

Crystal Growth and Design 2016 vol.16 N9, pages 5084-5090

---

# Reversible Water-Induced Structural and Magnetic Transformations and Selective Water Adsorption Properties of Poly(manganese 1,1'-ferrocenediyl-bis-H-phosphinate))

Shekurov R., Miluykov V., Kataeva O., Krivolapov D., Sinyashin O., Gerasimova T., Katsyuba S., Kovalenko V., Krupskaya Y., Kataev V., Büchner B., Senkovska I., Kaskel S.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

---

## Abstract

© 2016 American Chemical Society. A flexible and hydrolytically stable metal-organic framework  $[Mn(H_2O)_2(Fc(PhOO)_2) \cdot 2H_2O]_n$  has been synthesized using ferrocene-based ligand bearing phosphinic groups ( $Fc(PhOOH)_2 = 1,1'$ -ferrocenediyl-bis(H-phosphinic acid)). In this compound manganese atoms are bound by phosphinate fragments to give infinite chains, and the latter are interconnected by ferrocene groups to form two-dimensional coordination polymer. The elimination of both coordinated and lattice water molecules during heating up to 150 °C produced the compound, which is nonporous for nitrogen, but can selectively adsorb water over methanol and other solvents at 298 K. The reversible structural transformation during adsorption/desorption of water is also reflected in a change of magnetic properties of the metal-organic framework.

<http://dx.doi.org/10.1021/acs.cgd.6b00681>

---