Adsorption performance of heavy metal ions between EAF steel slag and common mineral adsorbents

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\textbf{ABSTRACT}

Heavy metal pollution in water has been a serious environmental problem in recent years. Selecting favorable heavy metal adsorption materials for wastewater treatment is very important. Two kinds of electric arc furnace (EAF) steel slags, clinoptilolite, ceramsite, and expanded vermiculite, which were investigated in this study to select favorable heavy metal adsorption materials, could adsorb three kinds of heavy metal ions (Cu\textsuperscript{2+}, Cd\textsuperscript{2+}, and Pb\textsuperscript{2+}). The isotherm adsorption, as well as the effects of adsorption time and dosage on the heavy metal ion removal capability of these adsorption materials, was analyzed in this research. Results showed that the capability of the EAF steel slags to adsorb Cu\textsuperscript{2+}, Cd\textsuperscript{2+}, and Pb\textsuperscript{2+} was evidently higher than those of clinoptilolite, ceramsite, and expanded vermiculite. The dosages of the EAF steel slags required to remove the same quantity of the three heavy metal ions were the least among the aforementioned adsorbents. The EAF steel slags have wide application prospects for heavy metal adsorption in wastewater treatment.

\textit{Keywords:} Electric arc furnace steel slag; Common adsorbent; Isotherm adsorption; Time; Dosage

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