Electrochemical Hydrogenation of Alpha Methyl Styrene to Cumene

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A new hydrogenation process for atmospheric pressure conversion of alpha methyl styrene (AMS) to cumene is described. Formate ion is provided as a proton transfer agent in the reaction which involves AMS and water in the presence of a palladium catalyst. The bicarbonate ion, a product of the reaction is continuously reduced at the cathode of an electrochemical reactor to regenerate the formate. The influence of the emulsifying agent, formate concentration, applied potential and current density, the solution pH and temperature on the rate of AMS conversion is determined. Up to 96% AMS conversion was obtained at 60 °C.

Keywords: mediated electrochemical reduction, alpha methylstyrene, cumene, bicarbonate-formate redox

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