**D-22: Mineralogy and chemistry of Eppawala apatite by X-ray diffractometry and X-ray fluorescence spectrometry**

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Detailed petrological and chemical studies were carried out on some phosphate samples collected from Eppawala which had formed by tropical weathering of apatite marble formation.Thus, representative samples of primary apatite, weathered secondary phosphatic matrix and Precambrian apatite marble rock were studied using X-ray diffractometry (XRD), X-ray fluorescence (XRF), and optical microscopy. Thin section observations showed that the weathering profile of Eppawala apatite consists of phosphatic ooids, pellets and intraclasts which occurred within stromatolitic groundmass. The apatite marble rock consists of primary hydroxyl apatite, calcite and silicate minerals such as muscovite and biotite in significant proportions. Rutile, magnetite, ilmenite, and spinel were found as accessories.

XRD studies revealed impurities such as quartz and calcite in primary apatite grains which were identified as hydroxyl apatite, chlor fluor hydroxyl apatite, carbonate hydroxyl apatite, and sodium magnesium apatite. The same minerals were shown by XRD and microscopic observations. The secondary phosphatic matrix showed the presence of hydroxyl apatite, carbonate apatite, chlor-fluor apatite, quartz and calcite. XRF analyses showed the presence of Ru, Sr, Cu, Hf, Fe, Ca, Cl, S and P in both primary apatite and secondary phosphatic matrix. However Zn, Mn and Ti were found only in the secondary matrix. The presence of Nb in primary apatite is significant.

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