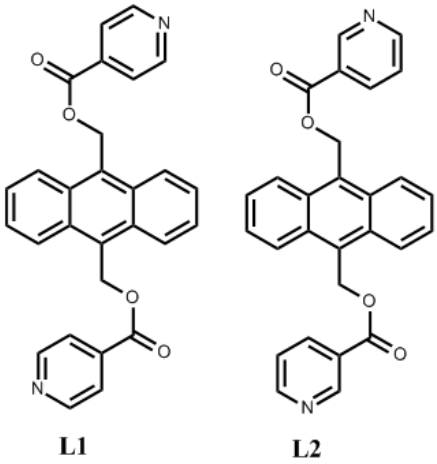

Figure 1. Ligands used for abtaining coordination polymers of Cu(II) and Zn(II). L1 = anthracene-9,10-diylbis(methylene) diisonicotinate; L2 = anthracene-9,10-diylbis(methylene) dinicotinate.

Keywords: Coordination polymers, antimicrobial properties, luminescence

MS33-P6 Giant Pentaphosphaferrocene-Based Supramolecules as Molecular Containers

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An inorganic analogue of ferrocene, pentaphosphaferrocene, $[Cp^RFe(\eta^5\text{-}P_5)]$ ($Cp^R = \eta^5\text{-}C_5R_5$, R = Me ($Cp^*$), CH_2Ph (Cp^{Bn}), PhC_4H_9 (Cp^{BIG})), is able to coordinate Cu^+ and Ag^+ cations resulting in either coordination polymers or in giant supramolecules [1-7]. The self-assembled supramolecules of 2.1 – 4.6 nm in diameter can be isolated in high yields using special crystallization technique. A tetrahedral coordination of Cu^+ together with the predetermined five-fold symmetry of the *cyclo*-P_5 ligand favors the formation of giant cages with fullerene [1,2] or fullerene-like [3, 4] topologies.

Pentaphosphaferrocene-based supramolecules can play a role of molecular containers (Figure 1). The central cavities can include matallocene and cage molecules, fullerene C_{60}, molecules of metastable compounds such as white phosphorous and yellow arsenic [6]. The ability of CuX to aggregation allows adapting supramolecule to encapsulate cationic guest molecules like Cp_2Co^+. Even more sophisticated supramolecules with multi-layered inorganic core built up with hundreds of metal, halogen and P atoms [5, 6] can be obtained, where external and internal cores are formed *via* σ- and π-coordination of the planar P_5-ring to copper, respectively.

Alternative way to influence the structure of the supramolecule is to use salts of copper(I) and silver(I) with larger anions. First results show that single-layered quasi-spherical supramolecules with large central cavity can be obtained by using of RSO_3^- anions that can coordinate three metal atoms with donor oxygen atoms. The resulting inorganic M-anion-$Cp^RFe(\eta^5\text{-}P_5)$ core resembles an icosidodecahedron, which is however essentially vacant in metal cation positions. The Cp^*-based supramolecules encapsulate $Cp^*Fe(\eta^5\text{-}P_5)$ molecules. Host-guest intermolecular interactions are discussed.

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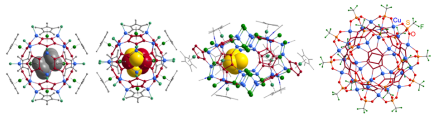

Figure 1. (left to right) Copper haide-based supramolecules encapsulating molecules of ferrocene, P_2S_2, and As_4. Inorganic core of a supramolecule based on copper triflate.

Keywords: giant supramolecule, pentaphosphaferrocene, inclusion compound, host-guest interaction, intermolecular interaction, single-crystal X-ray diffraction

MS33-P7 Small Angle Neutron Diffraction on the Vortex Lattice of Type II Superconductors

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In type II superconductors in magnetic fields $H_{c1}<H<H_{c2}$ the flux form a Vortex Lattice VL, whose geometry represents a delicate balance of the electronic Fermi surface features and pinning. This provides a very sensitive probe of some microscopic electronic properties which can be measured using small angle neutron scattering technique SANS. Below we describe selected results.

i) $YBa_2Cu_3O_{7-\delta}$ with δ=0, 0.15 at 2 K and for fields of up to 16 T applied parallel to the crystal c-axis, we observe in the SANS data (see Fig. 1) a sequence of field-driven and first-order transitions between different VL structures. By rotating the field away from the c-axis, we observe each structure transition to shift to either higher or lower field dependent on whether the field is rotated towards the [100] or [010] direction. We argue that these transitions are determined by the Fermi Surface Morphology [1].

(ii) KFe_2As_2, and related materials. We find an intrinsic anisotropy of the superconducting state in this material. With the SANS technique we monitor the vortex and find a field dependent anisotropy, indicating multiband superconductivity. These results support that KFe_2As_2 is Pauli limited for field applied in the basal plane.

iii) The flux-line lattice in CaAlSi has been studied by small-angle neutron scattering. A well-defined hexagonal flux-line lattice is seen just above Hc1 in an applied field of only 54 Oe. A 30_ reorientation of this vortex lattice has been observed in a very low field of 200 Oe. This reorientation transition is first-order and reflect nonlocal effects [3].

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