

D-41: Mineralogy and chemistry of apatite found in the Sri Lankan Precambrian

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Mineralogical and chemical studies were carried out on 40 representative samples of apatite crystals collected from Eppawala phosphate deposit and other apatite bearing marble formations of the adjacent terrains, viz. Kadigawa and Galmaduwa (Anuradhapura District); Rattota and Weragama (Matale District); Ketawala, Thannelanda, Talatuoya and Digana (Kandy District). In and around Eppawala, greenish yellow apatite crystals were found in groundmasses of marble, pegmatite and secondary ferruginous aluminous matrices. These crystals were comparatively coarse (cm size) and they occurred in a groundmass of finer

apatite grains (mm size) associated with calcite, quartz, feldspar as major and magnetite, pyrite chalcopyrite as accessory minerals. In other locations, finer blue apatite grains (< 1 cm) were identified to be associated with calcite, dolomite, muscovite as major and pyrite, graphite, magnetite as accessories.

XRD studies revealed the presence of hydroxyl apatite as a major mineral in the crystals from Eppawala marble, pegmatite and the secondary matrix. The XRD patterns of the crystals were identical in all the samples studied from Eppawala. Fluor-apatite was the major component in the blue apatite grains of the marble formations. The total P_2O_5 content (by weight) varied from 39 - 40% for apatite crystals in Eppawala marble as well as in blue apatite grains. However, for crystals collected from the weathering profile at Eppawala quarry, the range was from 38.5 - 39% P_2O_5 . The slight decrease in P_2O_5 content could be due to leaching of phosphorus under tropical weathering conditions of Eppawala.

The occurrence of graphite associated with blue apatite, suggesting metasedimentary origins in some marble formations, was interesting in view of its absence at Eppawala.

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