

A NITROPHOSPHATE FERTILIZER FROM
EPPAWELA APATITE

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Acidulation of Eppawela apatite with hydrochloric acid¹ and sulphuric acid² has been reported previously. It is of interest to investigate the possible use of nitric acid as an acidulating agent to produce a nitrophosphate fertilizer from Eppawela apatite. Nitrophosphates have an added advantage of possessing two important plant nutrients, nitrogen and phosphorus. In the present study investigations have been carried out to determine optimum conditions for the production of a nitrophosphate fertilizer from Eppawela apatite.

Finely powdered Eppawela rock phosphate samples were treated with nitric acid of different strengths at various ratios, mixed thoroughly and allowed to cure. Available and total P₂O₅ contents of the products were determined by the vanadomolybdate method. Nitrate contents also have been estimated using Cd reduction followed by colorimetry.

Maximum conversion has been observed with 70% nitric acid. Available P₂O₅ contents as well as nitrate contents increase with increase in the extent of acidulation. Completely (100%) acidulated samples contain 24.4% available P₂O₅ and 5.6% nitrate. On the other hand, 50% acidulated product contains 16.3% available P₂O₅ and 2.2% nitrate. 50-60% acidulated product contains higher total P₂O₅ content than the 100% acidulated product. The optimum curing period was found to be 3-4 weeks. Components containing other plant nutrients may also be admixed with the product before or after curing to obtain a mixed fertilizer.

As the cost of fertilizer increases with the increase in the extent of acidulation, partial acidulation appears to be more suitable for the production of nitrophosphate from Eppawela apatite especially in view of the fact that the partially (50-60%) acidulated product possesses reasonably higher contents of P₂O₅ and nitrate.

References:

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