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Crystal Structure of Ball Milled Hydrogen Storage Materials. J. Huot, Hydrogen Research Inst., Univ. du Québec à Trois-Rivières, 3351 Des Forges, Trois-Rivières, Québec, G9A 5H7 Canada.

One hurdle for the emergence of the hydrogen economy is the availability of a safe, efficient, and low cost mean of hydrogen storage. Metal hydrides are a promising candidate for either mobile or stationary applications but in order to reach commercial applications problems of low hydrogen capacity, sorption kinetics and cost have to be solved. In the last decade it has been shown that nanostructured metal hydrides present enhanced properties compared to their conventional counterpart. The effect of nanocrystallinity on hydrogen sorption behaviour of pure magnesium hydride prepared by high energy ball milling will be presented. Neutron vibrational spectroscopy was used to study the interaction of hydrogen atoms in its surrounding in ball milled magnesium hydride. Real time X-ray investigations of hydrogen desorption in MgH_2-Nb nanocomposite using synchrotron radiation showed the formation of a metastable niobium hydride phase which is responsible for the fast sorption kinetics of this nanocomposite. Another class of metal hydrides, the BCC Laves phase related alloys will be reviewed. The structural properties of as cast and ball milled alloys was studied by x-ray and neutron powder diffraction. It was found that upon milling the BCC phase transforms to a FCC phase.