

## MS32-04 | PHOSPHORUS CAN DO MORE: P-P STACKING OF PLANAR AROMATIC P5-RINGS

Peresykina, Eugenia (University of Regensburg, Regensburg, GER); Virovets, Dr. Alexander (University of Regensburg, Regensburg, GER); Scheer, Prof. Dr. Manfred (University of Regensburg, Regensburg, GER)

The directed non-bonding interactions play an important role in modern supramolecular chemistry. Concerning phosphorus, so-called pnictogen bonding is usually mentioned in this context [1]. However, cyclic polyphosphorus ligands open new perspectives for the supramolecular chemistry. Since many years we have been using pentaphosphaferrocenes [ $\text{Cp}^{\text{R}}\text{Fe}(\eta^5\text{-P}_5)$ ] ( $\text{Cp}^{\text{R}} = \eta^5\text{-C}_5\text{R}_5$ , R=Me,  $\text{CH}_2\text{Ph}$ , etc.) as building blocks to obtain coordination polymers and giant supramolecules [2-5]. The X-ray diffraction studies proved that  $\text{cyclo-P}_5^-$  planar aromatic ligand of the pentaphosphaferrocene is capable of the  $\pi$ - $\pi$  stacking interactions with the other aromatic  $\pi$ -systems. The interplanar spacing of 3.5-3.8 Å, parallel arrangement of the aromatic fragments as well as  $^{31}\text{P}$  MAS-NMR data show the presence of intermolecular interaction. These interactions influence the orientation of the guest molecules in the central cavities of the supramolecules [2-4] and the crystal packing in the coordination polymers [5].

Financial support from the ERC grant ADG 339072 is gratefully acknowledged. The research was partly done at the light source PETRA III at DESY.

- [1] L. Brammer (2017) *Faraday Discuss.* **203**, 485.
- [2] E. Peresykina, et al (2016) *Structure and Bonding* **174**, 321.
- [3] E. Peresykina, et al (2018) *Chem.-A Eur. J.*, **24**, 2503.
- [4] H. Brake, et al (2019) *Chem. Sci.* **10**, 2940.
- [5] M. Elsayed Moussa, et al (2018) *Eur. J. Inorg. Chem.*, 2689.