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Effect of surface charge status of amorphous porous coordination polymer particles on the adsorption of organic dyes from an aqueous solution

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ABSTRACT

The surface charge status of coordination polymer particles (CPPs) from negative electrification through electrically neutral to positive electrification was achieved by varying the amount of acetic acid. The adsorption capacity of CPPs-1 with a negatively charged framework for the anionic dye Congo red (CR) is much higher than that of the CPPs-5, which possess a positively charged framework, because of different adsorption mechanisms. This is the first reported example of negatively charged CPPs exhibiting excellent adsorption performance toward anionic organic dyes. Broadly, the obtained results shed light on the mechanism of organic dye adsorption on CPPs. The CPP nanostructures exhibit excellent adsorption capabilities for the CR dye, with a maximum capacity of 1033.2 mg g⁻¹, which is higher than that of most reported materials. The influences of variables such as initial pH, organic dye concentration, and contact time were investigated. The results indicate that the

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