Contribution ID: **221** Type: **Poster**

Rotational and long range diffusion in a lithium amide–lithium borohydride mixture

Wednesday, 9 December 2020 17:40 (20 minutes)

On-board hydrogen storage is still a challenge for fuel cell vehicles and other mobile applications. Complex hydrides, which contain ions such as BH4- and NH2-, have a high hydrogen capacity in combination with a low weight of the storage material. For example, Li4BH4(NH2)3 contains 11.1 wt.% hydrogen and desorbs more than 10 wt% at 573-673 K. In previous studies the high desorption temperature was reduced with additives. To understand the chemical behaviour and atomic motions of Li4BH4(NH2)3, we present an in situ phase analysis and quasielastic neutron scattering (QENS) during heating.
In situ X-ray diffraction was measured up to 573 K at P02 (DESY) and QENS was taken at TOFTOF (MLZ) in the temperature range 300-514 K. Li4BH4(NH2)3 melts at 494 K and during heating crystallization of a second phase was detected and identified as LiNH2, which remained a crystalline residue in the melted material. From the quasielastic signal rotational and long range motions were analysed and assigned to BH4- and NH2- of Li4BH4(NH2)3 and of the crystallized LiNH2 phase.

Primary author: ASLAN, Neslihan (HZG, GEMS at MLZ)

Co-authors: Dr PISTIDDA, Claudio (Helmholtz-Zentrum); LOHSTROH, Wiebke; BUSCH, Sebastian (GEMS at MLZ, HZG); MÜLLER, Martin (Helmholtz-Zentrum Geesthacht)

Presenter: ASLAN, Neslihan (HZG, GEMS at MLZ)

Session Classification: Joint poster session of MLZ User Meeting and DN2020

Track Classification: UM: Materials Science