

Chromium-Leaching Study of Cements in Various Environments

Authors : Adriana Estokova, Lenka Palascakova, Martina Kovalcikova

Abstract : Cement is a basic material used for building construction. Chromium as an indelible non-volatile trace element of raw materials occurs in cement clinker in the trivalent or hexavalent form. Hexavalent form of chromium is harmful and allergenic having very high water solubility and thus can easily come into contact with the human skin. The paper is aimed at analyzing the content of total chromium in Portland cements and leaching rate of hexavalent chromium in various leachants: Deionized water, Britton-Robinson buffer, used to simulate the natural environment, and hydrochloric acid (HCl). The concentration of total chromium in Portland cement samples was in a range from 173.2 to 218.5 mg/kg. The content of dissolved hexavalent chromium ranged 0.23-3.19, 2.0-5.78 and 8.88-16.25 mg/kg in deionized water, Britton-Robinson solution and hydrochloric acid, respectively. The calculated leachable fraction of Cr(VI) from cement samples was observed in the range 0.1--7.58 %.

Keywords : environment, cement, chromium, leaching

Conference Title : ICEET 2016 : International Conference on Civil, Environmental Engineering and Technology

Conference Location : Toronto, Canada

Conference Dates : June 13-14, 2016