A reusable CuII based metal-organic framework as a catalyst for the oxidation of olefins

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The metal-organic framework [Cu2(bipy)2(btec)] ? was used as a heterogeneous catalyst in the liquid phase oxidation of styrene and cyclohexene with tert-butylhydroperoxide (TBHP) as the oxidant either in water-dichloroethane or n-decane medium. Four catalytic systems were tested and compared after 6 hours of reaction. The oxidation of styrene using [Cu2(bipy)2(btec)]? showed a competitive conversion, as compared with some CuII heterogeneous catalysts and MOF catalysts. Conversion between 61-45% in dichloroethane:TBHP: water at 75 °C was obtained, using molar ratios of substrate:catalyst from 200 to 2400. When the solvent was replaced by n-decane, the conversion remained similar, that is, between 57-46%, at the same mole ratio range of substrate:catalyst. Styrene oxidation in dichloroethane:TBHP:water [Cu 2(bipy)2(btec)]? is not selective; the products are benzaldehyde, styrene epoxide and 1-phenylacetaldehyde in 37%, 35% and 29% yields, respectively. The oxidation of cyclohexene showed