Mechanisms of Copper Corrosion in Aqueous Environments

Moderator

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Fundamental Question

WILL COMMERCIALLY PURE COPPER CORRODE IN ANOXIC WATER?

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Questions

- What are the relevant reactions?
  - (a) thermodynamic support
  - (b) kinetic support
- What would be the corrosion products and damage morphology?
- What are the role(s) of dissolved species in the water?

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Questions (cont)

- If it is relevant, what will be the rate of corrosion?
  - (a) Decreasing with time?
  - (b) Constant with time?
  - (c) Increasing with time ?
- What is the relevance to long term geologic disposal of nuclear waste in containers with a copper overpack?
- Can corrosion rates be predicted and, if so, what will be the lifetime of copper clad containers in the anticipated repository environment?

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Workshop Goals -I

If the question of copper corrosion in anoxic water, of any relevant chemistry, cannot be resolved at this time, what would have to be done to instill confidence that nuclear waste can be successfully and safely emplaced in a deep geological repository?

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Workshop Goals -II

1. Attempt to resolve the data and relevant science on which there is substantial agreement
2. Identify those area where consensus is not yet reached and propose paths forward

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Panel

- Gok Khuan Chuoh – National University of Singapore
- Ronald Latanision – USNWTRB and Exponent
- Digby MacDonald - Pennsylvania State University
- David Shoesmith – University of Western Ontario

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