

Structurally diverse and phase transitions of manganese(III)-salen complexes

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Manganese(III)-salen complexes are subject of three research studies: (i) the design of models of Mn-containing proteins and enzymes, (ii) the development of catalysts for oxidations of organic substrates, and (iii) study of magnetism of Mn-complexes [1].

In this study, a series of formate-bridged manganese(III) complexes derived from Schiff based obtained by the condensation of salicylaldehyde, 5-bromo-salicylaldehyde, 5-chloro-salicylaldehyde, 3,5-dibromo-salicylaldehyde or 3,5-dichloro-salicylaldehyde and 1,2-diamineethane have been synthesized and characterized using single-crystal X-ray crystallography in the cases of [Mn(salen)(HCO₂)]_n (1), [Mn(5-Brsalen)(HCO₂)]_n (2), [Mn(5-Cl₂salen)(HCO₂)]_n (3), [Mn(3,5-Br₂salen)(HCO₂)]_n (4) and {[Mn(3,5-Cl₂salen)(HCO₂)]·MeOH}_n (5).

The crystal structures of [Mn(salen)(HCO₂)]_n (1) in variety temperatures show two phase transitions. The first phase transition shows also hysteresis. The change of mode coordination of formate bridge has been observed in the second phase transition.

[1] Miyasaka, H., Saitoh, A. & Abe, S. (2007). Coordination Chemistry Reviews, 251, 2622–2664.

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