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Supramolecular dimer of sandwich triple-decker phthalocyaninates studied by single-crystal x-ray diffraction analysis

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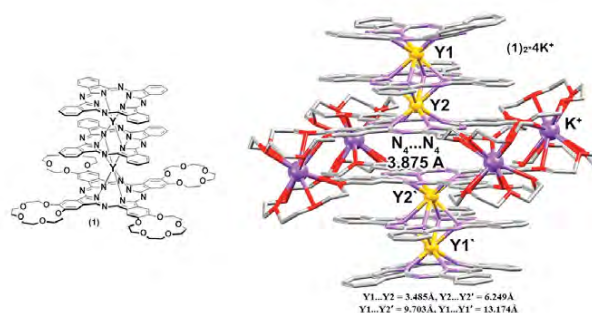
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Lanthanide phthalocyaninates with paramagnetic REE(III) ions reveal single-molecular magnetic (SMM) behaviour [1, 2]. The magnetic properties of usual double- or triple-decker sandwich complexes can be tuned by increasing the number of decks. Earlier in our group it was shown that triple-decker phthalocyaninates (1) with one terminal crown-substituted deck is capable for dimerization in solution in the presence of potassium ions [3]. In the present work we proved the formation of such sextuple-decker sandwich complex in solid state by single crystal XRD. The yttrium complex was chosen as diamagnetic reference for later investigations.

The solvates $(1)_2 \cdot (KBPh_4)_4 \cdot 4(CH_3CN) \cdot 7(CHCl_3)$ were obtained by slow diffusion of $KBPh_4$ in CH_3CN into the solution of (1) in $CHCl_3$ at 25 °C. The structural characteristics of the dimer suggest the possibility of the magnetic-dipolar f-f interaction between the ions at M1 and M2 sites, as well as additional weaker coupling between ions at M2 and M2' sites, which can be later observed in the case of isostructural complexes with Tb(III) and Dy(III).

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