coefficients as determined from variable temperature x-ray diffraction. Molecular dynamics is used to fully characterise ligand movement, and understand the extend to which framework flexibility determines mechanical behaviour.

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Keywords: metal-organic frameworks, flexibility, molecular dynamics

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Polymer dimensionality lead by supramolecular interactions in cobalt system

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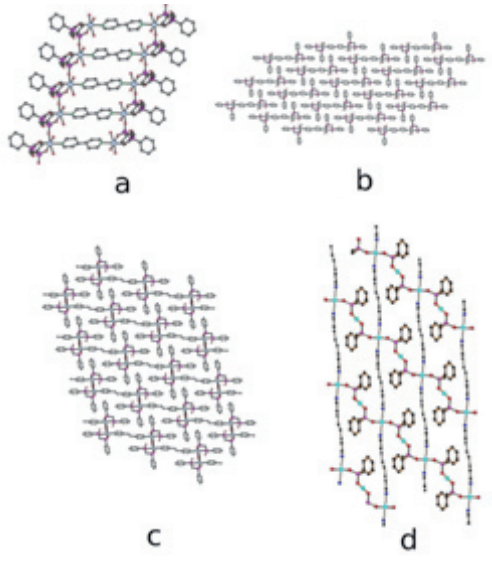
Supramolecular forces are involved in the building of the three-dimensional structure in the solid state [1]. Few years ago, it has shown that in metal inorganic organic hybrids the metal coordination environment can be forced by non-covalent interactions. The close packing of 2,2'-bipyridine ligands was responsible for the uncommon trigonal prismatic coordination of Mn(II). The *normal* octahedral Mn(II) coordination was restored when the intercalation of the bipyridine was prevented using substituted bipyridines [2].



We report here a series of hybrid inorganic organic polymers $[Co(pcp)(4,4'\text{-bipy})_{0.5}2H_2O]_n$ (**1**), $[Co(pcp)(bpye)_{0.5}H_2O]_n$ (**2**), $[Co(pcp)(bpyet)_{0.5}H_2O]_n$ (**3**) and $[Co(pcp)(bpyet)_{0.5}]_n$ (**4**) where pcp = P,P'-diphenyl-methylene-diphosphinato, 4,4'-bipy = 4,4'-bipyridine, bpye =1,2-bis(4-pyridyl)ethane, bpyet =1,2-bis(4-pyridyl)ethene).

In Figure 1 are shown 1D ribbon in **1** (a) and the packing view of **1** (b) and of **2** (c) parallel to the ribbon, finally the packing view of **4** (d).

In the 1D polymer of **1**, the ribbons of $[Co_2(pcp)_2bipy]$ are connected by hydrogen bonds (Figure 1a and 1b) while **2** and **3** are built by 2D plane formed by the same kind of 1D ribbons that are covalent bonded by water molecules. The view of the packing parallel to the ribbons shows the same type of arrangement of the phenyl rings of pcp and of the bi-pyridines. For **4**, a totally different 2D network was found with 1D columns of [Co(bpyet)] connected by square planar $Co(pcp)_2$ units (Figure 1d). The role of the bipyridine and its lenght in the formation of the network will be discussed.

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Keywords: metallorganic polymers, diphosphinate, supramolecular chemistry

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Inclusion Complex of β-Cyclodextrin and l-Menthol

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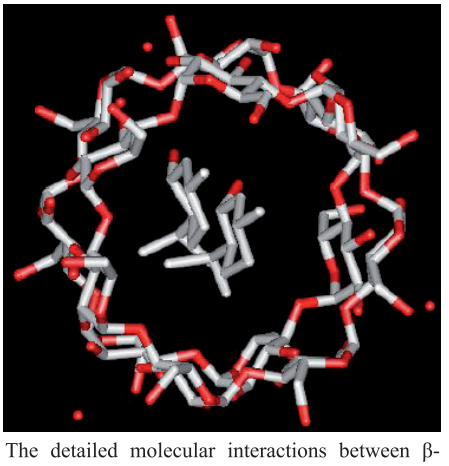
Cyclodextrins are the cyclic oligosaccharides composed of the glucopyranoses linked by α-1,4-glucoside bond. There are three common cyclodextrins with 6, 7 or 8 D-glucopyranosyl residues, α-, β- and γ-cyclodextrin respectively. Cyclodextrin has the truncated corn shape with hydrophilic OH substituents outside and hydrophobic cavity inside the molecule. The secondary alcohols (2-OH and 3-OH) make bigger and primary alcohols (6-OH) make smaller rims of truncated corn structure. Therefore, cyclodextrin can include the water insoluble molecules inside its cavity. This property is applied for various reagents to solubilize in water, stabilize from oxidation, recognize a molecule, or transfer a drug. Menthol has local anesthetic and counterirritant qualities, and it is widely used to relieve minor throat irritation. Menthol is included in many products such as toothpaste, chewing gum, cigarette etc. To keep the function of menthol, cyclodextrins are often included in these products. In order to understand the molecular function of cyclodextrin in these products, the crystal structure of β-cyclodextrin and l-menthol was determined by the X-ray diffraction method.

The inclusion complex of β-cyclodextrin and l-menthol crystallized in monoclinic space group $P2_1$ with cell parameters of a=15.2487(7), b=32.487(1), c=15.3835(5)Å, β=101.712(1)°, V=7462.2(5)Å^3, Z=2, F.W.=2582.52. Two β-cyclodextrins and two l-menthols are in the asymmetric unit. The X-ray diffraction data were collected on Rigaku RAPID diffractometer. The crystals include many crystalline waters and were very unstable in air. Thus, the data measurements were carried out at -150 deg. using flash cooling method. In total, 33,583 independent reflections were observed (R_{int}=0.0293). Crystal structure was solved by direct method (SHELXD) and refined by full-matrix least-squares on F^2 (SHELXL-97). The present R1 is 0.1100.



The detailed molecular interactions between β-cyclodextrin and l-menthol will be discussed.

The crystal structure is shown in the figure. Two