

Accepted Manuscript

Title: Zinc Recovery from Purified Electric Arc Furnace Dust
Leach Liquors by Chemical Precipitation

Authors: P. Xanthopoulos, S. Agatzini-Leonardou, P.
Oustadakis, P.E. Tsakiridis



PII: S2213-3437(17)30327-5
DOI: <http://dx.doi.org/doi:10.1016/j.jece.2017.07.023>
Reference: JECE 1738

To appear in:

Received date: 15-5-2017
Revised date: 9-6-2017
Accepted date: 10-7-2017

Please cite this article as: P.Xanthopoulos, S.Agatzini-Leonardou, P.Oustadakis, P.E.Tsakiridis, Zinc Recovery from Purified Electric Arc Furnace Dust Leach Liquors by Chemical Precipitation, Journal of Environmental Chemical Engineering <http://dx.doi.org/10.1016/j.jece.2017.07.023>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Zinc Recovery from Purified Electric Arc Furnace Dust Leach Liquors by Chemical Precipitation

*P. Xanthopoulos, S. Agatzini-Leonardou, P. Oustadakis, P.E. Tsakiridis**

School of Mining and Metallurgical Engineering, Laboratory of Metallurgy

National Technical University of Athens, Greece

www.hydrometallurgy.metal.ntua.gr

9, Iroon Polytechniou Street, 157 80 Zografou, Athens, Greece

***Corresponding Author**

e-mail address: ptsakiri@central.ntua.gr

Tel: +30-210-7722181

Fax: +30-210-7722218

Abstract

The present work aims at determining the experimental conditions for the recovery of zinc from leach liquors, produced through dilute sulphuric acid leaching of electric arc furnace dust (EAFD), at atmospheric pressure. Zn can be recovered as an easily filterable precipitate. More specifically, zinc was precipitated by 99.5% with the form of a mixed white fine crystalline powder, comprising of hydrozincite ($3\text{ZnCO}_3 \cdot 3\text{Zn(OH)}_2$) and zinc carbonate hydroxide hydrate ($\text{ZnCO}_3 \cdot 3\text{Zn(OH)}_2 \cdot \text{H}_2\text{O}$). Zn precipitation was carried out in a pH range of 6.5-7 at 25 °C. The addition of different types of carbonated salts, such as sodium carbonate, sodium bicarbonate or ammonium carbonate, either with the form of suspensions or as solids, was investigated. The produced precipitates were characterized through means of particle size distribution analysis, chemical analysis, X-ray diffraction (XRD), thermogravimetric/differential analyses (TG-DTA) and Fourier transform infrared spectroscopy (FT-IR), whereas their microstructure and morphological characteristics were studied by scanning and transmission electron and microscopy (SEM/TEM). High grade zinc precipitates were obtained, as manganese concentrations did not exceed 1%, whereas traces of Cr, Cu and Pb were also detected.

Keywords: Zinc, Carbonate Precipitation, Leach Liquors, Electric Arc Furnace Dust

Download English Version:

<https://daneshyari.com/en/article/4908712>

Download Persian Version:

<https://daneshyari.com/article/4908712>

[Daneshyari.com](https://daneshyari.com)