INFRARED SPECTROSCOPY OF PROTONATED WATER-BENZENE CLUSTERS

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Mixed protonated clusters of water and benzene are created via arc discharge in a supersonic molecular beam cluster source. Infrared spectra are obtained via infrared photodissociation spectroscopy utilizing argon tagging. Infrared spectroscopy (1000 cm^{-1} to 4500 cm^{-1}) of these mixed clusters $H^{+}(H2O)_{x}(Bz)_{y}$(x=1,3, y=1-2) tagged with argon is employed to investigate the structures of these clusters, particularly with regards to the location of the proton. Studies as a function of cluster size investigate solvation of the proton. In the 1,1 cluster, a proton asymmetrically shared between the water and benzene is observed, with the proton closer to water even though benzene has the higher proton affinity. Clusters with multiple waters prefer to form protonated water clusters, with an attached neutral benzene.