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COMPRESSIVE STRENGTH/ LEAD AND NICKEL LEACHING

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NICKEL LEACHING FROM HEAVY METAL SLUDGE SOLIDIFIED BY CEMENT AND
RICE HUSK ASH. THESIS ADVISORS : PISIT VATANASOMBOON, M.Sc.(Env. Health).,
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This research was conducted to investigate compressive strength and lead and nickel leaching from heavy metal sludge solidified by cement and rice husk ash. The heavy metal sludge was collected from an electroplating industry. The experiments were performed by using these conditions : the sludge waste to cementious binder ratios of 0.3, 0.65 and 1.0; the curing times of the solidified specimens for 3, 7 and 14 days; and the pH of the extracted solution at 5, 7 and 9.

The results indicated that the increase of the sludge waste to cementious binder ratio resulted in lower compressive strength. Increase in the compressive strength was observed with longer curing times of the solidified specimens. It was also found that the most appropriate ratio for the solidification was the sludge waste to cementious binder ratio of 1.0. The compressive strength of specimens produced with every ratios conformed to the solidified waste standard promulgated by the Ministry of Industry. For the leaching test, there was no significant difference ($P\text{-value} = 0.185$) observed among the concentrations of lead with the increase of the sludge waste to cementious binder ratios. Increase in the amount of lead was observed at longer curing times and at lower pH of the extraction solution ($P\text{-value} < 0.001$). Significant increase of the nickel concentrations ($P\text{-value} < 0.001$) were found at higher ratios of the sludge waste to cementious binder, and inversely the concentrations were significantly decreased ($P\text{-value} < 0.05$) with longer curing times and the higher pH of the extraction solution. The concentrations of both metals at all conditions were lower than the toxic substance standard ($< 5 \text{ mg/l}$).