



GREENER APPROACH TO REMOVE METHYLENE BLUE (MB) USING CALCIUM HYDROXIDE DERIVED FROM EGGSHELLS

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The use of raw egg shells and egg shell powder calcined at 900oC as effective adsorbent materials for removal of dyes was studied. In order to understand the adsorption nature of these materials, methylene blue (MB) was used as the model dye. Though MB adsorption on to raw egg shell powder was previously recorded, a comparison on effective removal of dye using egg shell powder calcined at high temperature was not investigated. The two materials are inherently different as raw egg shell powder is mainly calcium carbonate while calcined egg shell powder is mostly calcium hydroxide. The kinetics of dye adsorption, type of adsorption mechanism and effect of light on adsorption process were compared for raw egg shell powder and calcined egg shell powder with sample containing dye only as the control. The results clearly showed that the enhanced efficiency of use of egg shell powder calcined at 900oC over raw egg shell powder for removing MB from water. The reported efficiency for calcined egg shell powder was 83% after two hours while raw egg shell powder indicated efficiency was 21% during the same period. Kinetics of MB dye removal follows a pseudo second order kinetics with rate constant of 30 min⁻¹. Adsorption properties of MB on to calcined egg shells indicate type II adsorption isotherm. In conclusion, the study showed use of calcined egg powder is a greener approach as waste is reused to remove dye.

Keywords: *Egg-shell powder, Dye Removal, Methylene Blue, Eco friendly*