Hybrid systems based on dendritic macromolecules and iron oxide nanoparticles

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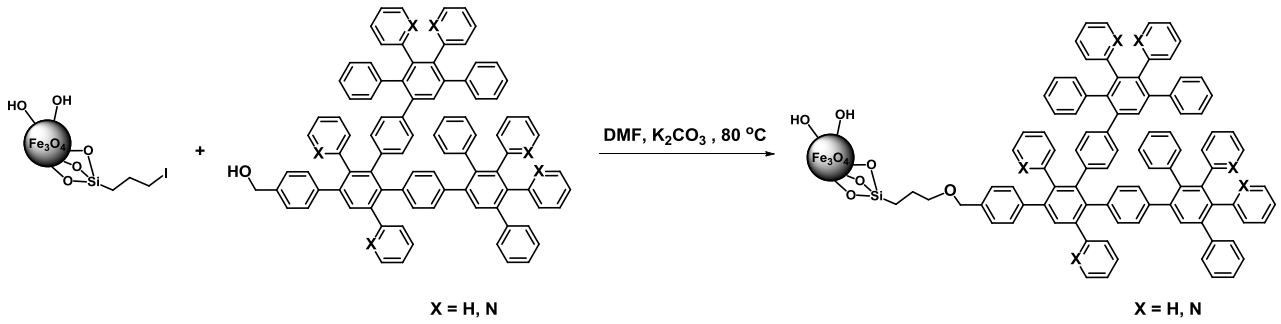
Magnetically separable catalysts have attracted considerable attention due to their easy separation from reaction mixtures and repeated use. This leads to more environmentally friendly processes, energy conservation and cheaper products [1, 2].

In this work the formation of hybrid systems based on functional dendritic ligands and magnetic silica is presented. Pyridylphenylene dendrons were synthesized using 4-ethynylbenzyl alcohol as the initial molecule providing the formation of the hydroxyl focal group of the future dendron. Synthesis of dendrons was carried out by Diels-Alder reaction.

Magnetite nanoparticles were formed and stabilized in the pores of silica gel by impregnation the iron salt ($Fe(NO_3)_3$) followed by thermal decomposition in the presence of a soft reducing agent. In the next stage, the synthesized dendritic molecules were grafted onto the surface of silica gel modified with 3-iodopropyltrimethoxysilane. The further reaction with $Pd(OAc)_2$ gives the hybrid catalyst. The morphology of the obtained magnetic composites was studied by transmission electron microscopy.



Scheme. *Formation of magnetic composite*

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2. Dong Wang, Christophe Deraedt, Jaime Ruiz, Didier Astruc. *Acc. Chem. Res.*, **2015**, *48 (7)*, 1871–1880.