STUDIES ON THE EXTRACTION OF PHOSPHATE FROM EPPAWELA APATITE USING AQUEOUS ALKALINE SOLUTIONS

R. P. Gunawardane
(Dept. of Chemistry, University of Peradeniya)

The reaction of Eppawela apatite with Paranthan hydrochloric acid has been studied[1],[2] to produce a phosphate fertilizer. In the present study, extraction of phosphates from Eppawela apatite using aqueous alkaline solutions has been investigated.

The extraction was carried out using aqueous NaOH, KOH and Na_2CO_3 solutions in the concentrations ranging from 1M to 5M at temperatures from ambient to 85°C. Aqueous Na_2CO_3 solutions were found to be most effective while KOH solutions were least effective as an extracting agent. In all three cases, extraction efficiency was found to increase with increase in concentration. In the case of NaOH and Na_2CO_3 solutions, the optimum temperature for extraction was found to be around 60°C. 4– 5M Na_2CO_3 solution at 60°C gave the best yield (17.3 %wt. P_2O_5) of extractable P_2O_5, which is equivalent to about 55% of total P_2O_5 in apatite.

The crystallization of the alkaline phosphate extracts yielded crystals of a mixed salt, alkali phosphate carbonate, which could be used as a phosphate fertilizer.

References

1. Jayasekera, K. S., Tennakoon, D. T. B. *and* Gunawardane, R. P., *Proc. Sri Lanka Assoc. Advmt. Sci.*, 34 (1), 59 (1978)
2. Jayasekera, K. S., Tennakoon, D. T. B. *and* Gunawardane, R. P., *Proc. Sri Lanka Assoc. Advmt. Sci.*, 34, 60 (1978).