

ABSTRACT

THE INFLUENCE OF PHOSPHATE ROCK ACIDULATION WITH TOFU INDUSTRY LIQUID WASTE AND ACID SOLVENT AND INCUBATION DURATION TO SOLVED PHOSPHATE

By

NIA INDAH WORO

Phosphate rock is the raw material for making P fertilizer industry (super phosphate fertilizer). Process of making super phosphate fertilizer from phosphate rock is commonly through acidulation process; a process involving strong acid compound to solve strongly bound phosphate to the phosphate rock. This process requires a high cost because of the use of strong acid, so that super phosphate price is expensive. Cheaper alternative solvent should be sought such as using tofu liquid waste for phosphate rock acidulation. The objective of this research is to evaluate tofu liquid waste potential to solve P from phosphate rock from two different locations with different content of P_2O_5 compared with conventional acid. The results of this research will be used as a basic to design P fertilizer industry from local phosphate rock with tofu liquid waste solvent with cheaper production cost.

This research was composed in factorial 4 x 2 in randomized group design and three repetitions (group). This research was conducted in laboratory of Soil Science in Lampung University and Lampung State Polytechnique from September to December 2011. Observations were conducted 4 times in day 1, 30, 60, and 90 after incubation (soaking). Data were analyzed using analysis of variance with significant level of 5% and middle value difference of treatment was tested using Least Significant Difference at significant level 5% to main variable solved-P. Main variable (P-solved) was correlated with supporting variables (pH and P-total).

The results showed that tofu liquid waste was able to solve P from phosphate rock, but it's potential was lower than conventional solvent acid. Phosphate rock from Selagai Lingga (high P_2O_5) produced higher solved-P than phosphate rock from Sukabumi (low P_2O_5) in all types of solvents. Selagai Lingga phosphate rock with sulphate acid solvent produced highest solved-P in 30 days incubation with value of 14.70%, while tofu liquid waste solvent with Selagai Lingga phosphate rock produced solved-P with value of 11.75%. Solved-P produced by sulphate

acid and tofu liquid waste did not yet fulfill standard requirement of qualified phosphate fertilizer (SNI), but it fulfilled requirements as a good natural phosphate quality A, B, and C.

Keywords: natural phosphate rock, tofu industry liquid waste, acid solvent, P fertilizer, solved-P.