



Characterization and Phenols Adsorption of Olive Stones Based Activated Carbon

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Abstract: Olive stones as a solid waste of Tunisian olive manufacture were used to prepare activated carbon (AC). The raw material was chemically activated with phosphoric acid. The textural characteristics, including surface area, pore volume and mean pore diameter, were determined by nitrogen adsorption at 77 K. FTIR spectroscopy, XPS, pH, pH_{pzc} and Bohem method were used to characterize the chemical surface. Iodine and phenol numbers were also determined. Single and binary mixture adsorption of phenol, 2 nitrophenol (2NP) and salicylic acid (SA) were studied in batch mode. The adsorption equilibrium of three solute were carried out in the range of 20-500 mg/l initial concentration at 30°C and $3 < pH < 4$. In single component system, the adsorption capacity increased in the order phenol < SA < 2NP. The experimental data in this case was analyzed by Langmuir and Freundlich isotherm models. Equilibrium data fitted well the Langmuir model. In binary system, the adsorption capacities for each component decrease due to the competition phenomena. The reduction extent in sorption capacity decreases in the order phenol > SA > 2NP.

Keywords: *Olive stones, Activated carbon, Adsorption, Co-adsorption, Phenolic compound.*

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