Design of Complex Fluid Electrical Conductivity Cell

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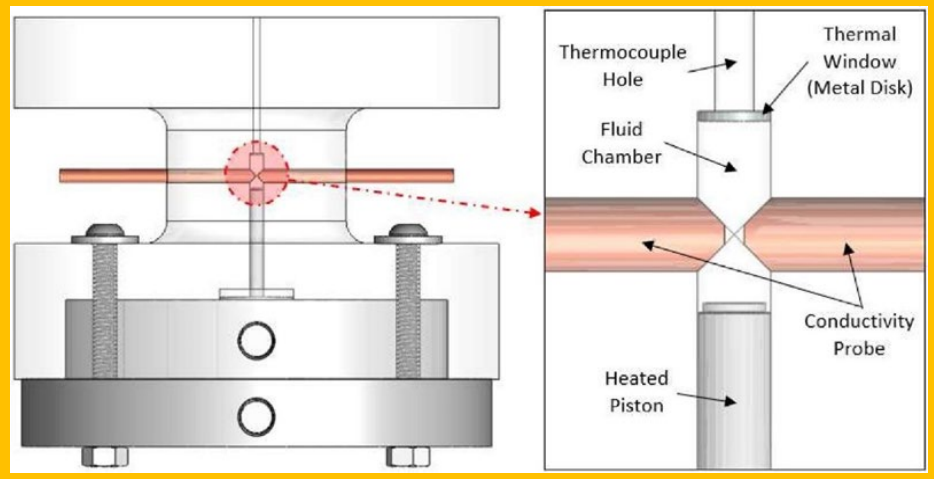
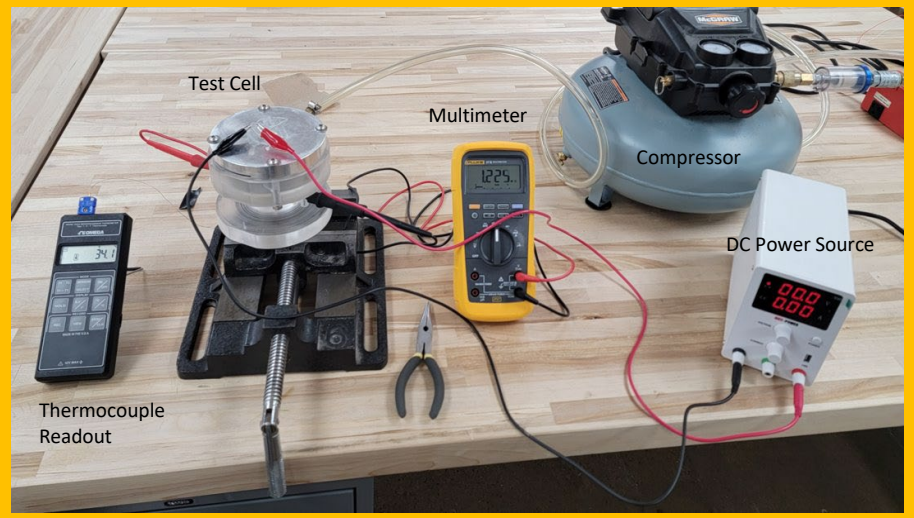
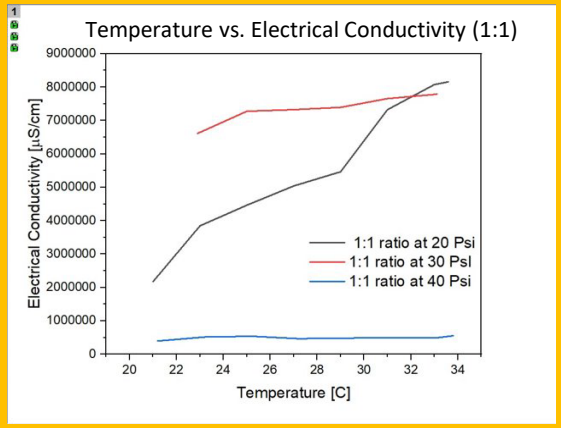
Overview: The electrical conductivity of a nanofluid can change when pressure or heat are applied. This unique property of nanofluids is already being utilized in a few systems such as smart shocks. We were tasked with improving on a previous project by taking an existing conductivity test cell capable of pressurizing a nanofluid to 500 MPa and adding the ability to heat the fluid. This allows us to observe the effects of both heat and pressure on the fluid using the same test apparatus.

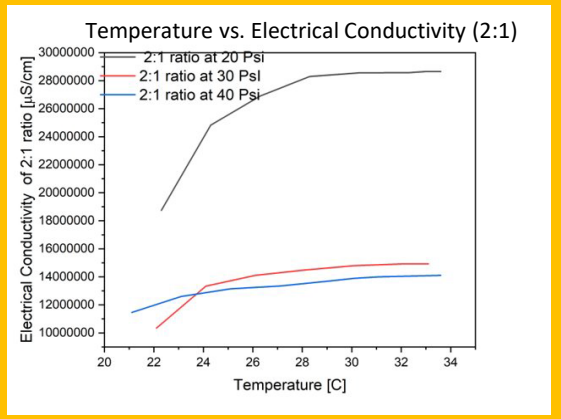




- Single Wall Carbon Nanotubes-Turbine Jet Cat Engine oil.



- 1:1 achieves steady state around 33°C, showing semiconductor behavior.



- 2:1 forms a band gap, and the temperature increases band gap energy.