

INVERSE SPINEL NICKEL FERRITE AS THE ANODE MATERIAL FOR ELECTROCHEMICAL OXIDATION OF PHENOL

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ABSTRACT

Environmental pollution has become a major issue due to rapid industrialization and urbanization. Over the years, organic and inorganic chemical products are produced in voluminous quantities from the domestic and industrial processes. Among the organic pollutants aromatic, chlorinated hydrocarbons and pesticides are considered among most toxic compounds. They are relatively resistant to biodegradation due to strong organic bonds. The present study focuses on the possibility of using nickel ferrite as the anode, for the oxidation of phenol in alkaline medium. The electro oxidation and degradation of phenol had been investigated by cyclic voltammetry technique. Phenol can be oxidized on ferrite electrodes giving rise to benzoquinone and aliphatic organic acid. On further oxidation, the intermediate products can completely oxidized to CO₂, which is a less toxic gaseous product compared to phenol. From the study, it is concluded that the inverse spinel nickel ferrite compound is found to work as an effective anode material, which can oxidize phenol into non-toxic components like carbon dioxide and water. The treated end products are environment friendly gas and liquid which can be acceptable to the environmental consideration.

KEYWORDS: Phenol, Environmental Pollution, Nickel Ferrite Anode, Electro Oxidation