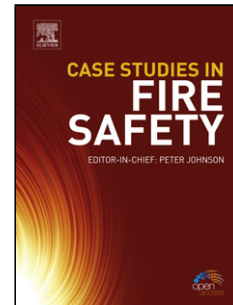


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## **An Atom Probe Tomography Study of Pb-Caustic SCC in Alloy 800**

**S.Y. Persaud<sup>1,2</sup>, J.M. Smith<sup>2</sup>, B. Langelier<sup>3</sup>, B. Capell<sup>4</sup>, and M.D. Wright<sup>2</sup>**

**<sup>1</sup>Department of Mechanical and Materials Engineering, Queen's University, Nicol Hall, 60 Union Street W, Kingston, ON, K7L 2N8**

**<sup>2</sup>Canadian Nuclear Laboratories, 286 Plant Road, Chalk River, ON, K0J 1J0, Canada**

**<sup>3</sup>Canadian Centre for Electron Microscopy (CCEM), McMaster University, 1280 Main Street West, Hamilton, ON, L8S 4M1, Canada**

**<sup>4</sup>Electric Power Research Institute (EPRI), 1300 West WT Harris Blvd., Charlotte, NC, 28262, USA**

Corresponding authors, E-mail addresses: suraj.persaud@queensu.ca (S.Y. Persaud), jared.smith@cnl.ca (J.M. Smith), Tel.: +1613-533-6000 ext. 74015.

### **Highlights**

- APT was used to characterize crack tips in Alloy 800 after exposure to Pb-caustic solution.
- Three-dimensional characterization combined with sub-nanometre scale elemental sensitivity allowed identifying oxides present in the crack.
- APT allowed for quantification of Pb at oxide-metal interfaces, suggesting Pb deposition on Ni-rich regions.
- APT identified local chemistry and transport of ppt-level impurities to the base of crack tips.
- Local crack tip chemistry from APT complemented prior TEM characterization, supporting a film-rupture/de-alloying SCC mechanism.

### **Abstract**

Stress corrosion cracking (SCC) of Alloy 800 was induced in 330 °C Pb-caustic solution (pH<sub>330°C</sub> 9.5). These laboratory tests simulated extreme crevice environments in nuclear plants, but do not

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