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## ABSTRACTS

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# *SOME OBSERVATIONS ON THERMALLY TREATED MIXTURE OF EPPAWALA APATITE AND MARBLE*

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The chemical compositions of primary apatite crystals found in the phosphate ore bodies as well as in the parent carbonatite bodies at Eppawala were analyzed. Powdered apatite crystals (100 mesh) and different weight proportions of powdered marbles (150 mesh) are mixed and heated at 650, 700, 750, 800 and 850 °C. The mineralogical changes were studied and available phosphate contents were measured on treated samples. Differential thermal analysis was carried out on each mixtures to observe possible endothermic and exothermic reactions.

Chemical analysis of Eppawala apatite shows that they are low in silicon, aluminum, strontium, iron and Rare Earth Elements (REEs). However, the fluoride concentrations in apatite are remarkably high. The XRD analysis shows that the changes of cell dimensions of apatite crystals was started at 700°C. New crystalline products are appeared in mixtures heated at 800°C and 850°C. Weight losses of apatite were noticed when the samples heated at 750°C. The water and citric acid solubility of apatite were gradually increased with increasing the temperature and the duration of heating. A weight ratio of apatite: marble, 10:15 at 850° C after four hours heating yielded a highest soluble product. Partial replacement of  $\text{PO}_4^{-3}$  in the apatite by  $\text{CO}_3^{-2}$  evolved from carbonate burning may have been the result in formation of a to form new crystalline phase in the system.

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