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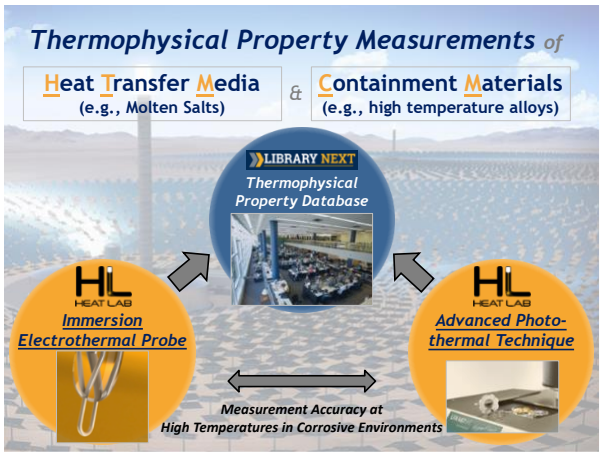
Challenges with High Temperature Thermophysical Property Measurements.

1. Impact

Insufficient thermophysical property measurements have been performed to enable Gen3 CSP systems. New techniques have now been developed & data are curated in a publicly accessible online database (gen3csp.gatech.edu/).

2. Project Goal



3. Method(s)

- Innovative immersion electrothermal probe technique capable of measuring thermal properties of molten salts HTM up to 850°C.
- Modified flash diffusivity technique capable of measuring thermophysical properties of CMs up to 1200°C.

4. Outcome(s)

- Publicly accessible online thermophysical property database for particulate HTMs, metal alloys, ceramics (up to 1200°C), including error-analysis and propagation.
- Aging studies on the thermal properties of Ni alloys & particulate HTM are on-going.

5. Conclusion/Risks

- Molten salts are very challenging.
- Ni alloys exhibit high temperature phase transition not captured in supplier sheets.
- High temperature oxidation, corrosion, or sublimation limit use (*e.g.*, granite foams).
- Data discrepancies with supplier sheets exist.
- Knowledge gaps in high temperature thermophysical property data filled.
- Confidence in measuring thermophysical properties accurately and precisely.

6. Team

- Shannon K. Yee, PhD (PI)
- Andrey Gunawan, PhD (Co-PI)
- Bettina Arkhurst & Sonja Brankovic (Grad students)
- James Ponder, PhD & Michael Adams, PhD (Postdocs)