

SOLVATION OF HCl, AGGREGATION OF H<sub>2</sub>O, HCl AND THEIR DEUTERATED ISOTOPES IN SUPERFLUID He DROPLETS<sup>a</sup>

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We investigate aggregates of HCl, H<sub>2</sub>O and their deuterated isotopes embedded in superfluid helium using a helium nanodroplet spectrometer combined with a cw infrared OPO set up with an output power of up to 2.7 W and a resolution of better than 0.001 cm<sup>-1</sup>. Depletion spectra of the super cooled aggregates (0.37 K) were recorded between 2650 cm<sup>-1</sup> and 2720 cm<sup>-1</sup>. We were able to assign the HCl stretch vibration of the HCl-H<sub>2</sub>O complex. We also observed spectral features of (HCl)<sub>m</sub>(H<sub>2</sub>O)<sub>n</sub> aggregates and isotopes in the region of the H<sub>3</sub>O<sup>+</sup> stretch vibration. The question of how many H<sub>2</sub>O molecules are needed to solvate HCl will be addressed.

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