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The Corrosion of Copper Nuclear Waste Containers under Deep Geologic Disposal Conditions^F

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The corrosion of high level copper nuclear waste containers under permanent disposal conditions can occur via a number of processes which change in importance as the environment within a deep geologic repository evolves from warm and oxic to cool and anoxic. Under warm and oxic conditions the container could be exposed to gamma irradiated conditions which evolve from aerated vapour to fully saturated aqueous conditions. During this period the possibility of localized corrosion (e.g., pitting) must be considered. Over extended exposure periods when anoxic conditions prevail corrosion will be sustained by reaction with sulphide produced either by remote microbial activity or the dissolution of sulphides present in the clays compacted around the container. Studies to understand and quantify both these corrosion processes are underway. In this presentation these studies will be discussed and their use in the development of corrosion models described.

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