

Characterizing and Indexing regolith materials using geochemistry towards hidden mineral anomaly delineation: A case study of savannah region of NW Ghana

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As the discovery rate of world-class gold deposits continues to decline, increased attention is focused on geochemical exploration methods designed for regolith-dominated terrains. This involves mapping the regolith and classifying the mapping units into different regolith classes on the basis of weathering and geomorphic histories. The challenges of identifying some regolith mapping units in the field by novice in regolith mapping require the characterisation and indexing of regolith from major element geochemistry in the regolith profiles.

XRF analytical method was used to measure the weight % of the major oxides in regolith samples. The metal weight % of Mg, K and Al were calculated from their oxides and were normalised relative to immobile Al calculated from its oxide. The plot of Mg/Al and K/Al identified the regolith of the study area to consist of 137 transported clays, 4 ferruginous sediments or ferricrete, 2 lateritic duricrust and 4 saprolites.

Plot of Mg/Al and K/Al highlighted the compositional variability of the regolith samples and refute the notion of the homogeneity of all the sampled materials in the area. The study thus recognized Mg/Al versus K/Al plots to be used in supporting field identification of regolith mapping units particularly in complex regolith terrains of savannah regions of Ghana and in similar areas where geochemical exploration surveys are being carried out under cover.

Arhin, E. and Zango, M.S. 2015. Unravelling regolith material types using Mg/Al and K/Al plot to support field regolith identification in the savannah regions of NW Ghana, West Africa. *Journal of African Earth Science*, vol. 112, p. 597-607, Elsevier