



Efficiency of perlite as a low cost adsorbent applied to removal of Pb and Cd from paint industry effluent

Mohammad Malakootian^{a,*}, Nemat-allah Jaafarzadeh^b, Hiwa Hossaini^c

^a*School of public Health, Kerman University of Medical Sciences, Haftbagh-Alavi Highway, Kerman, Iran
Tel. +98-0341-3205074; email: m.malakootian@yahoo.com*

^b*School of Public Health, Environmental Health Department, Ahvaz Jondishapour University of Medical Sciences, Ahvaz, Iran*

^c*Ph.D. student of Environmental Health Engineering, Department of Environmental Health, Tarbiat Modares University, Tehran, Iran*

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ABSTRACT

Among the major environmental concerns worldwide is release of heavy metals in the environment. Different studies have demonstrated that natural volcanic glass has high capacity in removal of divalent heavy metal ions. Perlite is a volcanic rock with high porosity and specific surface area which costs much lower in comparison with the other adsorbents. In this study, the removal of lead and cadmium from Binalood paint industry (Kerman, Iran) effluent by perlite is investigated in batch conditions. Lead and cadmium measurements are carried out with atomic absorption spectrophotometric methods adapted from standard methods applied to the examination of water and wastewaters. In this regard, the effect of pH, dosage and contact time is also determined and Langmuir and Freundlich isotherms are obtained. Results show that adsorption process follows Freundlich adsorption isotherm model. The maximum obtained removal efficiency at pH = 7 are close to 100% and 97.7% for lead and cadmium, respectively. These efficiencies are achieved in 10 g/l perlite and recommended contact time is 1.5 h. Finally, perlite is recommended as a low cost and accessible adsorbent to remove lead and cadmium from municipal and industrial wastewaters.

Keywords: Lead; Cadmium; Adsorption; Perlite; Paint industry

*Corresponding author.