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Geochemical evidence of the genetic relationships between gneissic host rock and gem minerals associated with pegmatite bodies in Lokoja, central Nigeria

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Field and geochemical studies of samples of gneissic host rock and NE-SW trending pegmatite dykes in Lokoja area, central Nigeria have been undertaken with a view to determining the genetic relationships between them and the associated tantalite, aquamarine and the REE. Trace elements enrichment patterns in the gneiss is Ba>Zr>Sr>Rb>Zn>Nb>Ga>Sb>Sc>Co>Sc while those in the feldspars are Ba>Zr>Sr>Pb>Rb. Muscovite flakes associated with the pegmatite dykes consist of Rb>Nb>Sn>Ga>Ta. Aquamarine and tantalite have enrichment patterns of Sc>Cs>Ga>Sb and Nb>V>W>Zn>Zr>Sc respectively. This study suggests that the mica gneiss is the possible host (progenitor) of the gem minerals that are enriched in the pegmatite dykes and that within the pegmatite bodies muscovite is more closely associated with gem mineralization than feldspars. The selective enrichment of trace elements in the pegmatite dykes suggests that the crystallizing fluid underwent rock-fluid interaction in which albitization was dominant.

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Probabilistic of slope failure and risk analysis in Sangun Mountains, Fukuoka Prefecture, Japan

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This paper deals with slope failure hazards and risk analysis of Sangun Mountains, Fukuoka Prefecture, Japan, using Geographic Information System (GIS) and remote sensing data. Slope failure locations in the study area were identified from interpretations of aerial photographs and field surveys. Topographical/geological data and airbone laser survey data (LiDAR data) were provided by local government in Japan. There are seven hundred slope failures inducing parameters which are considered for slope failure hazard analysis. These parameters are topographic slope, aspect, curvature and distance from drainage, all derived from the topographic database; geology and distance from lineament, derived from the geologic database; landuse from Landsat satellite images; soil from the remote sensing data and field investigation; Slope failure susceptibility was analyzed using slope failure-occurrence factors employing the probability-frequency ratio model. The results of the analysis were verified using the slope failure location data and compared with the probabilistic model. The accuracy observed will be analyzed. The qualitative slope failure hazard analysis was carried out using the frequency ratio model through the map overlay analysis in GIS environment. The accuracy of hazard map is important. Further, risk analysis will conduct by studying the slope failure hazard map and damageable objects at risk. This result could be used to estimate the risk to human activity, property and existing water management problem in catchment scale.