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## Research on the flotation of high-carbonate phosphate ores in Vietnam

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Vietnam is an agricultural country with the demands of a huge volume of fertilizers. Phosphate is one of main raw materials for producing fertilizers. Phosphate ores are vital non-renewable resources and essential components in pharmacy, cosmetics, and chemical industry. The manufacturing of agricultural fertilizers consumes about 90 % of the phosphate concentrate produced.

The continuously growing world population generates a need of increasing agricultural output which makes a long-term growth in phosphate production necessary. The demand on phosphate must be met through mining, beneficiation, and chemical processing of natural phosphate rock. With the depletion of easy-to-treat siliceous phosphate resources, low quality phosphate ores with high impurities have to be exploited for application.

Carbonates (calcite & dolomite) are considered the most problematic ones among the impurities associated with phosphate. They are causing sulfuric acid consumption in acidulation of phosphate rock, increase  $P_2O_5$  loss, increase fluid viscosity, which lowers filtration rates when separating solid gypsum crystals from the valuable phosphoric acid.

Separating carbonate impurities from phosphate has long been recognized as one of the most challenging subjects in phosphate ore beneficiation because of their similarities in physical and chemical properties. Therefore, separation of such minerals from each other is a difficult problem and it requires very highly selective collectors and suitable reagent regimes.

This research is focused on investigation effect of parameters such as the pH, pulp density, particle size, collectors, depressants, modifiers, etc. In addition, the hydrodynamics conditions are to be improved for flotation of high-carbonate phosphate ores in Vietnam. At the end a suitable reagent regimes is to be found to remove carbonate from phosphate ores using single direct or reverse flotation or a combination of it.