Production of Syngenite As Slow Release Fertilizer

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Master (Msc) Thesis , 2004

Abstract

The manufacture of syngenite by using phosphogypsum reaction with potassium chloride in presence of ammonia, was selected to be the most reliable process. Thus, economic utilization of the massive solid waste of phosphogypsum as a cheap reactive source of calcium sulfate is attained. Experiments were carried out to study the effect of reaction time; concentration of ammonia solution; KCI to' ammonia solution volume ratio (V); KCI percentage excess and reaction temperature on the percentage conversion of syngenite produced were studied. Analysis of both liquid and solid phases has been carried out to manage product quality with X-ray diffraction technique referring to syngenite formation. The developed technology has proved its economic feasibility and reliability to manufacture syngenite (26.5 % K2O) on a commercial scale. The total product cost was found to be LE 740/ ton, which is highly competitive compared with the price of imported potassium sulfate (52.9 % K2O) which is LE 1800/tons. Finally, it was concluded that syngenite may be considered as a good source of potassium necessary for the Egyptian soil.

Keywords

Syngenite , Slow release , Potassium sulfate fertilizers ,