REE Potential in Carbonatite Deposits: A Case Study of Eppawala Carbonatite

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Rare earth elements (REEs) are currently the most strategic elements in the world due to their significance in the diversified technological applications. Currently, a total of 478 million tonnes of REE resources is disseminated across the world, which is dominated by the carbonatite deposits. The most common REE-bearing minerals found in carbonatites are bastnaesite, apatite, monazite, allanite and parisite. In this regard, the Eppawala carbonatite in Sri Lanka could be considered as a potential REE resource. The Eppawala carbonatite occurs in high-grade meta-sedimentary and igneous rocks of the Precambrian Wanni Complex as massive intrusions. In the Eppawala carbonatite, bed rock is mainly composed of calcite (~90%), dolomite (5-9%) and magnesite (accessory carbonate mineral), whereas chloro-fluor-hydroxyapatite, fluorapatite and carbonate-fluorapatite are present in a secondarily developed phosphate-rich regolith. The Eppawala carbonatite is enriched of REEs (~291-1962 ppm) with higher concentrations of LREEs. However, despite these evidences, only a few REE prospecting studies have been carried out in the Eppawala carbonatite. Therefore, detailed REE prospecting studies are recommended to discover the full potential of this prospect, followed by development of suitable REE extraction processes.

Keywords: Carbonatites, Eppawala carbonatite, Rare earth elements (REEs), Rare earth minerals, Sri Lanka

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