



CHEMICAL DURABILITY EVALUATION OF MORTAR DOPED WITH DEPLETED URANIUM

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ABSTRACT

Depleted Uranium (DU) is uranium with a lower content of the fissile isotope ²³⁵U than natural uranium. DU can be formed as waste from the enrichment process and/or can be obtained during the reprocessing process from spent fuel. Recent studies have shown that DU can be used as a mixture to increase the durability of the materials. This research gives the characteristics of cement doped by DU in demineralized water.

The research used the leaching test method with demineralized water with a pH between 5.3 and 5.7. The pH value will be measured every time the sample is taken. The liquid sample that has been taken will be analyzed with Ion Chromatography, Inductively Coupled Plasma – Mass Spectrometry, and Gamma Spectrometry. The liquid waste from the container specimen will be filtered to take the precipitate to be characterized with Fourier Transform Infrared Spectroscopy and X-ray diffraction.

The experiment showed the leaching solution stabilized at a pH of around 12. The liquid analysis also indicates there are elements released from the specimen such as calcium, potassium, sodium, strontium, aluminum, iron, silica, and sulfate. Uranium is also released from CEM-II doped with depleted uranium specimens. Solid characterization using FTIR and XRD has coherent results with the liquid analysis which indicates the precipitate has sulfate, carbonate, and Si-O-Al bond in it.

Keywords: Depleted Uranium, CEM-II, Leaching test.

