INFRARED SPECTROSCOPY OF $(CH_3)_3N\text{-}H^+\text{-}(H_2O)_n$ (n = 1-22)

RYUNOSUKE SHISHIDO, ASUKA FUJII, *Department of Chemistry, Graduate School of Science, Tohoku University, Sendai 980-8578, Japan*; and KUO JER-LAI, *Institute of Atomic and Molecular Sciences Academia Sinica, Taipei, Taiwan*.

The magic number behavior of $H^+(H_2O)_{21}$ has been well known. Futhermore, this magic number is observed even in the mixed clusters $H^+(H_2O)_m(NH_3)_n$ and $H^+(H_2O)_m(MeOH)_n$ (m + n = 21). This means that NH_3 or MeOH molecules are compatible with water molecules in the hydrogen bond network of the magic number cluster.
In the present study, infrared spectroscopy is applied to $(CH_3)_3N\text{-}H^+\text{-}(H_2O)_n$ (n = 1-22), and structures of these clusters are determined with help of density functional theory calculations. As a result, it is demonstrated that no magic number is seen in the case of $(CH_3)_3N\text{-}H^+\text{-}(H_2O)_n$. $(CH_3)_3N$ is not a spectator to the hydrogen bond network of protonated water clusters, and it is largely changes the network structure.