



SELF-SEALING CAPACITY OF WELLBORE CEMENT UNDER GEOLOGIC CO₂ STORAGE

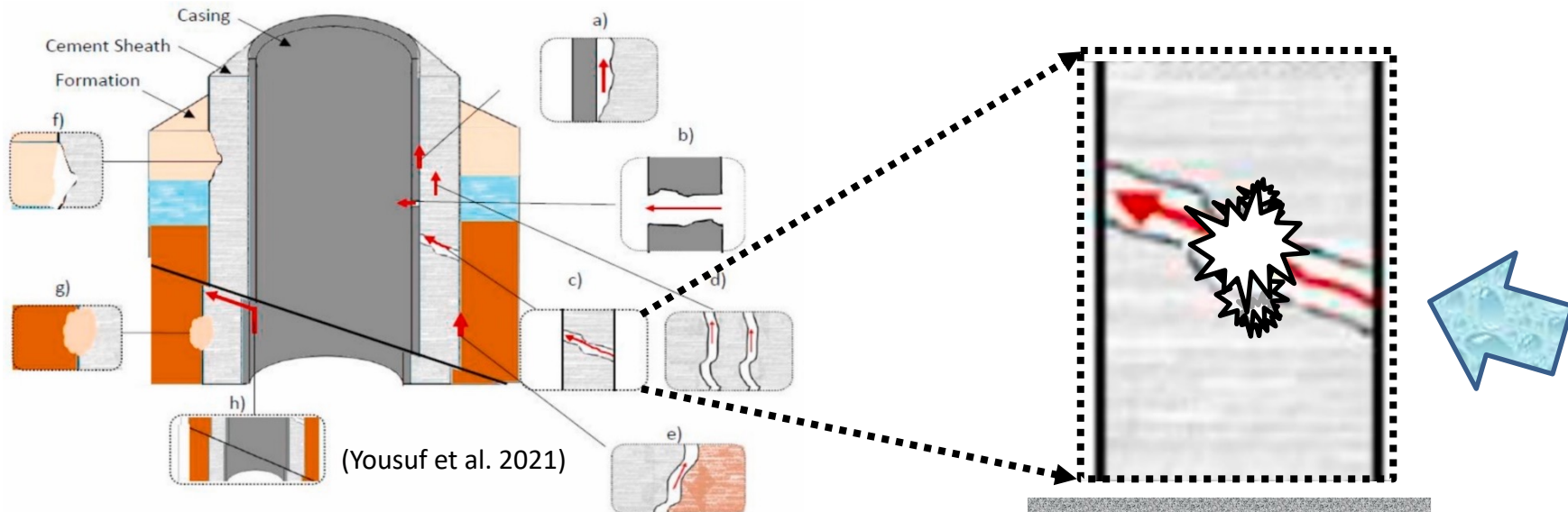
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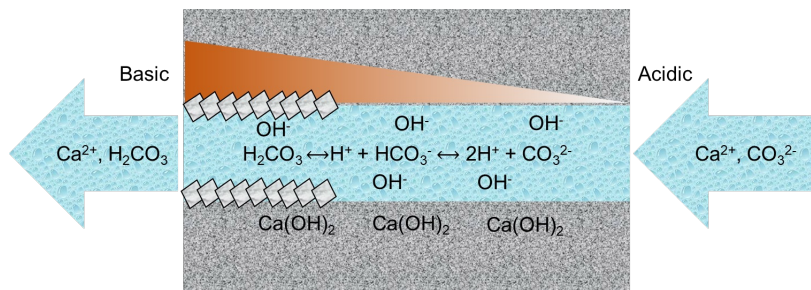
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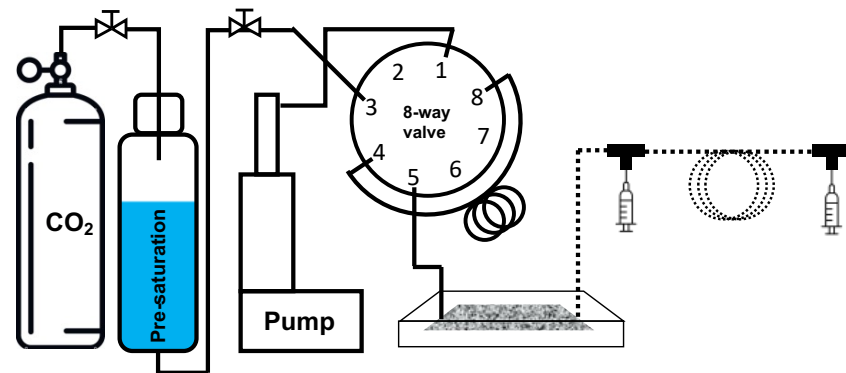
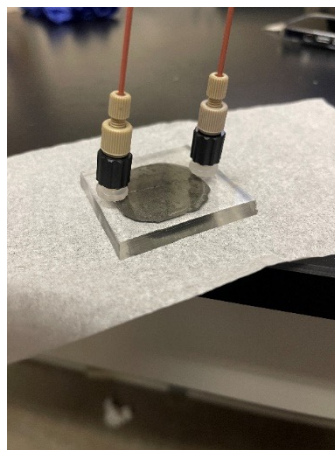
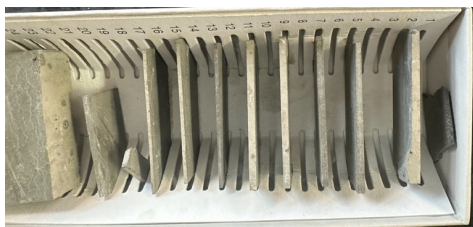
Self-sealing of Cracks in Cement by CO₂ Saturated Brine



- In geologic sequestration of carbon dioxide, preexisting **wellbores are considered a primary leakage potential**
- Self-sealing of cracks in the cement can be achieved by CO₂ saturated brine via dissolution of cement materials and precipitation of secondary minerals.
- ***This may reduce the aperture size of fractures or even clog up fractures to reduce leakage***



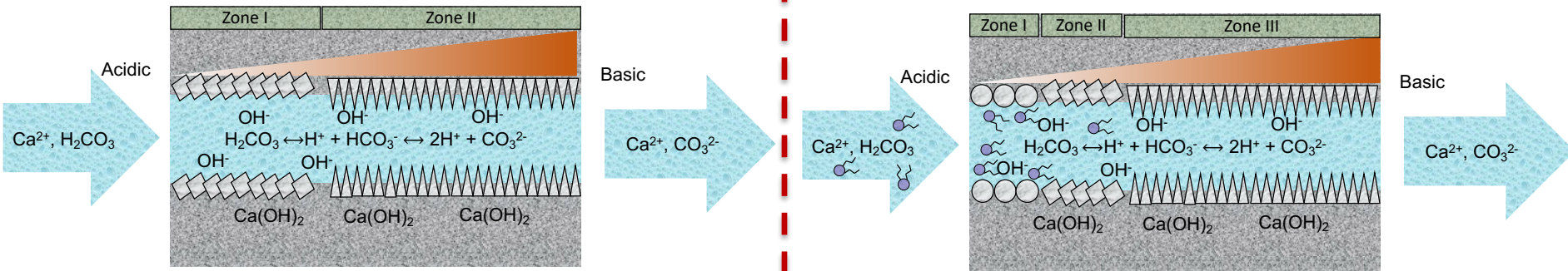
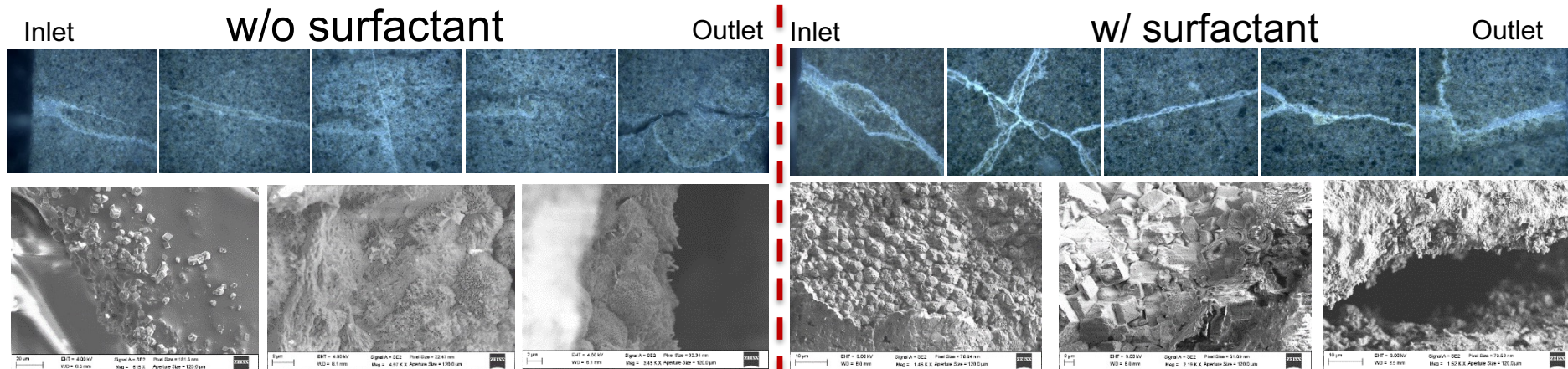
Flow Cell Containing Cement Sample and Flow Test Experiments



- Cure Bulk Class H Portland Cement (Wellbore Cement) in anaerobic conditions to avoid carbonation
- Cut, polished and encapsulated within PDMS, mechanically fractured and connected to flow system

- CO₂ is dissolved in water in pre-saturation reactor then pumped through flow cell and effluent is collected.

Results and Effects of Presence of Surfactant



- Surfactant can prevent recoalescence of precipitates which may interrupt self-sealing capacity of wellbore cement

Thank you!