Fracture of Oxide Glasses

FIELDS OF APPLICATION

- Glasses for daily use to high technology
- Preservation of historical glasses
- Containment vessels for nuclear materials
- …

INFORMATIONS OBTAINED

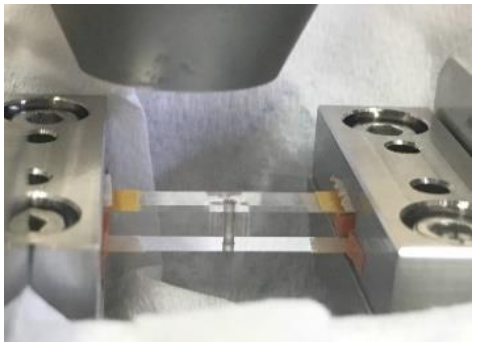
- Holistic viewpoint of Stress Corrosion Cracking
- Characterization of Stress Corrosion Cracking behavior: Velocity as a function of stress intensity factor curves
- Fracture properties
- Linking different properties of glasses
- Moduli & Poisson's ratio
- Post mortem analysis of fracture surfaces to understand how the systm failed.

GENERAL PRINCIPLE

Glass systems undergo a variety of damage (consumer use, sand storms, external irradiations, high temperatures…) which can lead to premature failure and/or alterations of their physical and mechanical properties.

To understand the failure mechanism in hopes to ultimately prevent failure, we developed **innovative setups** and **analysis methods** to:

- determine standard **mechanical properties** (Young modulus, Poisson ratio, toughness…),
- access the underlying damage mechanisms at the **relevant scales**,
- and **characterize** the sub-critical (stress corrosion cracking) to dynamic fracture behavior of oxide glasses.



Experimental setup of sub-critical crack growth in oxide glasses

Image of sub-critical crack growth in an oxide glasses

TECHNOLOGY CARD

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