**Grand Challenge**

Enable clean production of fossil fuels through efficient recovery and processing of hydrocarbons with minimal overall carbon emissions.

- CO₂ as an EOR process fluid.
- CO₂ sequestration in depleted reservoirs.

Interfacial phenomena under reservoir conditions are crucial for such processes.

**Objective**

Measurements of partially miscible phases containing CO₂ at elevated pressures and temperatures.

1. Interfacial Tensions, \( \gamma \)
2. Contact Angles, \( \theta \)

**Pressure vessel**

Condition range: 0.1 MPa < \( p \) < 70 MPa

291 K < \( T \) < 473 K

- Sapphire windows
- PTFE ring

**Drop Shape Analysis**

\[ \Delta \rho_{\text{apex}} - \Delta \rho_p = z \Delta \rho_g \]
\[ \Delta \rho_{\text{apex}} = 2 \gamma k_{\text{apex}} \]
\[ \Delta \rho_p = \gamma (k_{1p} + k_{2p}) \]

where,

\[ k_{1p} = \frac{d\Phi}{ds} \]
\[ k_{2p} = \sin\Phi / x \]

**H₂O / CO₂**

Literature Data

**References**


**Acknowledgments**

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