

OCCURRENCE OF RADIOACTIVE MINERALS IN A PEGMATITE INTRUSION IN RANDENIGALA AREA

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Interests in radioactivity as well as radioactive minerals are growing in Sri Lanka during recent years. Recent results of the radon mapping programmes as well as other radio nuclide monitoring programmes indicate that Sri Lanka has a significant amount of radioactive mineral resources. Finding and exploiting these resources may have a significant impact on our economy. This report is on an occurrence of highly radioactive minerals observed in a pegmatite intrusion near* the Randenigala reservoir. At certain points, ambient radiation was measured up to 400 CPM (about 0.4 mR/Hr). The radioactive mineral, which is glassy in appearance, has black colour on fresh surfaces and rusty yellowish brown on the exposed outer surfaces. The radioactive mineral has also caused pleochroic halos (radiohalos) altering the surrounding minerals. X-ray diffractograms show no significant peaks, confirming the lack of crystalline structure, despite extra-large grain size of the mineral. It is known that allanite often displays amorphous nature, due to radiation damage to its crystal structure. Physical properties, field observations as well as the associated mineral assemblages indicate that this mineral is allanite, which is commonly found in small quantities in several locations in Sri Lanka. Although the general composition of allanite is given as $(\text{Ce,Ca,Y,La})_2(\text{Al,Fe}^{+3})_3(\text{SiO}_4)_3(\text{OH})$, it is often enriched with thorium and other radioactive rare-earth elements, sometimes up to 20%.

Field observations indicate some branching of the pegmatite intrusion in the area, however, the occurrence of radioactive mineral was observed only at one location. Further investigations to understand the nature as well as the extent of these radioactive minerals will be useful.

Keywords: Radioactive minerals; Allanite; Pegmatite; Randenigala; Sri Lanka