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## DECOLORIZATION OF CHLOROLIGNIN WITH HYDROGEN PEROXIDE IN THE PRESENCE OF SILICA [BIS(DIBENZOYLMETHIDO) COPPER II] AS CATALYST

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### Abstract

This paper reports an improved chlorolignin (CL) oxidative decolorization in alkaline media by the use of a heterogeneous system consisting of hydrogen peroxide and a silica [bis(dibenzoylmethido) copper II] (S1) catalyst. The catalytic functions of S1 in the presence of H<sub>2</sub>O<sub>2</sub> were evaluated by comparing the chlorolignin decolorization in media with and without addition of catalyst. Since decolorization is associated with CL degradation, the pH variation and chloride release assays were carried out to monitor both processes. The influence of several factors such as H<sub>2</sub>O<sub>2</sub> and chlorolignin concentration, initial pH, reaction time, temperature, and catalyst dose were assessed to improve the catalytic reactions. Also, the stability and potential reusability of the catalyst were studied. It was found that the oxidative reaction follows pseudo-first order kinetics with respect to chlorolignin concentration. Activation energy, as well as activation enthalpy and entropy, were calculated using the Arrhenius and Eyring equations, respectively.

*Keywords:* chlorolignin, Cu (II) catalyst, decolorization, hydrogen peroxide, oxidative degradation

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