

Removal of As(V) from aqueous system using steel-making by-product

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ABSTRACT

For As(V) removal aqueous system, 3 types slag which is a waste product from steel making process was used. Arsenic was mainly removed by Ca-As precipitation such as form $\text{Ca}_3(\text{AsO}_4)_2$. The removal efficiency of arsenic on slag was affected by iron oxide contents because arsenic was removed by adsorption on iron oxide. The experimental results were well fitted by pseudo-second-order and Langmuir isotherm model compared to other models. Arsenic was completely removed by Slag Y and Slag J within 12 h, 0.5 g and 0.7 g of Slag Y and Slag J are sufficient to remove arsenic of 20 mg/l arsenic. The removal efficiency increases with the decrease of initial pH and the decrease of initial arsenic concentration. The calcium that is a major component comes from dissolution of the lime (CaO). The calcium concentration increased at low initial pH because the solubility of the lime (CaO) increases at acidic condition. The equilibrium pH sharply increase after reaction because of creation of hydroxide ion.

Keywords: Arsenic; Langmuir; Precipitation; Pseudo-second-order; Steel making slag

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