

## **Behaviour of major, trace elements and REE during basalt weathering in a tropical humid climate**

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Redistribution of elements in the weathering profile is largely modulated by climate and topography. Hence it carries valuable information about the climate, atmospheric composition and release of nutrients to hydrosphere. Two weathering profiles developed over Rajmahal basalt, situated within eastern part of the India, were investigated to understand the behaviour of elements during chemical weathering.

Removal of Na, Ca, Mg and Sr are significant in the profile, while Li, Rb, Cs and Ba are progressively enriched towards uppermost layers. Fe, Mn and Ce are precipitated into illuviation layer after released from primary minerals. Behaviour of Al and Ti are found to be immobile in the profile whereas Si shows maximum removal (12 – 30% of change) in the top layer. In the Si-Al-Fe ternary diagram, samples are plot in the kaolonitisation field, indicating intermediate stage of weathering. Unlike Deccan basalt in this study area, lateritic cap rock and soils are rare or thinly developed at few places representing a weathering limited landscape. However, these profiles are having potential to further undergo chemical weathering on silicate minerals and to draw CO<sub>2</sub> from the atmosphere.

Internal referenced REE pattern shows significant relative enrichment in LREE, notably in soil-saprolite, while HREE are depleted in the profiles. Negative anomaly (0.44) of Ce (Ce/Ce\*) in the middle and top layers is indicating preferential precipitation of Ce, along with Fe-Mn in oxic environment than La and Pr. As Eu<sup>2+</sup> incorporated to plagioclase in a reducing condition, positive correlation of Eu anomaly (Eu/Eu\*) with Ca in the profile indicates weathering of plagioclase. Gd shows minor positive anomaly (1.06) and shows a positive correlation with weathering indices. However, detailed investigation on Gd anomalies and the stabilities of different complex formed by REE in the upper layers of weathering profiles is in progress and will be discussed during presentation.