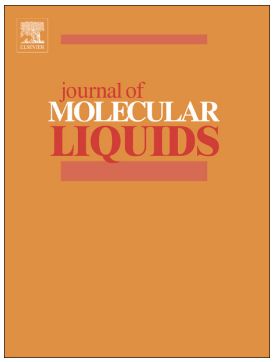

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Insights into mathematical characteristics of adsorption models and physical meaning of corresponding parameters

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Abstract

Kinetic and isotherm studies have received extensive attention by many researchers. Elucidating mathematical characteristics of the most widely used kinetic and isotherm models including the pseudo-first-order (PFO) and pseudo-second-order (PSO) kinetic equations and the Langmuir and Freundlich isotherms was of prime significance for understanding adsorption processes. We found that these kinetic and isotherm models were derived from the appropriate transformation of elementary functions, revealing the mathematical law that these models conformed to. Effects of the Langmuir constant K_L and the empirical parameter n of the Freundlich isotherm on the isotherm curves were also investigated. Comprehending the mathematical law that these models follow will conduce to insights into distribution of solute in the solid/solution phases.

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