Letter to the Editor

Comments on the paper "Preparation of activated carbon from Xinjiang region coal by microwave activation and its application in naphthalene, phenanthrene, and pyrene adsorption"

Recently, Xiao et al. [1] published the paper entitled "Preparation of activated carbon from Xinjiang region coal by microwave activation and its application in naphthalene, phenanthrene, and pyrene adsorption". In Section of 2.4.3. Adsorption kinetics, authors mentioned "The pseudo-first-order kinetic rate equation is expressed as:

$$\frac{1}{Q_t} = \frac{1}{Q_e} + \frac{k_1}{Q_e t} \qquad (4)$$

where k_1 is the rate constant of pseudo-first-order sorption (min), which can be determined from the slope of the linearized pseudo-first-order rate equation." and cited a reference Zhong et al. 2012 [2].

This is a quotation error. Equation (4) could not be found in the cited reference [2]. In fact, Eq. (4) is not correct. Thus results and conclusion in "Preparation of activated carbon from Xinjiang region coal by microwave activation and its application in naphthalene, phenanthrene, and pyrene adsorption" might not be correct.

In 1898, Lagergren firstly presented the first order rate equation for the adsorption of oxalic acid and malonic acid onto charcoal [3]. In order to distinguish kinetics equation based on concentration of solution and adsorption capacity of solid, Lagergren's first order rate equation has been called pseudo-first order since 1998 [4,5]. Details of Lagergren rate equation for adsorption reactions were published in 2004 [6]. The most popular form used is:

$$\log(q_e - q_t) = \log(q_e) - \frac{k}{2.303}t$$

q_e and q_t (mg/g) are the adsorption capacities at equilibrium and at time t (min) respectively. k (1/min) is the rate constant of pseudo-first order adsorption.

In 2015, Xiao and co-workers published the same mistake in *Chemical Engineering and Processing* [7] and *Korean Journal of Chemical Engineering* [8]. However only a few related comment was accepted in some journals such as *Food Chemistry* [9], *Journal of Molecular Liquids* [10], and *Journal of Environmental Sciences-China* [11].

In order to stop the proliferation of the mistake of the pseudo-first order model, a comment has been made [9]. This type of error could be avoided if authors have had paid more attentions to details about the model from the original paper [12]. Citing the original paper not only respects the work of the authors who presented a novel research idea but also discussed this idea in detail in the body of their paper [13]. In my view, Xiao et al. should have cited the original paper for the pseudo-first order kinetic model and thereby provided greater accuracy and information details about the kinetic expression they employed.

References

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