

Abstract

Cyanide is considered one of the most dangerous compounds for the environment. They are discharged by various industries: chemical and metallurgical processes (extraction of gold and silver) and food industries. Adsorption is among the most used processes for elimination of cyanides particularly for the low concentrations. In this work, the cyanide removal is carried out by adsorption onto activated carbons prepared from olive stones and coffee ground. So we can promote this by-product as an inexpensive adsorbent. The prepared activated carbons are characterized by scanning electron micrograph and by determination of the physicochemical properties and specific surface area. All the adsorption experiments were performed in batch mode on synthetic water cyanide (KCN) at pH 10.8–11.0 to avoid volatilization of very toxic HCN. To describe the adsorption kinetics, the kinetic models of pseudo-first-order, pseudo-second-order, and intra-particle diffusion were applied. The experimental equilibrium data for adsorption of free cyanide were analyzed by the Langmuir, Freundlich, and Temkin isotherm models