

## **Synthesis and Characterization of Hydroxyapatite from Eppawala Rock Phosphate for Biomedical Applications as a Value Added Product**

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Eppawala chloroapatite deposit is the only commercially available phosphate source in Sri Lanka, which is situated in Anuradhapura district. In this study, it was chemically changed into hydroxyapatite as a value-added product. It is a bioceramic which can be used for applications in orthopedics and dentistry due to its structural similarity with the mineral phase of mammalian bones and teeth. Sol-gel approach was used to synthesize products using diluted Nitric acid under different conditions. Synthesized Eppawala hydroxyapatite powder was characterized using X-ray Fluorescence (XRF), X-ray powder Diffraction (XRD), Fourier-transform Infrared Spectroscopy (FTIR), and Scanning Electron Microscopy (SEM) in order to find out its composition, crystallinity, presence of functional groups, bonding type, surface morphology and microstructural features respectively. The FTIR spectroscopy results confirmed the formation of hydroxyapatite from apatite via the presence of hydroxyl groups. Those results coincided with the FTIR results of Human and Cow Bones. The XRD results reflected the formation of a hexagonal crystal structure of hydroxyapatite. Elementary composition and microstructural features of products were discussed based on the XRF and SEM results of the synthesized hydroxyapatite powder. The study concludes that there is a possibility of producing hydroxyapatite using commercially available Eppawala chloroapatite in Sri Lanka.

**Keywords:** Eppawala chloroapatite, Hydroxyapatite, Bioceramics