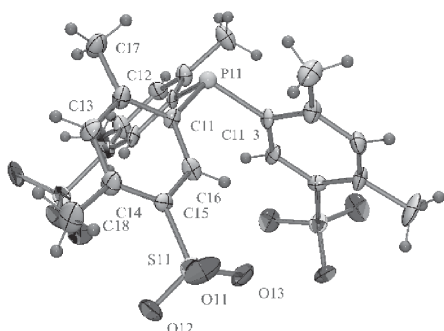


s13.m42.p5 **Hydrogen Bond Pattern in Guanidinium Salts of Sulfonated Phosphanes.** Attila Bényei^a, Henrik Gulyás^b, József Bakos^c and Ágnes Kathó^a, ^aInstitute of Physical Chemistry, University of Debrecen, Hungary, ^bResearch Group for Petrochemistry, Hungarian Academy of Sciences, Veszprém, Hungary, and ^cDepartment of Organic Chemistry, University of Veszprém, Hungary. E-mail: abenyei@delfin.klte.hu

Keywords: Hydrogen bond; Supramolecular assembly; Sulfonated phosphane

Sulfonated phosphanes are very important ligands in homogeneous catalytic hydrogenation or hydroformylation reactions performed in environmentally acceptable aqueous medium. We managed to determine the structure of several such compounds by forming their guanidinium salt[1]. However, their intensive hydrogen bond forming ability turned to be very interesting from supramolecular point of view, too. Sulfonated analogs of triphenylphosphane and their derivatives offer excellent possibility to compare and fine-tune H-bond, van der Waals and other secondary interactions depending on substituents and degree of sulfonation especially when their guanidinium salts are studied[2]. However, one of the most interesting compound[3] turned to be (tris(2,4-dimethyl-5-sulfonatophenyl)phosphane. This sterically very crowded phosphane crystallizes in trigonal space group and shows the internal C₃ molecular symmetry in the crystal structure, too.



Guanidinium counter ions occupy both general and special positions in the structure. Stacking interactions of phenyl rings result sixfold phenyl embraces. Strong electrostatic interaction of guanidinium chloride, which co-crystallizes, also influence the supramolecular structure. Comparison of hydrogen bond pattern in ortho- and meta-sulfonated triphenylphosphane and different sodium-guanidinium salt of trisulfonated triphenylphosphane serve as a versatile tool for crystal engineering and even understand catalytic properties of platinum metal complexes of these ligands and will be presented. Financial support from Hungarian Research Fund OTKA Grant No. T043365 and I. Széchenyi fellowship for A.C.B. and Á.K. is gratefully acknowledged.

- [1] Kathó, Á., Bényei, A. C., Joó, F & Sági, M. (2002). *Adv. Synth. Catal.* **344**, 278-282.
- [2] Holman, K.T., Pivovar, A.M., & Ward, M. D. (2001). *Science* **294**, 1907-1911 and references therein.
- [3] Gulyás, H., Bényei, A. C. & Bakos, J. (2004). *Inorg. Chim. Acta.*, in press.

s13.m42.p6 **Crystal Chemistry of Organic-Inorganic Hybrids : R_nPbX_m.** David G. Billing and Andreas Lemmerer, School of Chemistry, University of the Witwatersrand, Johannesburg, South Africa. E-mail: dave@aurum.wits.ac.za

Keywords: Crystal engineering; Supramolecular chemistry; Organic-inorganic hybrids

Investigations of organic-inorganic hybrid materials are of value not only because they form interesting supramolecular frameworks and/or unique polymorphic behaviour, but also because of their many and varied physical and chemical properties that could lead to technological innovations. Examples of properties that are frequently listed include interesting magnetic or ferroelectric transitions, thermal stability, electroluminescence, photoluminescence and conductivity (even super conductivity). For reviews see Papavassiliou (1997) and Mitzi (1999)

As part of a far larger investigation into the supramolecular chemistry of simple amine salts, we have determined the crystal structures of a fair number of haloplumbate ammonium salts that we would like to report on here. During the course of this study these compounds have demonstrated a propensity for forming a great variety of crystalline structures by self-assembling from suitable solution mixtures. The lead iodide octahedra can be connected in one of three ways: face-sharing between two equatorial and one axial halide, edge-sharing between two equatorial halides or corner-sharing through a single halide. It is also possible to have combinations of the various types of sharing in one chain. We have also observed interesting weak interactions such as hydrogen bonding and π - π interactions within the materials studies that we will highlight in the presentation.

In particular we would like to report the results for the amines depicted in the figure below.

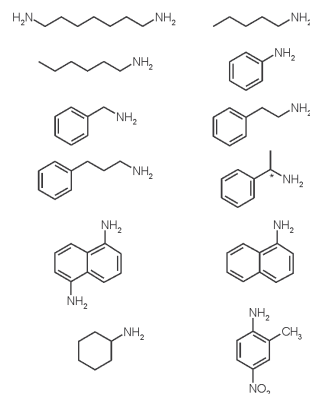


Fig. 1: Examples of amines used to form hybrid compounds.

- [1] Mitzi, D. B. (1999). *Prog. Inorg. Chem.* **48**, 1-121.
- [2] Papavassiliou, G. C. (1997). *Prog. Solid State Chem.* **25**, 125-270.