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## REMOVAL OF BIOPOLYMERS IN DISTILLERY SPENTWASH USING IRIIDIUM OXIDE COATED TITANIUM MESH ANODE AND POLYALUMINUM CHLORIDE: OPTIMIZATION AND SEQUENTIAL STUDIES

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### Abstract

The purpose of the undertaken research work is to degrade the biopolymeric pigments present in the distillery spentwash. This is done by direct electro-oxidation using iridium oxide coated titanium mesh as catalytic anode. The effects of current intensity, dilution, pH and time of electro-oxidation were studied. The combined effects were analyzed using Box-Behnken design for optimization and statistical analysis. The rate constant for first order electrochemical kinetics relating the rate constant and current density for decolorization is proposed as  $k_r = 0.00109 (I_d)^{1.7244}$ . The power consumption at different current intensities was found based on chemical oxygen demand reduction. The optimal parameters obtained were current intensity (1.3A), dilution (10%) and electrolysis time of 3 hours for 90% target color removal. The actual color removal at optimal conditions is 88% color removal, which confirms close to statistical analysis. The sequential treatment with polyaluminum chloride coagulant was studied to develop an optimized solution for complete degradation of biopolymers.

*Key words:* biopolymeric pigments, Box-Behnken design, coated titanium, distillery spentwash, iridium oxide, mesh catalytic anode, poly aluminum chloride

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