IR SPECTROSCOPY STUDY ON THE (HCl)$_n$(H$_2$O)$_m$ AGGREGATION IN HELIUM NANODROPLETS

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The study of acid-water clusters is an active area of research due to its fundamental importance for chemistry$^a,b$. In particular the (HCl)$_n$(H$_2$O)$_m$ clusters have been extensively investigated both theoretically and experimentally as a benchmark system. Despite of the great effort devoted to its understanding HCl dissociation in water clusters is still not well understood. An IR-Spectroscopy study on (HCl)$_n$(H$_2$O)$_m$ embedded in helium nanodroplets will be presented. The H$_{16}$O→H$_{18}$O and isotopic substitution was used in the experiments to probe the bands in the 2650-2760 cm$^{-1}$ spectral range which has been object of some debate recently$^c,d$. The observed isotopic shifts for the different bands raise some new questions to be addressed.

$^c$A. Gutberlet et al., Science 324, 1545 (2009).