

Abstract

This work is dedicated to the removal of the very toxic free cyanide from aqueous solution by oxidation with hydrogen peroxide H_2O_2 in the presence of activated carbon prepared from olive stones. Effects of the initial molar ratio $[\text{H}_2\text{O}_2]_0/[\text{CN}^-]_0$, the initial cyanide concentration, the activated carbon concentration and the temperature on cyanide removal have been examined. The removal of free cyanide in absence of activated carbon showed very slow kinetics. The presence of activated carbon has increased the reaction rate showing thus a catalytic activity. The kinetics of cyanide removal has been found to be of pseudo-first-order with respect to cyanide and the rate constants have been determined for different values of the aforementioned parameters. The apparent activation energy has been determined from tests carried out at three different temperatures. It was found equal to 46.2 kJ/mol in the presence of activated carbon, which is about half of the 82.7 kJ/mol found for the oxidation in absence of the activated carbon. This process can be interesting for the cyanide removal from processed solutions because it does not use soluble metal catalyst and it consumes only hydrogen peroxide as chemical product