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Aging Effects on the Hydrogen Storage Characteristics of Li-Mg-B-N-H Complex Hydrides[1] SESHA SRINIVASAN, Florida Polytechnic University, College of Innovation and Technology, ERIC VICKERS, JAMES MULHARAN, Florida Polytechnic University, College of Engineering, GHAZI DARKAZALLI, Florida Polytechnic University, YOGI GOSWAMI, ELIAS STEFANAKOS, University of South Florida, Clean Energy Research Center, FLPOLY-CERC COLLABORATION — The aging effects on the hydrogen storage characteristics and chemical formulations of the complex hydrides are discussed in this study. The aging effects due to atmospheric events such as oxygen and moisture coverage and self-decomposition are currently under investigation. The candidate material chosen for this study is Lithium/Magnesium based complex hydride $LiBH_4/LiNH_2/MgH_2$. These materials were prepared using high energy ball milling under Ar/H2 atmosphere with different milling durations. The chemical, structural and microstructural characteristics of the synthesized and aged materials were compared and investigated using TGA/DSC, FTIR, XRD, BET and SEM analytical tools. Hydrogen storage properties such as hydrogen sorption kinetics, cycle life and pressure-composition isotherm (PCI) was examined via high pressure, high temperature Sievert's type apparatus. This current study will shed light to compare and contrast the above mentioned characteristics for the aged samples practically at the same experimental conditions. Furthermore, we have investigated the relationship between the aging effects with respect to the crystallite sizes of the candidate compounds and their nano-dopant variants.

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Sesha Srinivasan
Florida Polytechnic University, College of Innovation and Technology

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