

## IR-Spectrum of $\text{NC}_{4111} \text{NTf}_2$ in helium droplets

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ILs are organic salts with a melting point around RT. The combination of cations and anions result in a plethora of ILs which can be tailored to the specific applications such as cleaning processes, gas storage and batteries. Also mixtures and aqueous solutions of ILs are used in organic and inorganic synthesis. As they are ionic they possess a very low vapor pressure in general and are therefore non-combustible.[1]

Due to the low vapor pressure of ILs very few studies on dimerisation in the gas phase exist. Therefore we like to study the aggregation of ILs and the solvation of the same with water in helium nanodroplets via infrared depletion spectroscopy.

Helium nanodroplets provide very soft matrix for the IR-spectroscopy of single molecules and small clusters. Vapor pressures of only  $10^{-6}$  mbar are sufficient to incorporate molecules in the droplets. Through evaporative cooling the embedded molecules are then cooled to a temperature of 0.37 K which results in simplified IR-spectra.

We hereby present the first IR-spectrum of butyltrimethylammonium bis(trifluoromethylsulfonyl)imide  $\text{NC}_{4111} \text{NTf}_2$  in the region of 2800 to 3100  $\text{cm}^{-1}$ . Spectra were measured at different evaporation temperatures ranging from 200 to 240 °C.

[1] H. Weingärtner, *Angew. Chem. Int. Ed.* **2008**, 47, 654-670.