IR SPECTROSCOPY STUDY ON THE $(HCl)_n(H_2O)_m$ 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 $(HCl)_n(H_2O)_m$ 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 $(HCl)_n(H_2O)_m$ embedded in helium nanodroplets will be presented. The $H_2^{16}O \rightarrow H_2^{18}O$ 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.

[a] D. Marx, Chem. Phys. Chem. 7, 1848, (2006).
[b] V. E. Bondybey *et al.*, Int. Rev. Phys. Chem. 21, 277 (2002).
[c] A. Gutberlet *et al.*, Science 324, 1545 (2009).
[d] S. D. Flynn *et al.*, Phys. Chem. Lett. 1, 2233 (2010).