

Kinetic and Thermodynamic Studies on Adsorption of Copper (II) Ions onto the Olive Pomace Lignocellulosic in the Region of Beni Mellal (Morocco)

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Despite the recent developments in the field of wastewater treatment, and despite the new modern technologies that have emerged in this domain, adsorption is still a reliable procedure for the removal of toxic substances such as heavy metals from wastewater. The aim of the present work is the valorization of lignocellulosic material prepared from olive pomace in the field of pollutant treatment of various liquid effluents containing heavy metals toxins such as copper. The chemical characterization of the surface was carried out by the pH at the point of zero charge; this indicates the acidic character of the materials. The satisfactory operating conditions were performed at pH 4, a particle size below 80 μm and a temperature of 20°C. The characterization of solids obtained before and after extraction of the hemicellulose of the olive pomace was performed by IR and SME. The results showed that the extraction of hemicellulose has a great influence on the structural, textural and morphological properties as well as the cation exchange capacity (CEC) of olive pomace. The kinetic study (pseudo-first order and pseudo-second-order), thermodynamic and mechanistic isotherms (Langmuir, Freundlich, Temkin, and Dubinin Radushkevich) of the adsorption of Cu(II) ions on the lignocellulosic obtained from the olive pomace was conducted in aqueous solution. The results were permeated to specify, in a static reactor, the adsorption kinetics and the thermodynamic parameters of adsorption of copper ions.