

Extraction and characterization of γ -Alumina from waste aluminium dross

ABSTRACT

Aluminium (Al) dross, a chemical waste from an aluminium production factory in Malaysia, was used in this study for the recovery of aluminium in the form of γ -Al₂O₃. The different methods, such as acid leaching, alkaline precipitation at different pH and calcination steps were successfully applied to extract the γ -Al₂O₃ from Al dross. The products were characterized by X-ray diffraction, atomic absorption spectroscopy, X-ray fluorescence, thermogravimetric analysis, Brunauer–Emmett–Teller surface area analysis, particle size distribution and field emission scanning electron microscope. The results revealed that the γ -Al₂O₃ powders recovered from the Al dross has crystallite size around 5 nm, specific surface area between 111 and 128 m²/g with different pore sizes. Thus, the present study illustrates an adequate utilization of the Al dross, which is, to date, neither adequately utilized nor properly dispensed in most of the developing countries.

Keyword: Aluminium dross; γ -Al₂O₃; Precipitation; Leaching