

THESIS TITLE : DETERMINATION OF THE SPECIFIC SURFACE AREA AND
ADSORPTION BEHAVIOUR OF HEAVY METALS ON SOME
ADSORBENTS

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ABSTRACT

Adsorption experiments had been studied for activated charcoal , kaolin , rice husk ash , and baked rice husk ash for two aspects:

1. Studies of adsorption behaviour by the construction of adsorption isotherm. Methylene blue was used as an adsorbate and specific surface area of each adsorbent was analysed.

2. Ability of each adsorbent in adsorbing some cations from dilute solutions i.e., Ag^+ Pb^{2+} and Cr^{3+} .

Initially , adsorption conditions were studied for each adsorption pair in order to find appropriate conditions, for example , initial weight of the adsorbent , concentration and acidity or basicity of the solutions, and time required to approach equilibrium . Spectrophotometry technique was use for the analysis of the concentration of the solutions. The overall results indicated that

1. Adsorption of methylene blue on activated charcoal , rice husk ash and backed rice husk ash were physical adsorption with Langmuir adsorption isotherm behaviour. Specific surface area of these adsorbents were analysed and found to be 520.1 , 28.9 and $375.7 \text{ m}^2 \text{ g}^{-1}$ respectively.

2. Adsorption of methylene blue on kaolin was chemical adsorption in nature with Langmuir adsorption type. Specific surface area was found to be $57.8 \text{ m}^2 \text{ g}^{-1}$.

3. The adsorbents studied had low capacity in adsorbing the cations Ag^+ Pb^{2+} and Cr^{3+} . The amount of the ions adsorbed was not depend on the specific surface area of the adsorbent but rather depended on the charge of the functional group attached to the surface. In order to increase the adsorptivity of the adsorbent, the charge of the surface must be modified and these would require further studies.