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Synthesis, structure and properties of Ni and Co arylsulfonates

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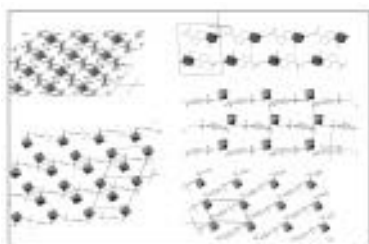
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Most of the transition metal sulfonates previously obtained from aqueous media are aqua-metal sulfonate salts [1]. The Rare Earth sulfonate materials [2] had been proved to be 3D polymers; they are chemically and thermally stable and appropriate for using in heterogeneous catalysis.

We report here the synthesis, crystal structure and catalytic properties of five new compounds of Nickel and Cobalt with 1,5- and 2,6-Naphthalenedisulfonate, four of them exhibiting a direct coordination of the metal atom with the sulfonate group. The materials have been hydrothermally synthesized in presence of o-phenantroline from aqueous media.

Geometrical features on the hydrogen-bond network topologies will be done.



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Supramolecular interactions in the 2-D coordination polymers: [M(btre)₂(NCS)₂] (M^{II} = Fe, Co)

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Bis-polydentate 1,2,4-triazoles are promising ligands for the synthesis of coordination polymers since molecular distortions associated to the spin state change of isolated Fe^{II} ions may be propagated through these bridging units. Self assembly of the new *btre* (1,2-bis(1,2,4-triazol-4-yl)ethane) ligand afforded [Cu₃(btre)₅(H₂O)₂](ClO₄)₆·H₂O, a coordination 3D polymer made of interconnected trinuclear Cu^{II} units.^[1] In the present work, the structural investigation of [M(btre)₂(NCS)₂] (M^{II} = Fe, Co) is reported and discussed in the light of the magnetic properties and ⁵⁷Fe Mössbauer investigation of [Fe(btre)₂(NCS)₂] (**1**). At 293 K, the crystal structure consists of a 2D sheet in which the M^{II} ions are linked by 1,2,4-triazole ligands in a N1,N1' bidentate coordination mode. The Fe-N bond lengths are ~ 2.22(3) Å indicating a HS state. The structure is stabilised by π bond interactions between two adjacent sheets and S...S interactions. The magnetic properties of (**1**) investigated over the temperature range (2 - 300 K) have revealed high-spin Fe^{II} ions, a situation confirmed by Mössbauer spectroscopy. Such a coordination network bearing supramolecular interactions with a MN₆ core was however designed to favour a cooperative spin crossover behaviour. [Fe(btre)₂(NCS)₂] could not be switched by any kind of trigger (temperature, pressure and light irradiation). Lattice effects must be considered.

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