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Mn₂(CO)₆(μ-mbi)₂ as a precursor for mono- and polynuclear complexes containing the 2-mercaptobenzimidazolate (mbi) ligand

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Abstract

The Me₃NO initiated reaction between Mn₂(CO)₁₀ and 2-mercaptobenzimidazole (mbiH) at room temperature leads to the formation of dinuclear Mn₂(CO)₆(μ-κ²-mbi)₂ (**1**) in which the metal atoms are linked by the sulfur atoms of the heterocyclic ligand. Complex **1** reacts with triphenylphosphine (PPh₃), bis(diphenylphosphino)methane (dppm) and 1,2-bis(diphenylphosphino)ethane (dppe) at room temperature to afford mononuclear Mn(CO)₃(PPh₃)(κ²-mbi) (**2**), Mn(CO)₃(κ²-dppm)(κ¹-mbi) (**3**) and Mn(CO)₃(κ²-dppe)(κ¹-mbi) (**4**), respectively, via metal-sulfur bond scission. Upon gentle heating, **1** also reacts with Os₃(CO)₁₀(NCMe)₂ and Ru₃(CO)₁₂ to yield the mixed-metal clusters MnOs₃(CO)₁₃(μ₃-κ²-mbi) (**5**) and MnRu₃(CO)₁₃(μ₃-κ²-mbi) (**6**), respectively, which contain a Mn(CO)₃(mbi) fragment. All these new complexes have been characterized by analytical and spectroscopic data, together with single crystal X-ray diffraction for **1**, **3**, **4** and **5**.

Keywords: Manganese complexes; Carbonyls; 2-Mercaptobenzimidazole; Mixed-metal clusters; X-ray structures.

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