BOOK OF ABSTRACTS

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Effect of water addition on the formation of copper/zinc terephthalate MOFs

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The synthesis and study of metal-organic frameworks (MOFs) is one of the most extensively developed fields of modern coordination chemistry. Effect of pH, synthesis duration, temperature etc. on the formation and properties of MOFs is under consideration. Meanwhile far less attention is paid to a very important factor namely to the effect of solvent composition on the composition and structure of crystallizing compounds. To reveal this effect the study of solid phase formation in the systems $Cu(NO_3)_2$–1,4-BDC–amide–H_2O and $Zn(NO_3)_2$–1,4-BDC–amide–H_2O (amide–N,N-dimethylformamide, DMF or N,N-dimethylacetamide, DMA) was undertaken in the temperature range 90–180°C. As a result, the crystallization fields of distinct MOFs were determined. In copper-terephthalate systems with low water content $Cu_2(BDC)_2(amide)_2$ MOFs are formed at temperature up to 130°C, upon heating they gradually transform to $Cu(BDC)(NHMe_2)_2$. In water-rich solutions formation of copper basic terephthalate $(CuOH)_2(BDC)$ takes place.

In the zinc-terephthalate systems higher variety of compounds formed have been found that can be explained by high lability of complexes forming by ions with d^{10} configuration. Dimethylamide formed under acid-promoted hydrolysis of amide can both coordinate to zinc ion and serve as counter-ion in protonated $NH_2Me_2^+$ form.

The special attention will be paid to *anomal basicity of water* in DMF – H_2O systems effect that effect on both composition of MOFs and the conditions of their crystallization.

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