**07-Crystallography of Organometallic and Coordination Compounds**

addition, the alcoholic termini of PEGs provide sites for hydrogen bonding which has proven to be an interesting facet of this ligand's coordination chemistry. The supramolecular networks generated by hydrogen bonding to solvent molecules, anions, and other PEG ligands add to the intricacy of the observed structures.

This presentation will survey our structural results for PEG/metal complexes and reveal three primary coordination modes for PEG. Helical wrapping is most commonly observed for the hard oxophilic cations $\text{F}^-$, $\text{Li}^+$, the lanthanides, and group 1 and 2 cations, while a pseudo-planar template arrangement is commonly observed in $\text{Pt}^2$, $\text{Ag}^+$, and $\text{Cd}^2$ complexes. Out-of-cavity pseudo-cyclization closely resembling the $\text{Bi}^+$ crown ether coordination is prominent for the softer $\text{Bi}^+$, and has recently been observed in a single $\text{Cd}^2$ structure. We have primarily used chloride or nitrate salts in the preparation of these complexes and the influence of anion will also be discussed.

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**NEW CLATHRATE-TYPE STRUCTURES OF TETRALKYLAMMONIUM HALOGENIDE HYDRATES**

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Since the pioneer studies of Jeffrey et al. (cf. e.g. review in "Inclusion Compounds", vol. I, Acad. Press) a general structural pattern of clathrate type hydrates of tetralkylammonium fluorides is known as composed of anionic host framework incorporating fluoride ions in the water lattice of hydrogen bonds and tetralkylammonium cations occupying large cavities; the latter being formed by combining polyhedra typical for clathrate hydrates. It is assumed that if an alkylammonium ion does not fit the cavities which may be available, then no clathrate can be formed. This is not, in general, true, as recently demonstrated in phase pure present paper in which data of structural investigations performed on samples prepared by Dyadin's group are reported. In the present paper a series of hydrate structures having water framework structure gradually more and more distorted is given. The series begins with a cage-type structure in which square planar faces of water hydrogen-bonded polyhedra are observed (J. Lipkowski et al., JIPh, 9(1990),275). Next example represents somewhat more open structure in which guest cations (tetraethylammonium) are arranged along open channels in the water framework. By increasing the molar content of ammonium salt a layered structure was obtained between water molecules in preserved only partially (J. Lipkowski et al., JIPh, 13(1993),295). And, when going on to increase the clathrated amount of ammonium salt just two-dimensional pattern of the host is observed.

A variety of different structure types and stoichiometries (most part to relate the unpublished yet) will be demonstrated and an attempt to relate the clathrate hydrate structures to hydration patterns of some crown-peptide complexes will be illustrated.