

ADSORPTION OF COPPER FROM AQUEOUS SOLUTIONS BY USING NATURAL CLAY

Ismael Sayed ISMAEL¹, Sherif KHARBISH^{1*}, Eman M. SAAD² & Ali MAGED¹

¹ Suez University, Faculty of Science, Geological Department El salam, Suez, Egypt

² Suez University, Faculty of Science, Chemistry Department El salam, Suez, Egypt

* e.mail: sherifkharbish@hotmail.com Tel: +20 111 33 77 024

Abstract: In this study, removal of copper (Cu^{2+}) from aqueous solutions is investigated using a natural clay. During the removal process, batch technique is used, and the effects of pH, clay amount, heavy metal concentration and agitation time on adsorption efficiency are studied. Langmuir, Freundlich and Dubinin–Radushkevich (D–R) isotherms are applied in order to determine the efficiency of natural clay used as an adsorbent. Results show that all isotherms are linear. It is determined that adsorption of Cu^{2+} is well-fitted by the second order reaction kinetic. In addition, calculated and experimental heavy metal amounts adsorbed by the unit clay mass are too close to each other. It is concluded that natural clay can be used as an effective adsorbent for removing Cu^{2+} from aqueous solutions.

Keywords: Natural clay; Copper; Zinc; Freundlich isotherm; Langmuir isotherm; D–R isotherm; Reaction kinetic