

Abstract Submitted  
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**Neutron spectroscopy of gamma-MgH<sub>2</sub>** ALEXANDER KOLESNIKOV, Oak Ridge National Laboratory, VLADIMIR ANTONOV, VADIM EFIMCHENKO, Inst. Solid State Phys. RAS, Chernogolovka, Russia, GARRETT GRANROTH, Oak Ridge National Laboratory, S.N. KLYAMKIN, Moscow State Un., Russia, A.V. LEVCHENKO, MICHAEL SAKHAROV, Inst. Solid State Phys. RAS, Chernogolovka, Russia, YANG REN, Argonne National Laboratory, TIMMY RAMIREZ-CUESTA, ISIS, Rutherford Appleton Laboratory, UK — Under ambient conditions, magnesium dihydride exists in two forms, alpha-MgH<sub>2</sub> (the most stable modification) and gamma-MgH<sub>2</sub> (a less stable modification). The alpha-phase partly transforms to gamma-MgH<sub>2</sub> in the course of ball-milling and under high pressure and temperature. Due to the high hydrogen content of 7.6 wt.%, MgH<sub>2</sub> has been intensively studied as a prospective material for hydrogen storage. By exposing of alpha-MgH<sub>2</sub> to a pressure of 5 GPa and temperature 840 K, we prepared a sample, in which about 60% of the alpha-MgH<sub>2</sub> was transformed to gamma-MgH<sub>2</sub>. We have measured inelastic neutron scattering (INS) spectra of both the high pressure treated MgH<sub>2</sub> and starting alpha-MgH<sub>2</sub>, and extracted the spectrum for gamma-MgH<sub>2</sub>. The differences between the INS spectra and their agreement with the first-principles calculations for these compounds will be discussed.

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