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## STATISTICAL DESIGN OF EXPERIMENTS FOR THE Cr(VI) ADSORPTION ON WEED *Salvinia cucullata*

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### Abstract

Experiments were designed to optimize the Cr(VI) adsorption on *Salvinia cucullata*. The significance of different adsorption parameters along with their combined effect on the adsorption process has been established. A regression equation was formulated by representing percentage of Cr(VI) adsorption as a function of different independent variables such as contact time, pH, adsorbate concentration and adsorbent dose. The insignificant terms were assessed through student ‘t’ test and are removed from the regression equation. The resulting regression equation after removal of the insignificant terms was verified by using Fisher’s adequacy test. The pH coefficient was the most dominant followed by adsorbate concentration and contact time. Adsorbent dose induces a small effect on adsorption process. Among the interaction term combined effect of contact time and adsorbate concentration has the most influential effect followed by combined effect of time, pH and adsorbate concentration. Combined effect of pH and adsorbate concentration has the least effect among the interaction term. From the response optimization analysis the optimum time, pH, adsorbate concentration and adsorbent dose were found to be 300 min, 1.6, 400 mg/L and 2.4 g/L respectively. Multivariate analysis technique was used to find out the correlation among different adsorption parameters. The factorial analysis showed that the response variable can be explained by five factors and they explain more than 86 % of total variance.

*Key words:* adsorption, Cr(VI); regression, statistical design, wastewater treatment

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