

Leaching Properties of Phosphate Rocks in the Nile River

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Abstract : Phosphate Rocks (PR) are natural sediment rocks. These rocks contain several chemical compositions of heavy metals and radioactive elements. Mining and transportation these rocks beside or through the natural water streams may lead to water contamination. When PR is in contact with water in the field, as a consequence of precipitation events, changes in water table or sinking in water streams, elements such as salts and heavy metals, may be released to the water. In this work, the leaching properties of PR in Nile River water was investigated by experimental lab work. The study focused on evaluating potential environmental impacts of some constituents, including phosphors, cadmium, curium and lead of PR on the water quality of Nile by applying tank leaching tests. In these tests the potential impact of changing conditions, such as phosphate content in PR, liquid to solid ratio (L/S) and pH value, was studied on the long-term release of heavy metals and salts. Experimental results showed that cadmium and lead were released in very low concentrations but curium and phosphors were in high concentrations. Results showed also that the release rate from PR for all constituents was low even in long periods.

Keywords : leaching tests, Nile river, phosphate rocks, water quality

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