INL/MIS-22-68040-Revision-0

MSR campaign PuCl3-NaCl density two slides

April 2023

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Changing the World's Energy Future

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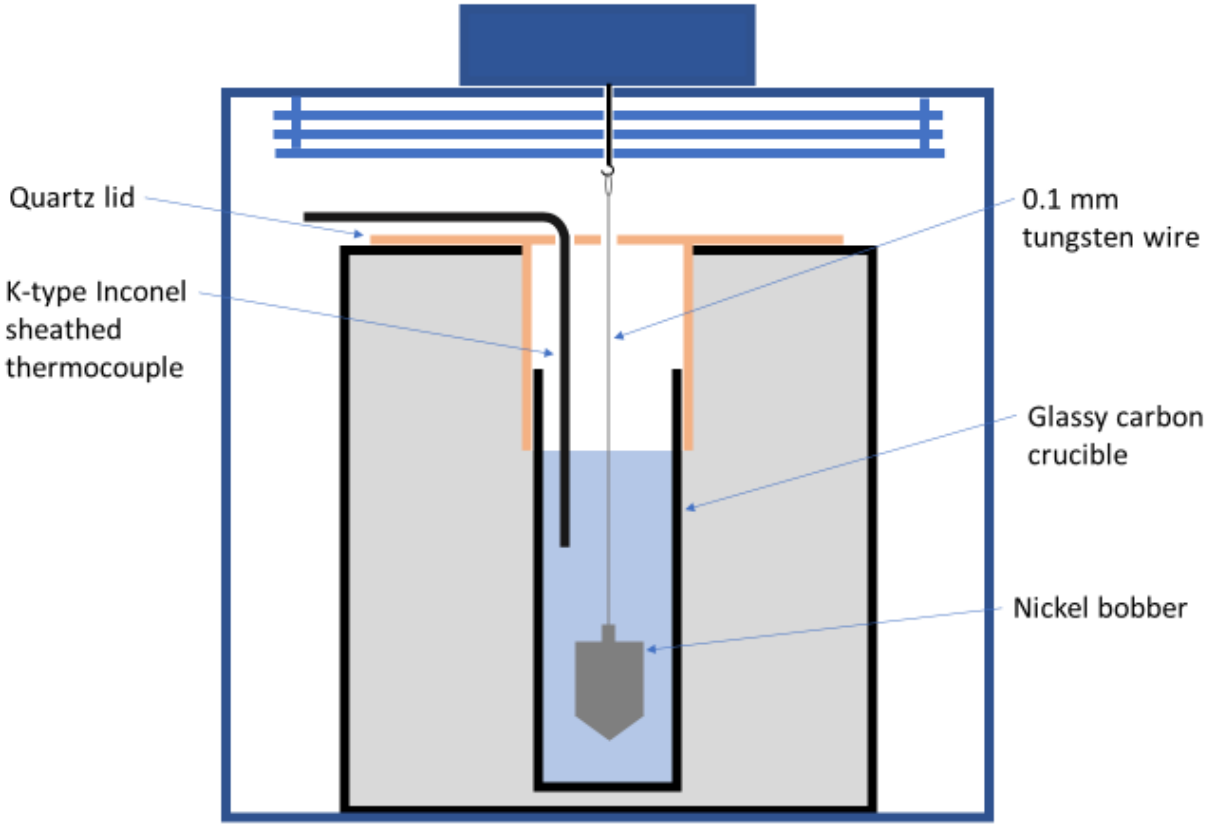
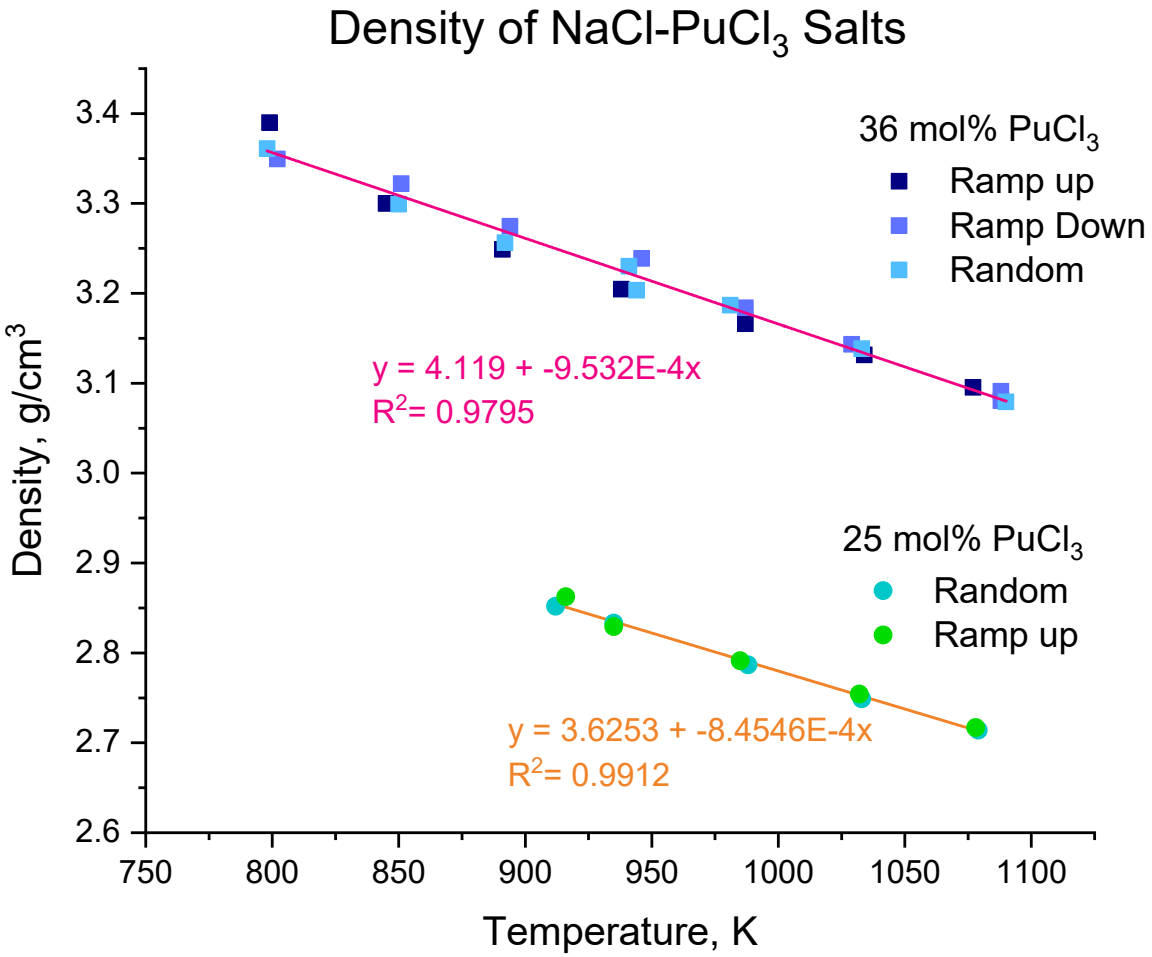
Density of $PuCl_3$-NaCl mixtures

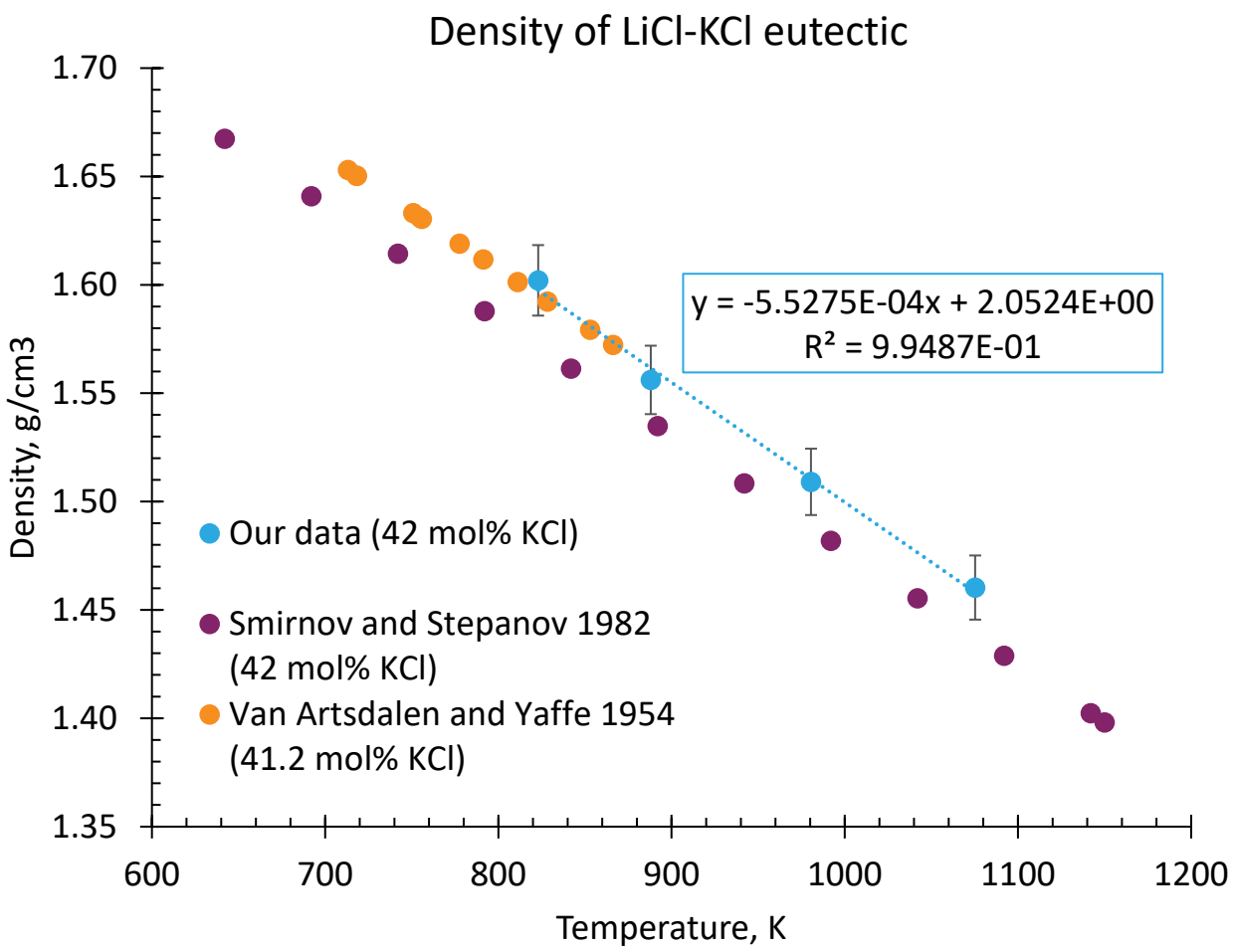


- Archimedes' hydrostatic method
- 5 mass measurements per temp
- Heating, cooling, randomized cycle

$$\rho_{salt} = \frac{M_{air} - W_{salt}}{V_0(1 + 3 \propto (T - T_0))}$$

Density of $PuCl_3$-NaCl mixtures





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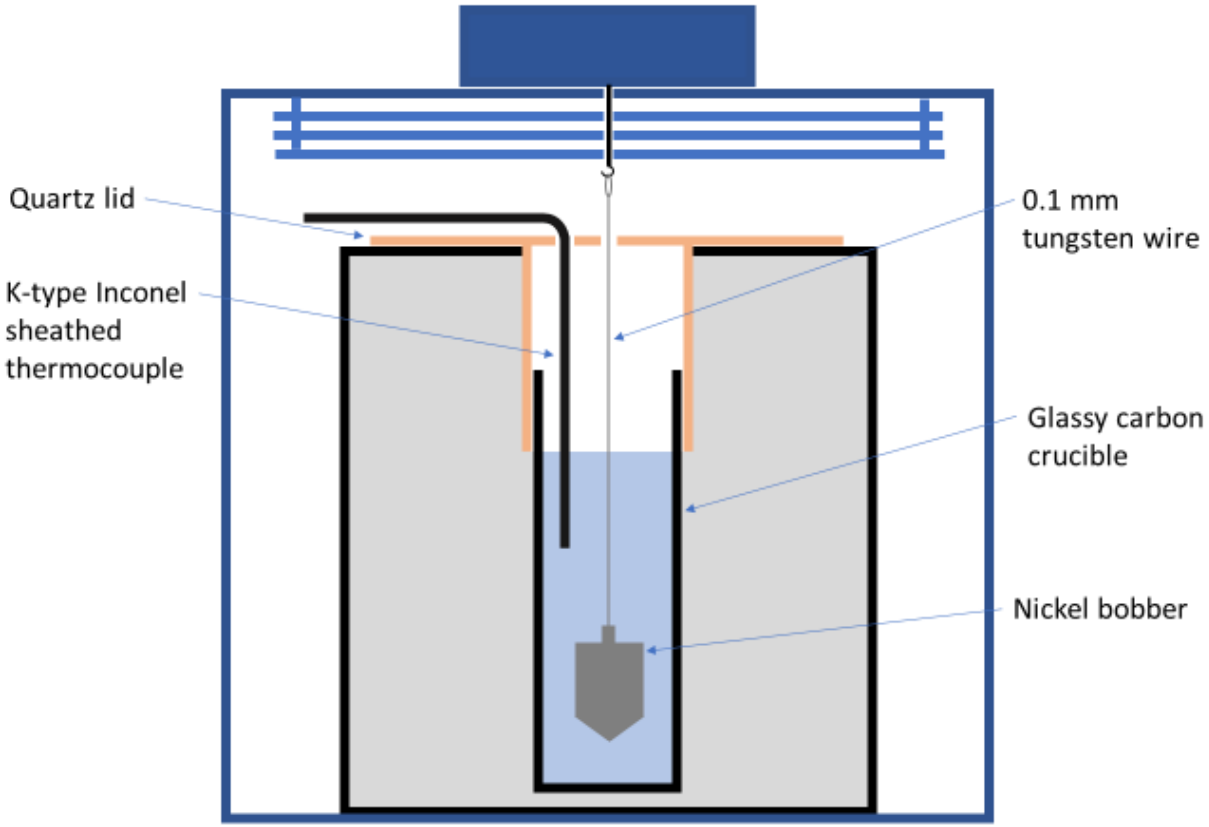

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$$\rho_{salt} = \frac{M_{air} - W_{salt}}{V_0(1 + 3 \propto (T - T_0))}$$

$$\frac{\pi D \gamma}{g}$$

$$V_0 + \Delta V = (L_0 + \Delta L)^3$$
$$= L^3 + 3L^2\Delta L + 3L\Delta L^2 + \Delta L^3$$

$$D = 0.01\ cm$$

$$\gamma \sim 0.120 \frac{N}{m}$$

$$g = 980.7\ \mathrm{cm/s^2}$$

$$\frac{\pi D \gamma}{g} = 0.00384\ g$$