

Facilities

A range of different materials can be synthesized, e.g rare-earth transition-metal hydrides, Mg-based alloys, complex hydrides, and nanostructured metal-carbons. Materials with reduced grain-sizes can be prepared by ball-milling, or by melt-spinning. New compounds can be synthesized under a high pressure of hydrogen, by ball-milling or by molten synthesis. Thin-film samples can be synthesized by either PLD or magnetron sputtering.

Materials Characterisation

Hydrogen uptake and sorption kinetics can be measured using 3 constant pressure Thermogravimetric Analysers (Hiden IGA), and using 2 volumetric PCT-TPD systems (Hiden HTP). These systems can be used with a mass spectrometer, and a variable temperature cryostat (77 - 800K). Also, metal hydride samples (or small stores) can be tested on a dedicated cycling system.

There is a high-temperature TGA and a 150 bar DSC (inside an argon glovebox).

A test-rig allows the ability of membranes to purify H₂ gas-streams to be assessed.

Materials can be analysed in situ (up to 100 bar H₂) by Raman spectroscopy and XRD.