

# STABILIZATION OF COPPER AND CADMIUM OXIDES IN THE CaO-SiO<sub>2</sub> SOLID SYSTEM

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## ABSTRACT

This research was conducted to study the characteristics of the CaO-CuO-SiO<sub>2</sub> and CaO-CdO-SiO<sub>2</sub> composites in the stabilization of Cu and Cd metals and to determine the mole percentages of Cu and Cd metals retained in the composite where the precursor CaO comes from eggshells, while SiO<sub>2</sub> comes from reed plant.

This research was initiated by synthesizing composites using the solid state reaction method. The synthesized compounds were then hydrated with various immersion times of 30, 60, and 90 days with the aim of adsorbing Cu and Cd metals in the composite crystal structure. The stabilization of CaO-CuO-SiO<sub>2</sub> and CaO-CdO-SiO<sub>2</sub> was tested using the TCLP method. The mole percentages of Cu and Cu after the TCLP test were calculated from the leached metal concentrations.

Composite characterization results show that the main constituent compounds are Ca<sub>3</sub>SiO<sub>5</sub>, Ca<sub>2</sub>SiO<sub>4</sub>, Ca(OH)<sub>2</sub>, SiO<sub>2</sub>, as well as metal oxide compounds CuO and CdO with a crystal structure in which each constituent element is spread homogeneously. The composite can adsorb heavy metals with stabilization of Cu and Cd in the composite showing a percentage of 99.99999%, or proximately 100%.

Kata Kunci: *Stabilization, TCLP, calcium silicate, heavy metals, hydration.*