Kinetic analysis of the adsorption of lead (II) onto activated carbon from *Tridax procumbens*

ABSTRACT

Adults who are exposed to high levels of lead may develop hypertension and kidney damage. Lead exposure is dangerous for everyone, but it can have devastating effects on pregnant women and their babies. Methods such as membrane separation, ion exchange, precipitation, and biosorption are currently in use for the removal of lead pollution. Biosorption has the fewest negative aspects of these technologies due to its low operating costs, high efficiency at detoxifying low concentrations of toxicants, and small volume of disposal materials. The biosorption of the biosorption of lead (II) onto the activated carbon from *Tridax procumbens* is remodeled using nonlinear regression and the optimal mode was determined by a series of error function assessments. The best kinetic model for adsorption of lead (II) was Pseudo-1st order with a reasonable difference in terms of corrected Akaike Information Criterion to the next best model, which was pseudo-2^{nd} order, and followed by the Elovich. However, the error function analyses especially the AICc was not conclusive in ranking the pseudo-1st order model as the best model due to the low (less than 5) absolute values of differences between the model. The pseudo-1^{st} order kinetic constants obtained were qe (mg/g) of 6.181 (95% confidence interval from 5.009 to 7.352) and k_1 (per min) of 0.007 (95% confidence interval from 0.004 to 0.009). Nonlinear modeling enables the determination of a 95 percent confidence interval for the uncertainty range, which can be used in model comparison and discriminant analysis.