

A Review of Soil Adsorption Isotherm Modeling

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Abstract

Concern about environmental protection is on the rise on a global scale. The development of contaminant removal techniques using adsorption processes is nowadays finding global acceptance in environmental chemistry for their low costs, simple design, ease of operation, insensitivity to toxic substances, and perfect pollutant removal efficiency. Recent advances in isotherm modeling have attracted a growing interest in this research field. The present paper presents a state-of-the-art review of adsorption isotherm modeling, its fundamental characteristics, and mathematical derivations while a brief history of isothermal studies on Iranian soils is also provided. Another aspect of the paper is the investigation of the key advances in error functions and principles of their application together with comparisons of linear and non-linear isotherm models. It will finally be shown that the extensive use of nonlinear isotherms bears witness to their potentials as a powerful instrument that have led to new horizons in adsorption science.

Key words: Isotherm, Adsorption, Linear, Nonlinear, Soil.

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