

## Magnesium Based Materials For Hydrogen Based Energy Storage: Past, Present And Future

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Magnesium hydride owns the largest share of publications on solid materials for hydrogen storage. The “Magnesium group” of international experts contributing to IEA Task 32 “Hydrogen Based Energy Storage” recently published two review papers presenting the activities of the group focused on magnesium hydride based materials [1] and on Mg based compounds for hydrogen and energy storage [2]. This presentation will not only review the latest activities on both fundamental aspects of Mg-based hydrides and their applications, but will also present a historic overview on the topic and will outline projected future developments. Particular attention will be paid to the theoretical and experimental studies of Mg-H system at extreme pressures, kinetics and thermodynamics of the systems based on MgH<sub>2</sub>, nanostructuring, new Mg-based compounds and novel composites, and catalysis in the Mg based H storage systems. Finally, thermal energy storage and upscaled H storage systems accommodating MgH<sub>2</sub> will be presented.

### Reference:

[1]: J.-C. Crivello, B. Dam, R. V. Denys, M. Dornheim, D. M. Grant, J. Huot, T. R. Jensen, P. de Jongh, M. Latroche, C. Milanese, D. Milčius, G. S. Walker, C. J. Webb, C. Zlotea, V. A. Yartys. Review of magnesium hydride-based materials: development and optimization.// *Applied Physics A: Materials Science and Processing*. 122 (2): 97 (2016) 1-20.

[2]: J.-C. Crivello, R.V. Denys, M. Dornheim, M. Felderhoff, D.M. Grant, J. Huot, T. R. Jensen, P. de Jongh, M. Latroche, G.S. Walker, C.J. Webb and V.A. Yartys. Mg based Compounds for Hydrogen and Energy Storage.// *Applied Physics A: Materials Science and Processing*. 122 (2): 85(2016) 1-17.