures

Thursday, Nov 7th 2024

16:00 Hrs (Tea / Coffee 15:45 Hrs)

Seminar Hall, TIFR-H