

## **Composition and distribution patterns of major and trace elements in gradually weathered andesite rock from FELDA Jengka 4, Pahang, Malaysia**

### **Abstract**

The composition of selected trace elements and major elements in gradually weathered andesite rock collected from FELDA Jengka 4, Pahang were determined using XRF technique. Eleven samples consisting of concentric layers from the weathered rock (outermost layer) to the fresh rock (inner layer) were obtained. The exfoliated layer, soil and fresh rock samples were pulverized for the determination of trace and major elements. For major elements the SiO<sub>2</sub> was the most abundant followed by Fe<sub>2</sub>O<sub>3</sub>, Al<sub>2</sub>O<sub>3</sub>, MgO and CaO. Other elements such as TiO<sub>2</sub>, MnO, Na<sub>2</sub>O, K<sub>2</sub>O and P<sub>2</sub>O<sub>5</sub> were present in amounts less than 1% content by weight. The percentage of SiO<sub>2</sub>, MgO and CaO decreased as the andesite layer gradually weathered, whereas the percentage of Fe<sub>2</sub>O<sub>3</sub> and Al<sub>2</sub>O<sub>3</sub> increased. In general, the concentration of trace elements in the most weathered layer was higher than their content in most fresh layer and soils. Correlation analysis showed that Co, Cr, Cu, and Pb negatively correlated at more than the 5% level of significance with MgO. Co, Cr, Cu, and Pb positively correlated at more than the 5% level of significance with Fe<sub>2</sub>O<sub>3</sub> and Al<sub>2</sub>O<sub>3</sub>. Some of the trace elements were positively correlated with each other indicating a similar favorable condition for their enrichment. Fe and Al became enriched as weathering progressed leading to the formation of more Fe and Al oxides and hydroxides in the weathered layer.