## Noncovalent Interactions in a Three Component Supramolecular Structure

<u>Kittipong Chainok</u><sup>a</sup>, Kenneth J. Haller<sup>a</sup>, Herman H.-Y. Sung<sup>b</sup>, Ian D. Williams<sup>b</sup>, <sup>a</sup>School of Chemistry, Institute of Science, Suranaree University of Technology, Nakhon Ratchasima 30000, Thailand. <sup>b</sup>Department of Chemistry, Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong, China. E-mail: kchainok10@yahoo.com

Preparation of  $[(ImH_2)^+]_2[Co(H_2O)_6]^{2+}[Co(TMA)_2(H_2O)_4]^{4-}$  by hydrothermal synthesis, and characterization by single crystal X-ray diffraction is reported. There are distinct cationic and anionic cobalt complex ions. The coordination environment of the cobalt atom in the cationic complex is essentially octahedral, formed by water molecules, while the coordination environment of the cobalt atom in the anionic complex, is distorted octahedral with four water molecules and two trans trianionic trimesate ligands. Two imidazolium monocations complete the structure and provide charge balance. The three moieties interact in the lattice through noncovalent attractions. The carboxylate groups are good hydrogen bond acceptors, while the solvate water molecules and imidazolium cations are good hydrogen bond donors. Thus, it is not surprising to find strong hydrogen bonds between the imidazolium N-H groups and the carboxylate oxygen atoms from the trimesate ligand. The N-H-O hydrogen bonds are in the range 2.693-2.777 Å, and the O-H…O hydrogen bonds are in the range 2.666-2.948 Å. The two imidazolium cations exhibit a pair of N-H··· $\pi$ hydrogen bonds ( $\pi$ - $\pi$  stacking) across an inversion center, and additional  $\pi$ - $\pi$  interactions to the trimesate ligands.

Crystal Data:  $P-1 \ a = 9.1175(9)$ , b = 9.3507(9), c = 10.6299(11)Å,  $\alpha = 79.224(2)$ ,  $\beta = 87.448(2)$ ,  $\gamma = 71.995(2)^\circ$ , V = 845.59(15) Å<sup>3</sup>; Z = 1; T = 298(2) K;  $R_I = 0.042$ , 2688 observed data.

Keywords: crystallography, noncovalent bonding, supramolecular structures