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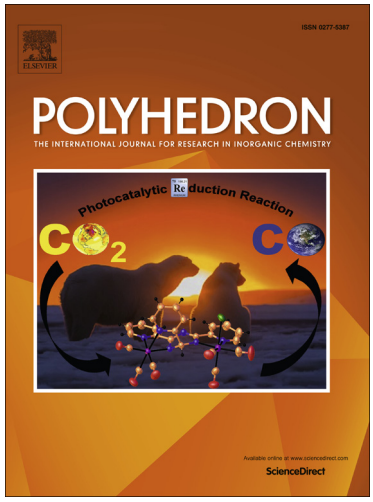

Synthesis, characterization and catalytic oxidation property of copper(I) complexes containing monodentate acylthiourea ligands and triphenylphosphine

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Synthesis, characterization and catalytic oxidation property of copper(I) complexes containing monodentate acylthiourea ligands and triphenylphosphine

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ABSTRACT

The reactions between $[CuCl_2(PPh_3)_2]$ and 3,3-diphenyl-1-(2,4-dichlorobenzoyl)thiourea (HL1), 3,3-diisobutyl-1-(2,4-dichlorobenzoyl)thiourea (HL2) or 3,3-diethyl-1-(2,4-dichlorobenzoyl)thiourea (HL3) in benzene gave new four-coordinated tetrahedral copper(I) complexes of the type $[CuCl(HL)(PPh_3)_2]$ (**1–3**) [HL = 3,3-dialkyl/aryl-1-(2,4-dichlorobenzoyl)thiourea derivatives]. These complexes were then characterized by analytical and spectroscopic (IR, UV/Vis, ^1H, ^{13}C and ^{31}P NMR) techniques. The molecular structure of a representative complex, $[CuCl(HL1)(PPh_3)_2]$ (**1**), was determined by the single crystal X-ray diffraction method which reveals a distorted tetrahedral geometry around the Cu(I) ion. The complexes **1-3** (0.007 mmol) were found to be active catalysts for the oxidation of primary and secondary alcohols (5 mmol) to their corresponding acids and ketones, respectively, in the presence of hydrogen peroxide (6.0 mmol) in 1-butyl-3-methylimidazolium hexafluorophosphate {[bmim][PF_6]} (0.1 mL) without any additive and base, at 70 °C.

Keywords: Copper(I), Thiourea derivatives, Catalytic oxidation, H_2O_2, Ionic liquids

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