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## A Comparative study of Sonosorption of Reactive Red 141 Dye on $TiO_2$, Banana Peel, Orange Peel and Hardwood Saw Dust

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**ABSTRACT**

*This work deals with the removal of Reactive Red 141 from its aqueous solution through adsorption by few discarded natural materials as adsorbent such as Orange Peel, Hardwood Sawdust and Banana Peel. Adsorption capacity of shade dried samples were determined experimentally under sonicated and unsonicated condition and compared with the adsorption capacity of $TiO_2$. Dye concentration was varied from 12 ppm through 16 ppm, 20 ppm and to 24 ppm. The adsorbent dose of 0.1gm and 0.2gm was taken at each concentration of dye. The adsorption capacity of different adsorbents was calculated for different time intervals 15, 30, 45, 60 and 75 min respectively, in the presence and absence of ultrasound. The isotherm data could be well described by the following adsorption isotherms; Langmuir, Freundlich and Temkin. The adsorption capacity was found to be in the order $TiO_2$ ≈ Orange Peel > Sawdust > Banana Peel. The adsorption of dye onto different adsorbent's surface followed pseudo second order kinetics. A mechanism for the adsorption and degradation of RR141 has also been explained. The present work revealed that the $TiO_2$, orange peel and hardwood sawdust were promising materials for the removal of dye from aqueous solutions under ultrasonic conditions, whereas, results with the banana peel were not encouraging.*

**Keywords:** Adsorption, Banana Peel, Orange Peel, Saw Dust, $TiO_2$.

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