The aim of this study is to obtain optimal adsorption conditions for enrofloxacin (ENR) as a fluoroquinolone antibiotic onto NaOH-modified rice husk using response surface methodology (RSM). On the basis of a four variable Box–Behnken design (BBD), RSM was used to determine the effect of adsorbent dose (0.25, 0.5, and 0.75 g L\(^{-1}\)), pH (5, 7, and 9), ENR initial concentration (25, 75, and 125 mg L\(^{-1}\)), and temperature (15, 30, and 45\(^\circ\)C) on adsorption efficiency. By applying the quadratic regression analysis, among the main parameters, the removal efficiency was significantly affected by all the four variables. The results showed that the predicted values for ENR adsorption were close to the experimental values and were in good agreement. In addition, the \(R^2\) value (\(R^2 = 0.9705\)) indicates that the regression is able to give a good predict of response for the adsorption process in the studied range. From the BBD predictions, the optimal conditions for 92.25\% ENR removal were found to be 0.69 g L\(^{-1}\) of adsorbent dose, pH 5.11, and initial concentration of ENR 25.02 mg L\(^{-1}\), at temperature 36.43\(^\circ\)C.

Keywords: Fluoroquinolone; Enrofloxacin; Adsorption; Agricultural waste; Rice husk; Box–Behnken