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7H[WLOH G\H ELRVRUSWLRQ RQWR GULHG DONDOL WUHDWHG VXQIORZHU VHHG KXOO IRU UHPRYDO RI WH[WLOH G\H IURP DTXHRXV VROXWLRQV WKHUPRG\QDPLF VWXGLHV DQG EDWFK DGVRUEHU GHVLJQ

*EHNHORORXZD % 2JXQWLPHLQ
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Dyes containing e uents from textile and food industries cause serious environmental problems that can be mutagenic or carcinogenic and require pretreatment for color removal prior to disposal into aqueous systems. Treatment technologies like coagulation and occulation reverse osmosis, photo degradation membrane separation; biodegradation, ion exchange, and adsorption are most o en used for the treatment of dye containing wastewater. Among these methods, adsorption is simple and requires low maintenance and is the most widely used single method for the removal of dyes from aqueous solutions and e uent. is paper address the application of alkali treated dried sun ower seed hull (DSSH), a low cost material for the removal of textile dye from industrial wastewater e uent. Batch adsorption studies were performed as a function of contact time, initial solution pH, initial dye concentration and temperature. e optimum initial solution pH was found to be pH 2.2. Kinetic analysis revealed that adsorption experimental data was best tted by pseudo-second order model at all textile dye concentration tested. Based on the rate constants obtained by this kinetic model using Arrhenius and Eyring equations the activation parameters were determined, namely the activation energy (8.79 kJ/ mol), the change of entropy (^{8}(-1.73 x 10 k J/ mol/ K), enthalpy (-6.20 kJ/ mol), and Gibbs free energy (range 5.06 x 10^{-16} x 7.70 x 10^{-19} kJ/ mol) for the formation of activated complex between Textile dye molecules and dried sun ower seed hull. e equilibrium adsorption data was found to follow the Langmuir isotherm model and maximum monolayer capacity was found to be 169.5 mg/g at 25^{15}C. e Langmuir isotherm model was applied to the design of a single –stage absorber. ermodynamics of dye adsorption revealed the process was spontaneous and exothermic in nature. e magnitude of enthalpy change (H) was found to be 8.79 kJ/mol, indicating that physical forces were involved in adsorption of dye onto DSSH. is study revealed that DSSH a waste material may be a suitable adsorbent for decolorization of industrial ef uents due to its low cost and high adsorption capacity.

Biography

Gbekeloluwa B Oguntimein joined the MSU faculty in February 1997. He has more than 35 years experience in teaching, research, and administration in environmental engineering, biochemical engineering, chemical engineering, and food process engineering. He has served as Associate Professor, Acting Head of WKH ,QGXVWULDO &RRUGLQDWLQJ 8QLW DQG 6XE 'HDQ RI WKH)DFXOW\ RI 7HFKQRORJ\ DW WKH 8QLYH graduate levels, courses in environmental engineering, environmental impact and risk assessment, water supply engineering, biological wastewater treatment, civil engineering project management, and sustainable energy.

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