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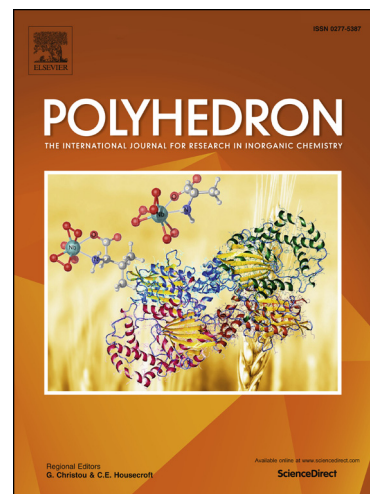
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## Selective Catalytic Oxidation of Alkenes Employing Homobinuclear Manganese(II) Catalysts with TBHP

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### Abstract

The two novel homobinuclear compounds  $[\text{Mn}_2^{(\text{II},\text{II})}(\mu_{1,1}\text{-4-CH}_3\text{-C}_6\text{H}_4\text{COO})_2(\text{phen})_4](\text{ClO}_4)_2$  (**1**) and  $[\text{Mn}_2^{(\text{II},\text{II})}(\mu_{1,3}\text{-4-CH}_3\text{-C}_6\text{H}_4\text{COO})_2(\text{bipy})_4](\text{ClO}_4)_2$  (**2**), where bipy = 2,2-bipyridine and phen = 1,10-phenanthroline, have been synthesized and characterized by elemental analyses and spectral methods (UV-vis, FTIR, and X-ray). A single-crystal X-ray diffraction structure analysis of the compounds revealed that the manganese atom is octahedrally coordinated. In compound **1**, the binuclear(II) structure is monodentate, bridged with one oxygen atom of carboxylate ligand in  $\mu_{1,1}$  mode, and each Mn(II) center is coordinated with two phen ligands. In compound **2**, the binuclear(II) structure is *syn-anti* bidentate, bridged with two oxygen atoms of carboxylate ligand in  $\mu_{1,3}$  mode, and each Mn(II) center is coordinated with two bipy ligands. The Mn–Mn separation is 3.441 (1) Å and 4.450 (1) Å for **1** and **2**, respectively. The catalytic potentials of these compounds have been tested for the oxidation reaction of various olefins (i.e., styrene, cyclohexene, ethyl benzene, 1-hexene, 1-octene). The oxidation reactions were carried out in the presence of catalytic amounts of **1** and **2** with a peroxide oxygen donor (TBHP=*tert*-Butyl hydroperoxide) in acetonitrile at 70°C. On comparing the catalytic activities of **1** and **2**, both catalysts showed good activity (~100% conv. in 24 h.) in the oxidation of studied alkenes, and excellent conversion was obtained for cyclohexene (~100% conv. in 3 h.; TON = 265 and TON = 257, respectively, for **1** and **2**).

**Keywords:** catalysis, manganese, oxidation, alkene

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