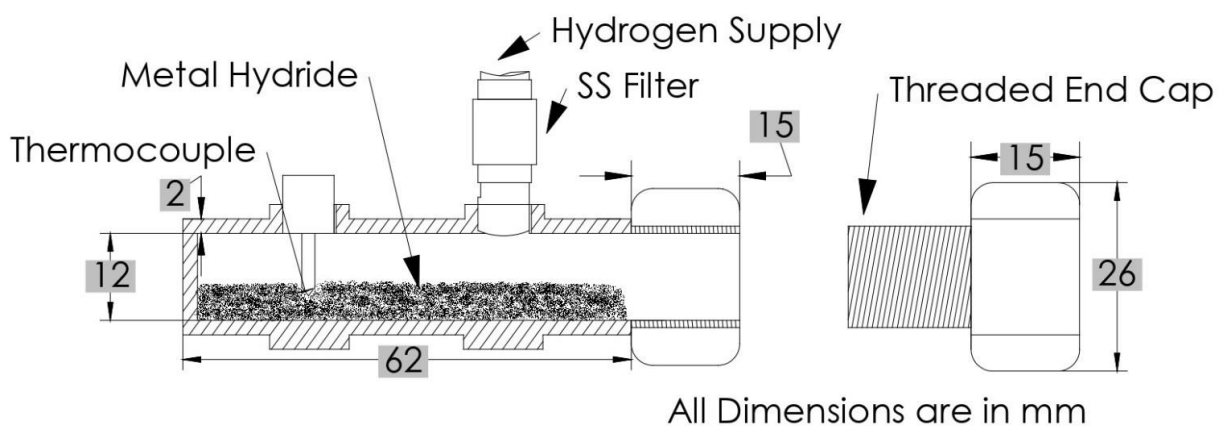
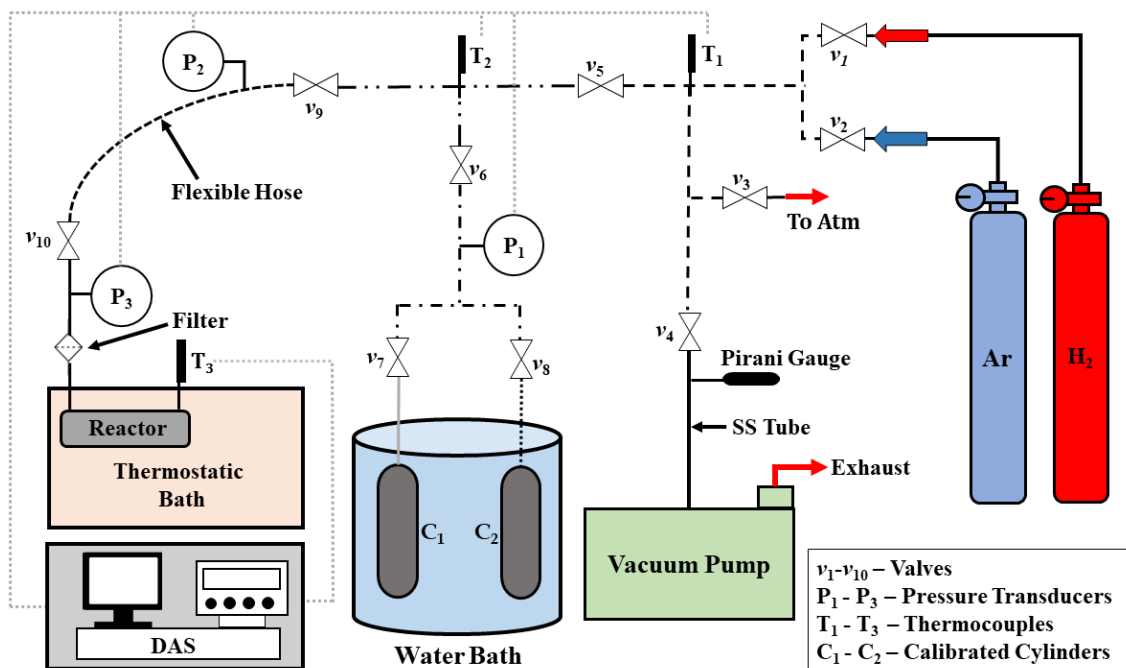


Hydrogen Research Lab Equipment's:

i. SIEVERT'S Apparatus (For Hydrogen Storage and CO₂ Capture tests)

This setup is constructed with ¼ inch seamless stainless steel (SS316) tubes, high pressure bellow-sealed valves (working pressure of 300 bar) at different location to control gas flow and ss calibrated cylinders for storage of hydrogen/CO₂. One “K” type thermocouple is fixed for measuring the temperature (T₁) of hydrogen/CO₂ gas at supply volume and one thermocouple inside the reactor to measure temperature (T₂) of material. Pressure transducers of range 0 - 200 bar with an accuracy of 0.25% are used for the measurement of system pressure (P1) and material equilibrium pressure (P2). Thermostatic Bath of range -20 to 150 °C is used for maintaining constant temperature for the reactor during sorption process and for supply of heat during desorption process. Hydrogen/CO₂ gas with 99.99% purity is used for sorption measurement, Argon gas is used for volume measurement and leak test of complete system.



ii. Metal Hydride Hydrogen Compressor

The reactor is fabricated from stainless steel (SS-316) and it is designed to carry 1-2 kg of MH powder which is kept in a hollow cylinder having a diameter and length of 33 mm and 163 mm respectively. This cylinder is enclosed in a 4 mm thick high-pressure cylinder (HPC) having 168 mm length. The HPC is further surrounded by a 2 mm thick cylinder of 48 mm internal diameter and 168 mm length which forms an annular space with an outer periphery of HPC for the flow of HTF.

The reactor is used for hydrogen compression, where purified hydrogen (99.99%) is supplied to the material present in the reactor at low pressure and at room temperature. By increasing the temperature hydrogen gas is compressed inside the reactor and desorbed to the high-pressure storage tank.



iii. Hydrogen Purification using Metal Hydrides

High hydrogen purity (99.999%) can be obtained.

- **Stage I**
 - Hydrogen absorption process
- **Stage II**
 - Venting the impurity gas
- **Stage III**
 - Hydrogen desorption process

