

ZONED GRANITIC PEGMATITES IN ELAHERA AREA, SRI LANKA

A. PITAWALA

Department of Geology, Faculty of Science, University of Peradeniya

There are several occurrences of zoned granitic pegmatites at Elahera in the Polonnaruwa district of Sri Lanka. Those are steeply dipping, strongly-zoned, large bodies emplaced within Precambrian gneisses. One can identify five zones from rim to core on the basis of their mineralogy and texture, namely; a wall zone, an outer intermediate zone, a central intermediate zone, an inner intermediate zone and a core zone. Poorly developed allanite crystals and euhedral apatite and monazite crystallized primarily in the wall zone and the outer intermediate zone. Biotite, muscovite, hornblende, magnetite, ilmenite and tourmaline mainly occur in the central intermediate zone. The outer- and the central-intermediate zones are demarcated from other zones by graphic quartz-feldspar intergrowths. The inner intermediate zone is mainly made up of K-feldspar with subordinate plagioclase and fluorite. Fluorite grains are concentrated into small pods or lenses of this part. The core of the pegmatites is made up of pure quartz. However, inclusions of allanite within coarse-grained quartz of this zone are found at some localities.

Important suites of major and minor rock-forming minerals and rare-element-bearing accessory minerals provide evidence pertaining to internal fractionation of the pegmatite melt/fluid during crystallization. In the wall zone and the outer intermediate zone, the pegmatite melt/fluid evolved from a system enriched in rare earth elements (REEs), Ti, Th, P and U. The abundance of boro-silicates and the absence of phosphate minerals indicate that boron activity was high in the central intermediate zone. The involvement of fluorine enriched fluids may have resulted in the formation of fluorite in the outer core. The inner intermediate zone and the core of the pegmatite may have crystallized from fluids depleted in boron, REEs, Ti and P.

Presently, pegmatites in the area are being extensively mined for quartz and feldspar by villagers. As they do not have any knowledge on the zonation of pegmatites, their mining cost is high. On the other hand, they dump away all other mineral resources, which are also economically important.