MILLIMETER-WAVE SPECTROSCOPY OF H_2-HCl CLUSTER

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The pure rotational spectrum of the (p-H_2)- and (o-H_2)-HCl clusters for both ^{35}Cl and ^{37}Cl species have been recorded by using pulsed supersonic jet technique and millimeter-wave direct absorption spectroscopy in the 67-166 GHz region. These spectra were searched by using prediction based on the result of the infrared spectrum of the Cl-H stretching band. [a]
For (p-H_2)-HCl, two rotational transitions, $J = 3-2, 4-3$, in the Σ_0 ground state were obseved. For (o-H_2)-HCl, four rotational transitions split into l-type doubling, $J = 2-1 \sim 5-4$, in the Π_0 ground state were observed. All of spectra were split into hyperfine structure due to Cl nucleus. The intensity of (p-H_2)-HCl were approximately 1 / 20 that of (o-H_2)-HCl. The rotatonal constant, B_0, for the (p-H_2)-H^{35}Cl and (o-H_2)-H^{35}Cl were determined to be 16627.2089(20) and 16841.5120(54) MHz, respectively. The analysis of hyperfine structure and the search for rovibrational transions of the vdW bending mode are now in progress.

[a] D. T. Anderson *et al., Chem. Phys.* 239, 253-269 (1998)