

## Abstract

# Impact of Red-Mud Recycling on Environment Sustainability

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The alkaline residue red-mud is generated at a rate of 120 million tons per annum from current day primary alumina refineries, total accumulation being 3 billion tons world-wide. Due to lack of commercial utilization, vast amounts of untapped residue are landfilled, discharged in water bodies. The research reported focuses on extraction of metallic values namely Iron, Aluminum and Titanium from Jamaican red-mud, thereby contributing to environment and resource sustainability. The hematite in red-mud was converted to magnetite using a gaseous reduction route. Optimum conditions for reduction achieved were: a processing temperature of  $540^{\circ}\text{C} \pm 10^{\circ}\text{C}$ , partial pressures  $\text{CO}(\text{g})$  and  $\text{CO}_2(\text{g})$  each of  $0.070\text{atm} \pm 0.001\text{atm.}$ / inert diluent-gas:  $\text{N}_2(\text{g})$ , for a conversion-time of 30min. Initial magnetic separation tests wet and dry on reduced magnetite are also reported.