

Faculty of Science

Department: Chemistry

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Title: Study of oxidation of 2-aminophenol by molecular oxygen catalyzed by cobalt(II) phthalocyaninetetrasodiumsulfonate in water

Authors: M. Hassanein; M. Abdo ; S. Gerges & S.El Khalafy

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Abstract:

The oxidation reaction of 2-aminophenol with dioxygen to 2-amino-phenoxazin-3-one has been investigated in water using cobalt(II) phthalocyaninetetrasodiumsulfonate as catalyst. The oxidation reaction was followed by measuring dioxygen uptake. Cobalt(II) phthalocyaninetetrasodiumsulfonate has been found to enhance the rate of oxidation of 2-aminophenol to 2-amino-phenoxazin-3-one. The starts of oxidation reaction showed linear dependence on catalyst concentration and saturation kinetics in both 2-aminophenol concentration and dioxygen pressure. A mechanism has been suggested for the oxidation reaction

Key words:

2-aminophenol; 2-amino-phenoxazin-3-one; oxidation, dioxygen, cobalt phthalocyanine

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Title: Autoxidation of 2,6-di-tert-butylphenol catalyzed by 5,10,15,20-tetrakis [4-(diethylmethylammonio)phenyl] porphyrinatocobalt(II) tetraiodide in water

Authors: MHassanein, S.Gerges; M. Abdo, & S. El Khalafy

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Abstract:

The cationic cobalt(II) porphyrin complex: 5,10,15,20-tetrakis [4-(diethylmethylammonio) phenyl] porphyrinatocobalt(II) tetraiodide has been found to be an efficient catalyst for the oxidation of 2,6-di-tert-butylphenol by dioxygen in aqueous medium. The oxidation reaction afforded mainly the corresponding diophenoquinone and some of the 2,6-di-tert-butyl-1,4-benzoquinone. The initial rate constant of autoxidation reaction was found to increase with increasing pH from 7.0 to 10.0 . The rate of autoxidation reaction showed linear dependence on catalyst concentration and dioxygen pressure. The rate of autoxidation reaction was found to fit a Michealis-Menten kinetic model for saturation of catalyst sites with increasing 2,6-di-tert-butylphenol concentration. The catalyst showed reduced activity in repeat oxidation reactions

Key words:

Cationic cobalt(II) porphyrin complex, oxidation of 2,6-di-tert-butylphenol, catalysis.