

Abstract

The present work is concerned with a comparative study to evaluate the adsorptive properties of activated carbons produced from coffee grounds. Activation was done using different chemical activation agents such as H_3PO_4 and ZnCl_2 either separately or mixed together. Characterization of these prepared samples was carried out by determining their physicochemical properties such as specific surface area, porosity, and surface acidity. The results indicated that the produced carbonaceous materials generally developed different and interesting porous structures. Indeed, H_3PO_4 -activated carbon (PPAC-P) develops a porous volume of $0.98 \text{ cm}^3/\text{g}$ and a surface acidity of $317.6 \text{ meq}/100 \text{ g}$ (with a high mesoporous proportion). By contrast, ZnCl_2 -activated carbon (PPAC-Z) seems to be the most microporous material with a rather limited surface acidity. Adsorption trials with Malathion, a commercial pesticide widely used in Algeria, were carried out onto produced samples of carbonaceous materials in batch experiments at 30°C . Various parameters such as pH, contact time, nature, and amount of adsorbent were investigated for removal efficiency under different operational conditions. Results herein showed that an interesting removal efficiency of 96% was achieved under the following conditions: pH 6, adsorbent amount of 1 g/L , and an equilibrium time of 60 min