

SOP for loading molten salt into pressure vessel

1. At room temperature. Pump is not running. Disconnect valve 22, 23 and 24. Keep valve G1, G2 and G3 close. (Valve G3 and 23 is connected to the sparging line)
2. Remove lid the lid with sparging line and thermal well, place in vice, loosen bolts.
3. Take the pressure vessel to Argon filled glove box.
4. Load 400 grams of molten salt chunks into the pressure vessel (will be full).
5. Heat the pressure vessel up to the melting point of molten salt with the protecting lid over the salt. Gently place the lid on the pressure vessel to ensure no damage to the seating surface. You will need to move the furnace and furnace controller into the glovebox.
6. Wait for the pressure vessel cool down add another 400 grams of molten salt.
7. Heat the pressure vessel up to the melting point of molten salt. Put vacuum lid into the molten salt with a graphite gasket. Try to tighten the bolts as much as reasonably possible while the salt is melted.
8. Let the pressure vessel cool down. Tighten the bolts. Keep Valve G1, G2 and G3 closed.
9. Put the pressure vessel back to the furnace in the Lab.
10. Re-connect valve 22, 23 and 24. Pump the system down to vacuum. Wrap the lid top with aluminum foil and insert the thermometer.

SOP for operating the molten salt sparging system (He sparges Kr as an example)

1. Set target temperature to the number higher than the melting point of molten salt.
2. Use Heater Mode I.
3. When the temperature reaches the target temperature, setting Kr gas flow through MFC 3 to 0.2 sccm.
4. Open Valve 18 (pump the residue gas trapped between MFC and valves) for 10 seconds and close it.
5. Open Valve 15 and set gas flow of Kr to 5 sccm, keep 24, 21 closed. Now the system is charging with Kr. At certain pressure, let it hold for an hour.
6. Open the mass spectrum software to record data.
7. Turn on valve 21, count 10 seconds. Keep Valve 10 closed, 3 and 5 open. Bleeding valve 5 turns.
8. Turn valve 19 on and set He gas flow 0.2 to sccm, pumping for 10 s and close it.
9. Turn on valve 16 and 23 simultaneously to start the sparging experiment.

SOP for turning off the sparging system

1. Turn off the mass spectrum software.

2. Close valve 22, 23 and 24.
3. Set temperature to 0. Heater to 0 mode.