

Possible paths of secondary PbO precipitation in slags from the pyrometallurgical process of zinc and lead production

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Slags formed in the pyrometallurgical process of zinc and lead production are disposed at the Hazardous Waste Landfill.

The main phases present in the slags that remained for 2 years in the landfill include, in a 0.20 m deep layer (oxidation zone), sulphides (digenite, cubanite, sphalerite, galena), oxides (PbO), metallic alloys and native silver.

Despite the oxidative conditions, the residence time of the slag in the landfill was probably too short to transform the sulphide phases into secondary components characteristic of the oxidation zone (sulphates, carbonates, oxides).

Studies show that within certain ranges of pH and Eh values in the soil and water environment, sulphides of copper and sulphides of copper and iron, as well as lead oxide, will decompose, creating thereby a potential source of metal migration to the environment.

An important parameter for the migration of lead in the landfill area, in addition to pH and Eh, is its concentration in groundwater. High mobility of PbO may promote the increase in the concentration of Pb species in these waters, and consequently it may lead to its reprecipitation, and formation of secondary PbO.