Trent University
Chemistry/Physics Seminar Series

Dr. Shannon Hill
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Wednesday, February 15, 2017
11:00 a.m. to 11:50 a.m.
Science Complex Room 115

The Corrosion of Carbon Steel under Deep Geologic Nuclear Waste Disposal Conditions

The proposed disposal scenario for high-level nuclear waste in Canada is emplacement within a sealed, deep geological repository (DGR) located in either granitic rock or sedimentary clay. Disposal is based on a multi-barrier approach, with the primary barrier being a sealed container which could be either dual-walled with a copper shell over an inner carbon steel vessel for granitic rock or a single thick-walled steel container for sedimentary clay. This study focused on the corrosion behaviour of A516 Gr70 carbon steel as well as the corrosion products formed in a variety of groundwater compositions and concentrations expected within a sedimentary clay DGR environment. In particular, the effects of groundwater anions such as Cl^-, HCO_3^-/CO_3^{2-}, and SO_4^{2-} on the corrosion behaviour and corrosion product compositions and morphologies were studied. Several electrochemical and surface characterization techniques were employed to investigate the corrosion behaviour of the steel as well as the identities and morphologies of the subsequent corrosion products.

All Welcome!