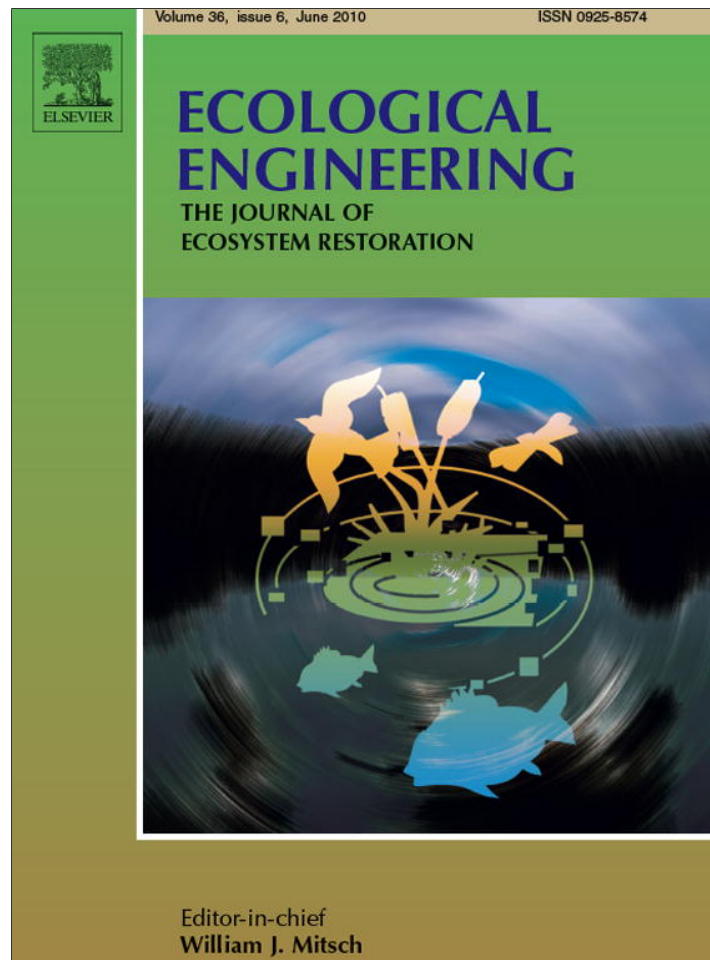


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## Letter to the Editor

**Comments on "Removal and recovery of Cu(II) and Zn(II) using immobilized *Mentha arvensis* distillation waste biomass"**

Recently, Hanif et al. (2009) published the paper entitled as above. In section of 3.7 Kinetic modeling, the authors noticed "Two different kinetic models were used to adjust the experimental data of Zn(II) and Cu(II) biosorption on to IMADW biomass." with the pseudo-first-order Lagergren model, Eq. (4), and the pseudo-second-order model, Eqs. (5) and (6) without any citations. Authors also noticed "Integrating (5) for the boundary conditions  $t = 0$  to  $t = t$  and  $q = 0$  to  $q = q_e$ , then the form of the equation obtained is." In fact Eq. (6) could not be obtained from integrating Eq. (5). Eq (6) is not correct.

Lagergren's kinetics equation has been most widely used for the adsorption of an adsorbate from an aqueous solution, and citation review of Lagergren's kinetic rate equation on adsorption reactions has also been reported (Ho, 2004). The correct reference citing the original Lagergren paper was first presented by Ho et al. in 1998 (Ho and McKay, 1998a): "S. Lagergren, zur theorie der sogenannten adsorption gelöster stoffe, Kungliga Svenska Vetenskapsakademiens, Handlingar, Band 24, No. 4, (1898), 1–39." Its English translation is "S. Lagergren, About the theory of so-called adsorption of soluble substances, Kungliga Svenska Vetenskapsakademiens, Handlingar, Band 24, No. 4, (1898), 1–39" (Ho and McKay, 1998a), and the abbreviation style is "S. Lagergren, zur theorie der sogenannten adsorption gelöster stoffe, K. Sven. Vetenskapsakad. Handl., Band 24, No. 4, (1898), 1–39." In order to distinguish the kinetics equation based on the adsorption capacity of solid from the concentration of solution, Lagergren's first-order rate equation has been called pseudo-first-order since 1998 (Ho and McKay, 1998a). The pseudo-second-order kinetic expression for the adsorption systems of divalent metal ions using sphagnum peat moss was presented by Ho (1995). A modified model was made in the following years because a mistake was included in Ho's thesis in 1995 (Ho and McKay, 1998a,b). A review of second-order models for adsorption systems has also been presented (Ho, 2006).

One common mistake is to cite papers that are devoid of the original information, but have used the original information of others to develop their own arguments (Taylor and Mc Brown, 2001). To cite the original paper is not only respecting authors who presented a novel idea in research but also to read the original idea in detail of the work. Accuracy of quotations and citations is very important for the transmission of scientific knowledge. I suggest that Hanif et al. cite the original or the most frequently cited papers for the kinetic models to have more accuracy and details of information about kinetic expressions.

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