2nd generation Hofmann-type networks – Introducing multifunctionality into spin-switchable frameworks

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Spin-switchable Hofmann-type Fe(II)-networks based on $M(CN)_4$ (M=Ni, Pd, Pt) as square planar building block and a ditopic N-heterocycle as *e.g.* pyrazine, 4,4'-bipyridine,… combine magnetism with host-guest chemistry.[1] A second generation of extended Hofmann-type networks was obtained by introduction of an acetylene-unit in the M-CN bond (figure 1), resulting in metallated tetrakis(cyanoacetylides) as expanded building blocks.[2] Thereby, not only was a notable increase in pore volume of about 120 % achieved, but the polarity of the PCP's inner surface could also be modified. For the growth of single-crystals a novel electrolytic crystallization approach was developed, providing the necessary Fe(II)-ions by anodic oxidation of Fe in a non-aqueous medium (figure 2). In the present contribution the second generation of bimetallic Fe-M, (M=Ni, Pd, Pt) Hofmann-type networks is presented and discussed with regard to its structural, magnetic and spectroscopic properties. A special emphasis is placed on the host-guest chemistry of the networks, as governed by the extended pores bearing alkyne-moieties.
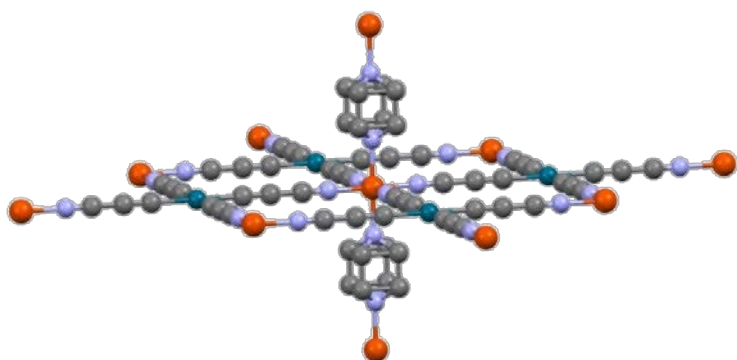

Figure 1 Extended Hofmann-type network ($[Fe(pz)(Pd(C_3N)_4)]$) with pyrazine (pz) as ditopic ligand

Figure 2 Electrolytic crystallization of the networks

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