



## Reply to the comment on "Acid Green 25 removal from wastewater by organo-bentonite from Pacitan" by R. Koswojo, R. P. Utomo, Y.-H. Ju, A. Ayucitra, F. E. Soetaredjo, J. Sunarso, S. Ismadji [Applied Clay Science 48 (2010) 81–86]

Rhesa Pramudhita Utomo<sup>a,b</sup>, Raymond Koswojo<sup>a,b</sup>, Yi-Hsu Ju<sup>a</sup>, Aning Ayucitra<sup>a,b</sup>, Felycia Edi Soetaredjo<sup>a</sup>, Jaka Sunarso<sup>c</sup>, Suryadi Ismadji<sup>a,b,\*</sup>

<sup>a</sup> Department of Chemical Engineering, National Taiwan University of Science and Technology, 43, sec. 4 Keelung Rd., Taipei 106, Taiwan

<sup>b</sup> Department of Chemical Engineering, Widya Mandala Surabaya Catholic University, Kalijudan 37, Surabaya 60114, Indonesia

<sup>c</sup> School of Chemical Engineering, The University of Queensland, St. Lucia, Qld 4072, Australia

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### ABSTRACT

This letter is a response to the comment by Professor Ho on our recent article entitled "Acid Green 25 removal from wastewater by organo-bentonite from Pacitan" published in Applied Clay Science 48 (2010) 81–86. Professor Ho raised an issue about citation misleading for the pseudo-first and second order kinetic equations which are widely used to correlate kinetic adsorption data. This letter is intended to clarify the misunderstanding and present the correct citations.

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This letter is intended as a response to the comment by Professor Ho (Ho, 2010) on our recent work (Koswojo et al., 2010) and other previous works (Chandra et al., 2007; Febrianto et al., 2009; Lesmana et al., 2009) about the missing citation of pseudo-first and second order kinetic equations. In his comment, Professor Ho mentioned that the authors presented and used these models without any citation on the original papers. He also pointed out the importance of citing the original paper for the pseudo-first and second order kinetic models to have more accuracy and information about the expression. Since all of our works have been published and the correction is no longer possible, we are hoping that including the missing citations in this letter will rectify this issue.

As a note, similar comments have been addressed by Professor Ho to numerous authors who have also utilized these models without citing his papers properly (Ho, 2005a,b,c, 2006, 2007, 2009a,b,c, 2010). To that end, we would like to thank Professor Ho for his pointing out our hindsight for not including the proper citations. We entirely agree with him that the credit should be given on the original papers which proposed the pseudo-first and second order kinetic models. We forgot to include these citations without any motivation to claim models or

equations invented by the other researchers as ours (Chandra et al., 2007; Febrianto et al., 2009; Koswojo et al., 2010; Lesmana et al., 2009).

The pseudo-first and second order kinetic models are well known models to correlate the adsorption dynamic or kinetic data for various systems. In the present time, based on our literature search with different search engines, we found hundreds or even thousands of studies using these models to correlate the adsorption kinetic data. Furthermore, it has come to our attention that da Costa (2004) and Kumar and Rattanaphani (2007) mentioned that the wide acceptability of models by the scientific community is the best means of providing credibility to such models. Therefore, the original references of pseudo-first and second order kinetic models especially the papers which dealt with mathematical modification and different mathematical expression of the models need not always be cited (da Costa, 2004; Kumar and Rattanaphani, 2007; Ozacar, 2005; Wu, 2009).

The pseudo-second order kinetic is commonly associated with the situation when the rate of direct adsorption/desorption process controls the overall sorption kinetics (Plazinski et al., 2009) and the first mathematical expression of this model was given by Blanchard et al. (1984). The linearized form of this model was then proposed by Ho (1995). Indeed, the most commonly used form of this model is the one presented by Ho (1995) and Ho et al. (1996) as mentioned by Plazinski et al. (2009). Properly speaking, the credit should always be given to the first papers proposing the model (Kumar, 2006a,b; Kumar and Favere, 2006; Kumar and Guha, 2006; Kumar and Rattanaphani, 2007; Wu, 2009). Accordingly, to correct the mis-citation in our papers (Chandra et al., 2007; Febrianto et al., 2009; Koswojo et al., 2010; Lesmana et al.,

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\* Corresponding author. Department of Chemical Engineering, Widya Mandala Surabaya Catholic University, Kalijudan 37, Surabaya 60114, Indonesia. Tel.: +62 31 3891264; fax: +62 31 3891267.

E-mail address: [suryadiismadji@yahoo.com](mailto:suryadiismadji@yahoo.com) (S. Ismadji).

2009), we would like to cite the original paper by Blanchard et al. (1984) as the reference for pseudo-second order kinetic model.

Plazinski et al. (2009) mentioned that the earliest known equation to describe the rate of sorption in the liquid phase system was proposed by Lagergren in 19th century (Lagergren, 1898). This equation is known as Lagergren's first-order rate equation. Ho (2010) mentioned that the paper by Ho and McKay (1998) is the first paper to define this equation as pseudo-first order kinetic. However, the expression for pseudo-first order was employed by Sharma et al. (1990) to correlate the sorption kinetic of Ni(II) in wollastonite. Nevertheless, we agree with Professor Ho's suggestion to cite the original papers for the pseudo-first and second order kinetic models to have more accuracy and information about the expression. Therefore, for the first order rate equation which was later known as pseudo-first order model, we would like to cite the work by Lagergren (1898) to rectify missing citation in our previous papers.

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