

Second Winner

Basic Research

Project Title

Syntheses and Characterizations,  
X-ray Crystal Structures, Solution  
Studies of Proton Transfer  
Compounds and Their Metal  
Complexes

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Abstract

In recent years our research group has studied proton transfer compounds and their complexes with different metal ions. We have already reported several proton transfer systems using 1,10-phenanthroline-2,9-dicarboxylic acid, pyridine-2,6-dicarboxylic acid, and 4-hydroxypyridine-2,6-dicarboxylic acid, as proton donor fragments, and 2,6-diaminopyridine, guanidine, creatinine, ethylenediguanidine, N,N'-diethyl-2-amino-6-methyl-4-pyrimidinol, and 1,10-phenanthroline as proton acceptor fragments. The next step of work was the study of metal-organic compounds obtained from the mentioned proton transfer systems. The compounds were characterized by elemental analyses, IR and NMR spectroscopy, single crystal X-ray diffraction and solution studies. The formations of proton transfer systems and their complexes in solution with stoichiometries very close to those of the solid state were strongly supported by the potentiometric pH titration studies. We also investigated the role of different non-covalent interactions such as ion-pairing,  $\pi$ - $\pi$  stacking and hydrogen bonding in formation of extended crystal networks. The study of these interactions is very important especially because of their significant role in stability of chemical and biological systems.