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SUSTAINABLE ALUMINIUM STRATEGIES: UTILIZING DIASPORIC BAUXITE ORE AND BLACK DROSS FOR ALUMINA, ALUMINA-BASED CERAMIC AND SMELTING FLUX PRODUCTION

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ABSTRACT

Aluminium and its alloys, with superior mechanical properties and recyclability, are essential for industries such as transportation, construction, and packaging. Its recyclability supports sustainability by reducing greenhouse gas (GHG) emissions, energy consumption, and reliance on primary aluminium, making secondary aluminium production increasingly significant. However, the growing demand for aluminium highlights the need for innovative approaches to utilize industrial by-products. This study focuses on the development of sustainable and low-emission aluminium production using diasporic bauxite ore and black dross by improving efficiency. It highlights the evaluation of diasporic bauxite ore and black dross by pyrometallurgical and hydrometallurgical methods to produce alumina, alumina-based compounds and fluxes.