

Synthesis And Catalytic Activity of Polymer Supported Schiff Base Complexes of Cu(II) and Iron(III) Ions in Comparison to Unsupported Complexes.

K. C. GUPTA and H. K. ABDULKADIR

Abstract

The polymer supported metal complexes of N,N'-bis(acetyl acetone)-o-phenylenediamine (ACPDA) Schiff base were synthesized by suspension copolymerization of styrene and allyl chloride in the presence of divinyl benzene (DVB) as cross-linker and azobisisobutyronitrile (AIBN) as initiator at 70±0.18°C and then ACPDA Schiff base and metal ions were loaded on the resulting polymer beads. The crosslinked density in polymer beads was varied by taking different concentrations of divinyl benzene in the reaction mixture. The polymer beads were characterized for their cross-linked density, size (f), density (r), degree of swelling (%Sw) and loading of ACPDA Schiff base and metal ions. The polymer beads prepared with 1.5 mmol of DVB (Type III) had a sufficient amount of allyl chloride (4.90 mmol, 0.367 g) and showed optimum loading for ACPDA Schiff base (1.96 mmol/g) and metal ions. The structures of copper (II) and iron (III) ions complexes (ACPDA-M) and their loading on polymer beads (P-ACPDA-M) was characterized with spectral analysis. The catalytic activity of unsupported and polymer supported ACPDA Schiff base complexes of copper (II) and iron (III) ions was evaluated by studying the rate of decomposition of hydrogen peroxide. The rate of decomposition (R_p) of hydrogen peroxide varied linearly with a concentration of hydrogen peroxide and catalyst, but varied inversely with hydrogen ions concentration. Finally reaction steps for decomposition of H_2O_2 were proposed and a rate expression was derived considering the experimental data.