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Research paper

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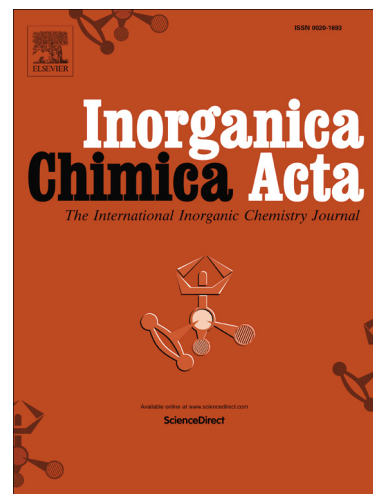
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THE INFLUENCE OF GREEN SYNTHESIS ON THE FORMATION OF VARIOUS  
COPPER BENZENE-1,3,5-TRICARBOXYLATE COMPOUNDS

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**Abstract**

Synthesis of metal organic framework (MOF), copper benzene-1,3,5-tricarboxylate was carried out at room temperature using water as solvent. Experimental results show that microporous  $\text{Cu}_3(\text{BTC})_2(\text{H}_2\text{O})_3 \cdot 10\text{H}_2\text{O}$  (**1**) or  $\text{Cu}_2(\text{OH})(\text{BTC})(\text{H}_2\text{O}) \cdot 2\text{H}_2\text{O}$  (**2**) (BTC= benzene-1,3,5-tricarboxylate) were formed depending on the rate of formation of MOF's in similar synthesis systems. The octahedral shape  $\text{Cu}_3(\text{BTC})_2(\text{H}_2\text{O})_3 \cdot 10\text{H}_2\text{O}$  (**1**) was formed when the crystallization occurred slowly while  $\text{Cu}_2(\text{OH})(\text{BTC})(\text{H}_2\text{O}) \cdot 2\text{H}_2\text{O}$  (**2**) which was produced when the crystallization occurred quickly has an extended rod shape feature. The samples were characterised under infrared spectroscopy, powder X-ray diffraction, scanning electron microscopy, thermogravimetric analysis and  $\text{N}_2$  adsorption desorption using the BET method. The  $\text{Cu}_3(\text{BTC})_2(\text{H}_2\text{O})_3 \cdot 10\text{H}_2\text{O}$  (**1**) shows a greater characteristic in terms of crystallinity, specific surface area, specific pore volume and adsorption capacity against methylene blue (MB) dye compared to  $\text{Cu}_2(\text{OH})(\text{BTC})(\text{H}_2\text{O}) \cdot 2\text{H}_2\text{O}$  (**2**).

**Keywords:** CuBTC, Metal Organic Framework, Adsorption, Methylene Blue, Morphology

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