Category: Thermodynamics and Phase Diagram Studies

Chloridizing Roasting of Spent NdFeB Magnet Using Ammonium Chloride

N.S. Randhawa,[a,]* Aarti Kumari[a] and S.K. Sahu[a]

[a]Metal Extraction & Recycling Division, CSIR-National Metallurgical Laboratory, Jamshedpur-831007
*Email: nsrandhawa@gmail.com, Telephone: +91-9835590339

Abstract

The thermogravimetry is a useful tool to understand the roasting behavior of ores and minerals. Roasting of spent rare earth magnet (NdFeB) has evolved as attractive method for recycling of rare earth elements (REE) to conserve their scarce resources. We studied the chloridizing roasting of spent magnets of wind turbines with an objective to selectively convert the REE into water soluble chlorides. TG-DTA of NdFeB powder shows the commence of oxidation above 300°C. Further TG-DTA studies of NdFeB-NH_4Cl mixture corroborated with thermodynamic calculations indicates 300°C as suitable temperature for chloridizing roasting process to obtain the $NdCl_3$ and Fe_2O_3.