



Competitive Adsorption of Cadmium Lead and Mercury Ions onto Activated Carbon in Batch Adsorber

Abbas H. Sulaymon, Hayder M. Abdul-Hameed*

Environmental Engineering Department, College of Engineering, University of Baghdad, Baghdad, Iraq

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Abstract: In the present research a wide range of batch experiments were carried out for estimation of the key process parameters in competitive adsorption of Cd(II), Pb(II) and Hg(II) from simulated of wastewater onto activated carbon in batch adsorber. A batch adsorber model has been used to determine the external mass transfer coefficient and diffusion coefficient for single, binary and ternary component systems. Eight isotherm models were used. The Langmuir model gave the best fit for the data of single component, while for the binary and ternary systems fitted successfully with extended Langmuir model. The degree of removal of Cd(II), Pb(II) and Hg(II) was found to be 89.9%, 99.42% and 97.4% respectively at the optimum agitation speed ranged from 800-1000 rpm. The optimum wet of the activated carbon were determined for achieving maximum degree removal for single, binary and ternary system. Statistical technique correlation (HYBRID) and R^2 used to enhance the justification analysis for each used model.

Keyword: *Activated carbon, Langmuir model, pore diffusion, Cd(II), Pb(II), Hg(II).*

*Corresponding: E-Mail: hayder3almunshi@yahoo.com , Tel: (964) (7901) (846925)