

## عنوان مقاله:

Studies on optimization of efficient parameters for removal of lead from aqueous solutions by natural zeolite as a low-cost adsorbent using response surface methodology

## محل انتشار:

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## خلاصه مقاله:

In this research, the removal of lead from the aqueous solution was investigated using natural nontoxic zeolite (clinoptilolite) as a low-cost adsorbent in order to reduce human exposure to it. The clinoptilolite zeolite obtained from the Semnan area was characterized by X-ray diffraction pattern, FTIR spectroscopy and scanning electron microscopy (SEM). The central composite design (CCD) defined under the response surface methodology (RSM) was used for designing the experiments and analyzing the sorption of lead. Three parameters of contact time (43.07-101.93 min), initial concentration (508-3006 mg/L) and temperature (20-51°C) were applied to optimize the removal percentage of lead by zeolite. It was found that the initial concentration is the most important parameter affecting the removal percentage of lead, followed by the temperature of process. The optimum values of initial concentration, contact time and temperature were found to be 2750 ppm, 82.87 min and 65°C for 99.81% removal of lead, respectively, with a high desirability of 0.990. The adsorption data fitted the Freundlich adsorption model better than (the Langmuir model, with the maximum sorption capacity of the clinoptilolite zeolite for Pb(II) equaling 136.99 (mg/g).

## کلمات کلیدی:

Lead, Clinoptilolite, Zeolite, Adsorption isotherms, Response surface methodology

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