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## **Corrosion morphology of copper in anoxic sulphide environments implications for long term storage of spent nuclear fuel.**

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Copper coupons have been exposed to H<sub>2</sub>S (g) and sulphate reducing bacteria (SRB) in order to examine the magnitude of corrosion and the corrosion morphology of copper in these sulphide environments. In each environment, four different exposure conditions were tested; low and high partial pressures of H<sub>2</sub>S gas for 10 and 30 days in each, and; minimal and rich growth media with SRB for 10 and 30 days each.

The results of the analyses show that the extent of corrosion increases with the partial pressure of H<sub>2</sub>S (g), and the richness of the SRB growth medium, as well as the duration of exposure. Inspection of the shape and morphologies as well as statistical analysis of the deepest pits and defects found on the exposed coupons suggested that these are not related to the corrosion exposures but that most of them are due to different types of mechanical damage and wear that occurred before or during preparation of the coupons (cutting and polishing).

During the course of the present work a method of evaluating the mass loss due to corrosion (pickling) was developed as the original method of removing corrosion products with a combination of alkaline (20 Wt% NH<sub>4</sub>OH) and acidic (37 Wt% HCl) solutions was deemed to have affected pits on the surface of the coupons and thus compromised the accuracy of the pit measurements.