

A Study on Leaching of Toxic Elements of High Strength Concrete Containing Waste Cathode Ray Tube Glass as Coarse Aggregate

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Abstract : The rapid advance in the electronic industry has led to the increase amount of the waste cathode ray tube (CRT) devices. The management of CRT waste upon disposal has become a major issue of environmental concern as it contains toxic elements (i.e. lead, barium, zinc, etc.) which has a risk of leaching if it is not managed appropriately. Past studies have reported regarding the possible use of CRT glass as a part of aggregate in concrete production. However, incorporating waste CRT glass may present an environmental risk via leachability of toxic elements. Accordingly, the preventive measures for reducing the risk was proposed. The current work presented the experimental results regarding potential leaching of toxic elements from four types of concrete mixed, each comprising waste CRT glass as coarse aggregate with different shape and properties. Concentrations of detected elements are measure in the leachates by using atomic absorption spectrometry (AAS). Results indicate that the concentration of detected elements were found to be below applicable risk, despite the higher content of toxic elements in CRT glass. Therefore, the used of waste CRT glass as coarse aggregate in hardened concrete does not pose any risk of leachate of heavy metals to the environment.

Keywords : recycled CRT glass, coarse aggregate, physical properties, leaching, toxic elements

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