

## Unraveling Biostimulation of Decolorized Mediators for Microbial Fuel Cell-Aided Textile Dye Decontamination

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**Abstract :** This first-attempt study revealed that decolorized intermediates of azo dyes could act as redox mediators to assist wastewater (WW) decolorization due to enhancement of electron-transport phenomena. Electrochemical impedance spectra indicated that hydroxyl and amino-substituent(s) were functional group(s) as redox-mediator(s). As azo dyes are usually multiple benzene rings structured, their derived decolorized intermediates are likely to play roles of electron shuttles due to lower barrier of energy gap for electron shuttling. According to cyclic voltammetric profiles, redox-mediating characteristics of decolorized intermediates of azo dyes (e.g., RBU171, RR198, RR141, and RBK5) were clearly disclosed. With supplementation of biodecolorized metabolites of RR141 and 198, decolorization performance of could be evidently augmented. This study also suggested the optimal modes of microbial fuel cell (MFC)-assisted WW decolorization would be plug-flow or batch mode of operation with no mix. Single chamber-MFCs would be more favourable than double chamber MFCs due to non-mixing contacting reactor scheme for operation.

**Keywords :** redox mediators, dye decolorization, bioelectricity generation, microbial fuel cells

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