



Adsorption of Crystal Violet Dye from Aqueous Solution onto the surface of Green Peas Shell (GPS)

Rajesh Dandge¹, Milind Ubale^{2*} and Shantilal Rathod¹

1. Milind College of Science, Aurangabad, **INDIA**

2. Research Center of Chemistry, Vasantao Naik Mahavidyalaya, Aurangabad, **INDIA**

Email: mbubale@gmail.com

Accepted on 8th June 2016

ABSTRACT

The adsorption of Crystal Violet (CV) cationic dye onto the surface of Green Peas Shell (GPS) was evaluated through batch adsorption experiment, in order to develop a low-cost, natural, eco-friendly and alternative adsorbent for the removal of organic pollutants. The effect of different parameters were studied such as pH (2-7), adsorbent mass (0.2 to 1.0 g), contact time (10 to 60 min), Initial dye concentration (25–50 mg L⁻¹), and temperature (293 K to 333K) on the adsorption of CV dye. The results showed that CV adsorption on the Green Peas Shell depends on Contact time, pH, initial dye concentration adsorbent dose, and temperature. The adsorption equilibrium data were fitted in Langmuir and Freundlich adsorption isotherm models. The adsorption data obtained were well described by Langmuir isotherm model with correlation coefficients ($R^2 = 0.99$). Maximum adsorption capacity of Green Peas Shell was found to be 96.974%. Thermodynamic study revealed that the adsorption of CV on Green Peas Shell is spontaneous physical adsorption process, exothermic and favorable. Experimental results indicate that the Green Peas Shell studied is a promising adsorbent for the removal of cationic dye molecules from aqueous solutions.

Keywords: GPS, CV, Adsorption, Batch experiment, Freundlich adsorption Isotherm.
