

Structural regulation of luminescent and magnetic properties of MOFs

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Two large series of metal organic frameworks (MOFs) were synthesised and structurally characterized. The first series represents anionic frameworks constructed from Zn²⁺ with 1,3,5-benzenetricarboxylate (BTC) anions and amino-cations. An influence of various cations such as NH₄⁺, MeNH₃⁺, Me₂NH₂⁺, Et₃NH⁺, and n-Bu₄N⁺ was characterized by the structural changes of the anionic Zn-BTC connectivity within the frameworks, and the fluorescence of the corresponding MOFs. The 13 Zn-BTC MOFs with 1, 2 and 3 dimensional structures were obtained and it was clearly demonstrated that cations are acting as structure directing agents. The second series represents MOFs based on the same cationic-anionic structure {Zn-BTC}{Me₂NH₂⁺} that was doped with different metals (Co, Cu, Ni, Mn, Ca, Mg and Gd). The X-ray diffraction studies did not reveal structural differences between doped materials, however their luminescent and magnetic properties were found to be different that might lead to their potential practical applications.

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