

Waste Stabilization/Solidification (S/S) using fly ash-based geopolymers. Influence of carbonation on the S/S of an EAF dust

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ABSTRACT

The effect of curing in a carbonated atmosphere of the solid samples obtained after the stabilization/solidification of electric arc furnace (EAF) dust using ash based-geopolymerization technology is described in this paper. The EAF dust treated contains hazardous metals such as Pb, Cd, Cr or Zn. Different geopolymer agents as potassium hydroxide, potassium silicate, metakaolin and blast furnace slag have been used. Mixtures of EAF waste with this kind of geopolymeric materials and class F fly ash have been processed. After that, solid S/S samples were subjected to an accelerated carbonation test. Compressive strength test and different leaching tests for determining the efficiency of heavy metal immobilization have been carried out. Comparison of coal fly ash-based geopolymer systems with classical Portland cement stabilization methods has also been accomplished. Compressive strength was increased when samples were cured in a carbonated atmosphere. In addition, carbonation increased the buffering capacity of samples improving the Zn retention.

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