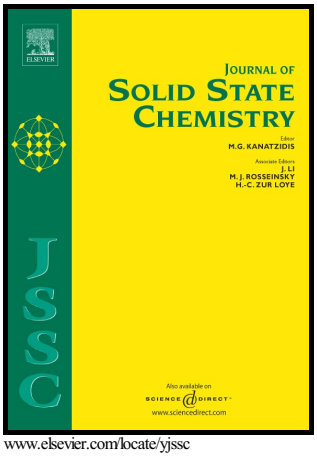

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Abstract

A novel highly efficient adsorbent-microporous tetranuclear Co(II)-based polymer, $\{[Co_4(L)_2(\mu_3\text{-}OH)_2(H_2O)_3(4,4'\text{-bipy})_2]\cdot(H_2O)_2\}_n$ (**1**, H_3L = 4-(N,N′-bis(4-carboxybenzyl)amino) benzenesulfonic acid, 4,4′-bipy = 4,4′-bipyridine), was hydrothermally synthesized. The complex **1** is a metal–organic framework (MOF) material which was characterized by single-crystal X-ray diffraction, BET and platon software. **Co-MOF** (complex **1**) reveals excellent adsorption property. The capacity of **Co-MOF** to remove arsenic As(V) from sodium arsenate aqueous solutions was investigated (The form of As(V) is AsO_4^{3-}). The experimental results showed that **Co-MOF** had a higher stable and relatively high As(V) removal rate (>98%) at pH 4–10. The adsorption kinetics followed a pseudo-second-order kinetic model, and the adsorption isotherm followed the Langmuir equation. **Co-MOF** exhibits a very high adsorption capacity of As(V) in aqueous solution (Q_{max} of 96.08 mg/g). Finally, the optimal adsorption conditions for the model were obtained through a Box–Behnken response surface experiment which