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Adsorption Chemistry of Oil-in-Water Emulsion from Spent Oil Based Cutting Fluids Using Sawdust of *Mangifera indica*

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Abstract: Freundlich and Langmuir theories of surface chemistry for the adsorption of emulsified oil from spent cutting fluid generated by the use of semi-synthetic metal working fluid in metal machining operations using sawdust of *Mangifera indica* through batch adsorption study under optimized adsorptive pertinent factors were studied in the present research work. Adsorption of emulsified oil was favoured at low pH with maximum removal at pH=3 and temperature of 25 ^{0}C. Mathematical adsorption isotherms were predicted using linearized plots of adsorbed oil per unit weight of sawdust versus equilibrium oil-in-water concentration. These predicted isotherm model were compared with the Freundlich and Langmuir models. Numerical analysis has been used to calculate correlation coefficient of experimental observed adsorbed oil with predicted models. Results of present study for Freundlich and Langmuir kinetics for adsorption show the applicability of these theories for the adsorption of emulsified oil from semi-synthetic metal working fluid.

Key words: *Adsorption, Freundlich Isotherms, Langmuir Isotherms, Semi-synthetic Metal Working Fluid*

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