

## Host-Guest Interactions in Zeolites Containing Choline Ions as a Guest Molecule

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Seven zeolites with different framework structures (i.e. UZM-4, UZM-22, offretite, levynite, chabazite, Y, and L) are synthesized using choline ions as a structure-directing agent. Elemental and thermal analyses,  $^1\text{H}$ ,  $^{13}\text{C}$  MAS and  $^1\text{H}$ - $^{13}\text{C}$  CP MAS NMR, and IR are employed to investigate the host-guest interactions in the as-made form of this series of zeolites. In particular, Analysis of the  $^1\text{H}$  MAS NMR spectra reveals that the weak OH peak of choline ion encapsulated in UZM-22 is more deshielded than those of the other zeolites, suggesting the existence of more strongly intramolecular hydrogen bonding character. This is consistent with the red-shift of IR O-H stretching region. It thus appears that the choline molecules occluded adopt distinct strength of hydrogen bonding within different zeolites structures. The strength of intramolecular hydrogen bonding in choline differs according to the structure of zeolites in which this OH group-containing molecule.