E0039

***In-Situ* Neutron Diffraction Studies of Metal Hydrides under Pressure.** R.G. Delaplane[1], A.B. Riabov[2], R.V. Denys[1,2], V.A. Yartys[3], [1]Studsvik Neutron Research Laboratory, Uppsala Univ., S-61182 Nyköping, Sweden, [2]Physico-Mechanical Inst. of the National Academy of Sciences of Ukraine, 5, Naukova St., Lviv, 79601, Ukraine, [3]Inst. for Energy Technology, P.O. Box 40, N-2027, Kjeller, Norway.

We have developed a technique for conducting neutron diffraction experiments on metal hydrides *in situ* in function of pressure. The precursor metal alloy powder is loaded into a stainless-steel autoclave (6 mm tube). The alloy is then activated at an elevated temperature in a furnace and charged with deuterium gas up to 10 bar. The autoclave connected to a gas rig is then mounted on the neutron diffraction instrument. The high-intensity medium-resolution instrument SLAD is used for initial measurements. Diffraction patterns were measured starting from an initial pressure of 10 bar, which was then decreased step-by-step to study phase-structural transformations during deuterium desorption. When the SLAD measurements revealed significant modifications of the diffraction pattern, high-resolution diffraction data were recollected on the instrument NPD. Results will be presented for $NdNi_{0.95}Cu_{0.05}InD_{1.41}$ where unit-cell volume changes, deuterium content and the Me-D and D-D interatomic distances in function of decreasing D_2 pressure were derived from Rietveld refinements.