A novel porous metal-organic framework (MOF), Mn(btt)(HCOO)₉, was synthesized solvothermally in mixed H₂O/DMF. Single-crystal X-ray diffraction reveals it crystallizes in a hexagonal space group P6₃/m, with a = b = 11.7410(6) Å, c = 13.3199(13) Å, V = 1590.16(19) Å³, R1/wR2 = 0.0475/0.1030. Its structure is constructed by cross-linking Mn⁰ ions with 1,3,5-benzenetristetrazolates and formates, which formed in-situ from the hydrolysis of dimethylformamide, to form a 3D framework with parallel hexagonal tunnels. Although the Mn⁰ ions at 4f Wyckoff sites are 75% occupied, the framework remains robust and porous, with 264 m²/g BET surface area and hydrogen adsorption capacity of ~0.9 wt% at 77K and 1 atm.

In this work we report the synthesis and the structural studies of new Zn(II) metal organic frameworks. Thus, using p-amino benzoic acid (4-abaH) as organic linker and different ligands we have prepared the species {Zn(4-aba-H₂O)(L)}ₙ, [{Zn(4-aba)}₂], and [{Zn(4-aba-H₂O)}ₙ]. These compounds show a variation of their dimensionality ranging from 0 to 3, and present porous sizes between 4.116 Å and 6.93 Å. An additional interesting feature of these complexes is the multiple binding modes shown by the 4-aba connector, which acts as monodentate, bidentate or quelate ligand, even within the same complex.

Different experiments have been made intended to control different aspects of the coordination network. In this communication we analyze the effect of the monodentate coligands, the M:L ratio, the counterions and the pH in the coordination ways and topology of the species obtained.

Keywords: framework structures; metal-organic complexes; zinc compounds

The controllable preparation of porous metal-organic frameworks (MOF’s) is a desirable objective for many groups[1] since MOF’s have applications as materials for exchange, gas storage, catalysis, drug delivery, etc.[2]. Although many Zn(II) metal-organic framework have already been described, this metal continues to be in the centre of interest because of its ability to show different coordination modes and its magnetic and biological applications[3].