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Phloroglucinol and resorcinol based mononuclear dioxidomolybdenum(VI) complexes: Synthesis, structural characterization and catalytic epoxidation

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Abstract

Five mononuclear dioxidomolybdenum (VI) complexes of phloroglucinol and resorcinol derived ligands are reported. Two types of ligands are accessible through condensation of 2,4,6-trisacetyl-1,3,5-trihydroxybenzene (2,4,6-triacetylphloroglucinol) and benzoylhydrazide (H₂ptk-bhz, **I**) or 2-furoylhydrazide (H₂ptk-fah, **II**) and condensation of 4,6-diactylresorcinol and benzoylhydrazide (H₂dar-bhz, **III**), 2-furoylhydrazide (H₂dar-fah, **IV**) or nicotinoylhydrazide (H₂dar-nah, **V**). Mononuclear dioxidomolybdenum (VI) complexes of these ligands have been prepared. Isolated complexes, [Mo^{VI}O₂(ptk-bhz)(MeOH)] (**1**), [Mo^{VI}O₂(ptk-fah)(MeOH)] (**2**), [Mo^{VI}O₂(dar-bhz)(MeOH)] (**3**), [Mo^{VI}O₂(dar-fah)(MeOH)] (**4**) and [Mo^{VI}O₂(dar-nah)(MeOH)] (**5**) have been characterized by spectroscopic techniques like FT-IR, UV-Vis, ¹H NMR and single crystal X-ray diffraction (for complexes **1**, **3** and **5**) analysis. These complexes have been tested for the epoxidation of alkenes in the presence of 30% H₂O₂ and NaHCO₃ where latter one acts as an additive. Under optimized reaction conditions, a good conversion of alkenes along with their selective epoxidation and high turnover number was achieved.

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