

NEW CHIRAL MOLECULES FOR SELF-ASSEMBLY AT SURFACES

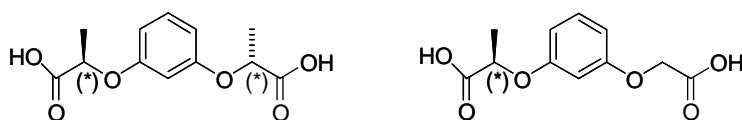
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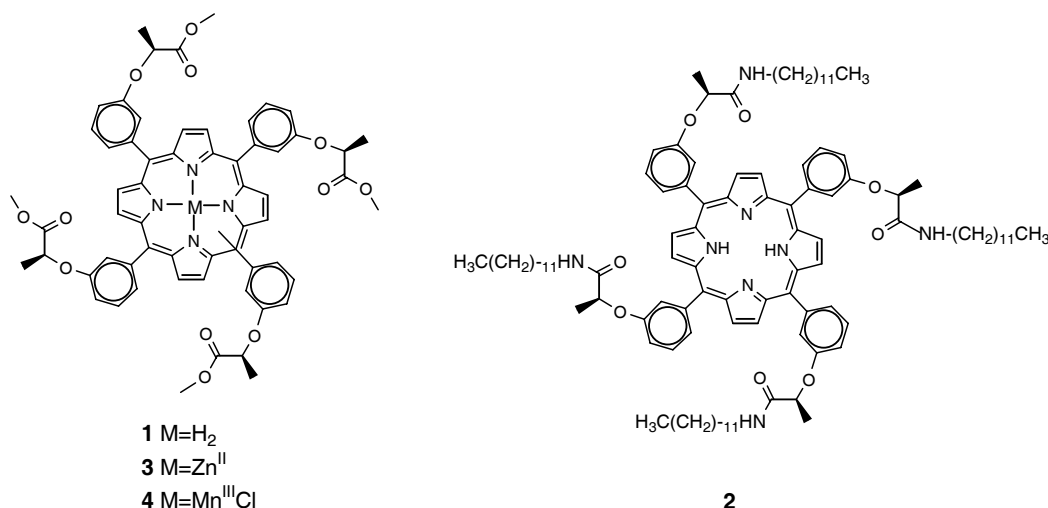
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In order to create chiral nanostructures is important to understand the interactions between molecules themselves and between molecules and surfaces, and explore the influence of chirality on the resulting nanostructure.

We are synthesising a series of compounds – based on resorcinol (1,3-dihydroxybenzene) to start with – which contain different number of stereogenic centres with different stereochemistries. The compounds will be taken as enantiomers and racemates to study their adsorption in different environments (metals and non-metals, both in high vacuum¹ and in solution²). In addition the solid state structures of the compounds will be sought to give support to the structural studies at surfaces.



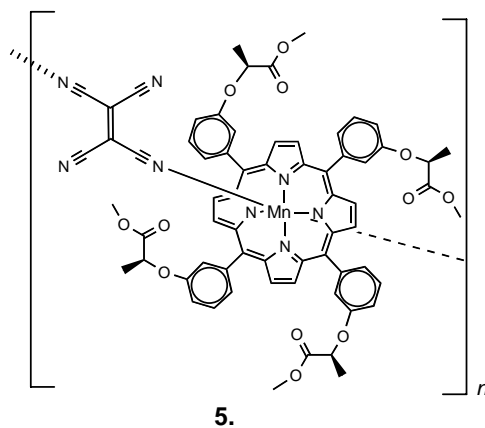
We additionally report the synthesis and characterization of enantiopure tetraphenyl porphyrins (TPPs) with a C_4 symmetry which could lead to new chiral space groups in two dimensions. Five different *meso*-tetraphenyl porphyrin derivatives have been prepared.



The free base TPP **1** could show interaction with a surface through the metal of the latter entering the macrocycle. The TPP amide **2** could self assemble generating an interesting molecular architecture whose driving forces are the establishment of hydrogen bonds between the amide groups and the π stacking interactions among the macrocycles. The Zn(II) TPP **3** is an interesting compound as a donor of electrons, it could be useful for the synthesise of

semiconductors. Axial ligands can be coordinated to the metal ion, leading to the formation of grafted surfaces where chirality is transferred perpendicularly away from the plane.

Due to the magnetic properties of Mn(III), this TPP derivative (**4**) could be considered for its potential application in new generation of magnetic systems. [MnTPP] [TCNE] **5** is the prototype of a growing family of linear chain (1-D) coordination polymers that magnetically order as ferrimagnets and show optical activity³.



This work is supported by the DGI (Project No. BQU 2003-00760), DGR, Catalonia (Project 2001SGR00362), and by the European Community Marie Curie Research Training Network CHEXTAN (MRTN-CT-2004-512161).

References

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