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Behavior of Cesium in Dam Reservoir-I nvestigation Based on Sediment Columns

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ABSTRACT

To generate information for better understanding of the behavior of cesium in relatively closed water bodies, experiments using four columns consisted of the sediment phase and the overlying water phase, together with batch sorption experiments were conducted, and the kinetics and the binding potential of cesium by sediment were investigated. Through model analysis with both the first order and the pseudo-second order reaction models, the kinetic parameters of cesium within the four columns were determined. In addition, by analyzing batch equilibrium data with both Freundlich and Langmuir isotherm models, associated sorption parameters were also generated. Comparisons of the models' suitability for description of both kinetics and binding capacity of cesium were thus made, and the effects of pH and EC on the binding capacity were also studied.

KEYWORDS

Cesium; Sediment; Sorption Capacity; Sorption Kinetics; Water Safety; Surface Water

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References

- [1] K. Volcheka, M. Y. Miah, W. Kuang, Z. DeMaleki and F. H. Tezel, " Adsorption of Cesium on Cement Mortar from Aqueous Solutions," *Journal of Hazardous Materials*, Vol. 194, 2011, pp. 331-337. doi:10.1016/j.jhazmat.2011.07.111
- [2] R. R. Sheha and E. Metwally, " Equilibrium Isotherm Modeling of Cesium Adsorption onto Magnetic Materials," *Journal of Hazardous Materials*, Vol. 143, 2007, pp. 354-361. doi:10.1016/j.jhazmat.2006.09.041
- [3] S. Tsai, T. Wang, M. Li, Y. Wei and S. Teng, " Cesium Adsorption and Distribution onto Crushed Granite under Different Physicochemical Conditions," *Journal of Hazardous Materials*, Vol. 161, 2009, pp. 854-861. doi:10.1016/j.jhazmat.2008.04.044
- [4] A. K. Bhattacharya and C. Vekobachar, " Removal of Cadmium (II) by Low Cost Adsorbents," *Journal of Environmental Engineering*, Vol. 110, No. 1, 1984, pp. 110-122. doi:10.1061/(ASCE)0733-9372 (1984)110:1(110)
- [5] N. Roostai and F. H. Tezel, " Removal of Phenol from Aqueous Solutions by Adsorption," *Journal of Environmental Management*, Vol. 70, No. 2, 2004, pp. 157-164. doi:10.1016/j.jenvman.2003.11.004
- [6] N. Chiron, R. Guilet and E. Deydier, " Adsorption of Cu (II) and Pb(II) onto a Grafted Silica: Isotherms and Kinetic Models," *Water Research*, Vol. 37, No. 13, 2003, pp. 3079-3086. doi:10.1016/S0043-1354(03)00156-8
- [7] Y. S. Ho and A. E. Ofomaja, " Kinetic Studies of Copper Ion Adsorption on Palm Kernel Fiber," *Journal of Hazardous Materials*, Vol. 137, No. 3, 2006, pp. 1796-1802. doi:10.1016/j.jhazmat.2006.05.023

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- [8] I. Nouri, I. Ghoubane, O. Hamadaoui and M. Chiba, " Batch Sorption Dynamics and Equilibrium for the Removal of Cadmium Ions from Aqueous Phase Using Wheat Barn," *Journal of Hazardous Materials*, Vol. 149, No. 1, 2007, pp. 115-125. doi:10.1016/j.jhazmat.2007.03.055
- [9] N. Bektas, B. Akman and S. Kara, " Kinetic and Equilibrium Studies in Removing Lead Ions from Aqueous Solutions by Natural Sepiolite," *Journal of Hazardous Materials*, Vol. 112, No. 1-2, 2004, pp. 115-122. doi:10.1016/j.jhazmat.2004.04.015
- [10] T. H. Wang, M. H. Li, W. C. Yeh, Y. Y. Wei and S. P. Teng, " Removal of Cesium Ions from Aqueous Solution by Adsorption onto Local Taiwan Laterite," *Journal of Hazardous Materials*, Vol. 160, No. 2-3, 2008, pp. 638- 642. doi:10.1016/j.jhazmat.2008.03.050
- [11] S. Tsai, T. Wang, M. Li, Y. Wei and S. Teng, " Cesium Adsorption and Distribution onto Crushed Granite under Different Physicochemical Conditions," *Journal of Hazardous Materials*, Vol. 161, No.