



PROGRAM BOOK

The 2nd International Conference on Applied Sciences, Mathematics and Informatics



Sponsor :



Institute of Research and
Community Services
University of Lampung



RADAR LAMPUNG
Selalu Ada yang Baru



Keywords : ZSM-5; Solid State Crystallization; natural silica; sugarcane bagasse ash

19. **Adsorption Isotherm of Phenol and Methylene Blue in Solution by Oil Palm Shell Activated Carbon**

Buhani Buhani; Suharso Suharso; Mita Rilyanti; Sumadi S

Buhani Buhani and Suharso Suharso (University of Lampung, Indonesia); Mita Rilyanti (Universitas Lampung, Indonesia); Sumadi S (University of Lampung, Indonesia)

Email: buhani@fmipa.unila.ac.id, suharso@fmipa.unila.ac.id,
mita.rilyanti@fmipa.unila.ac.id, sumadi.1973@eng.unila.ac.id

Abstract. In this research, it has been performed carbon activation of oil palm shells (CAC) prepared by chemical treatment as adsorbents of phenol and methylene blue (MB) in solution either in the form of single or in pair solution. The activation of carbon from the oil palm shells was done physically at a temperature of 700 °C for 1 hour continued with chemical activation using 10% H₃PO₄ for 24 hours. Identification of functional groups on the carbon from oil palm shell before and after chemically activated was performed using infrared spectrophotometer (IR) and analysis of its surface morphology was carried out using scanning electron microscope (SEM). The phenol and MB adsorption process was performed in single and binary systems using the batch method. The adsorption of phenol on CAC is optimum at pH 8 while MB at pH 11 with optimum contact time of 90 min for phenol and 120 min for MB respectively. The phenol and MB adsorption data on the CAC in the single system follow the pseudo-second-order kinetics model with the adsorption rate constant of 0.399 and 0.769 g mmol⁻¹ min⁻¹ respectively. The adsorption isotherms of phenol and MB in CAC tend to follow Freundlich adsorption isotherm pattern with the adsorption intensity factor (n) for phenol, MB, phenol/MB, and MB/phenol: 1.739, 1.341, 1.334, and 1.293 respectively. The adsorbent of CAC is effective to remove phenol and MB in solution, either in single or paired condition.

Keywords: Adsorption; activated carbon; phenol; methylene blue