# INFRARED SPECTROSCOPY OF JET–COOLED CATIONIC POLY–AROMATIC HYDROCARBONS: NAPHTHALENE$^+$

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Poly–Aromatic Hydrocarbons (PAHs) in their neutral and/or cationic forms have been proposed as the carriers of the Unidentified InfraRed bands (UIRs).[a] To understand the physical/chemical processes behind these UIRs the infrared (IR) absorption spectra of gas–phase ionized species under conditions similar to the interstellar environment are needed[b], however, to date almost none of these spectra are known.

Using the widely and continuously tunable 'Free Electron Laser for Infrared eXperiments' (FELIX) in Nieuwegein (NL)[c] in combination with a UV–laser–based spectrometer, we have obtained the IR absorption spectrum of the jet–cooled (naphthalene–Ar)$^+$ cluster–cation, via a similar triple–resonance UV/IR–experiment as recently has been demonstrated for aniline–Ar[d]. The weakly bonded Ar spectator atom is expected to affect the vibrations of the naphthalene chromophore only very little and therefore the IR spectrum observed directly reflects the spectrum of the bare naphthalene cation, which is also indicated by a calculated IR spectrum of the bare species.

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