MECHANOCHEMISTRY UNDER HYDROGEN GAS - SYNTHESIS OF HYDRIDES FOR ENERGY STORAGE

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Mechanochemistry under hydrogen gas is a method of choice for the synthesis of light-weight hydrides. In the last ten years, fast and efficient formation of key hydrides such as magnesium hydride (MgH_2)[1,2], Mg-complex hydrides (Mg_2TMH_x, *TM* = Fe, Co, Ni)[1], Mg-based nanocomposites (MgH_2-TiH_2, MgH_2-Si)[3,4], alkali alanates ($NaAlH_4$, $KAlH_4$)[5,6], Li imide/amide (Li_2NH/$LiNH_2$)[7] magnesium amide ($Mg(NH_2)_2$) [8] and mixed-cation imide Li_3MgN_2H[8] has been achieved in our laboratory. Besides being an elegant route for hydride formation, this method allows easy and controlled addition of dopants for fast screening studies [9]. Moreover, reaction mechanisms during synthesis can be analyzed from the shape of in-situ hydrogenation curves. Last but not least, this method produces nanostructured materials with exceptional performances for hydrogen storage and electrochemical applications [10-13]. This presentation honors the memory of our beloved colleague Michel Latroche who passed away recently and significantly contributed to this research topic.

References

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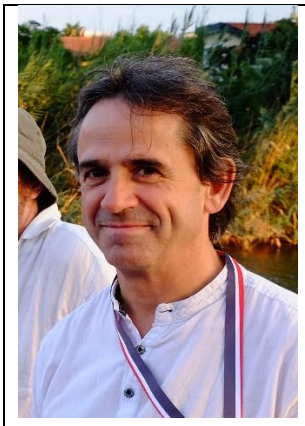

Fermin CUEVAS obtained his PhD in Physics at Autonomous University of Madrid (Spain) in 1996. After postdoctoral training at MPI Metals Research (Germany) and CNRS- East-Paris Institute of Chemistry and Materials (France), he got in 2002 a permanent research position at CNRS. His main research activities are focused on intermetallics, composites and complex hydrides for solid state hydrogen storage as well as their functional properties as electrode and electrolyte materials for Ni-MH and Li-ion batteries. He has published over 150 articles in peer-reviewed international journals. He is currently head of the Interaction of Hydrogen and Matter group at ICMPE, co-head of the Storage axis at the French Research Network on Hydrogen Energy, and co-director of the French-Australian International Research Network on Conversion and Energy Storage (IRN-FACES).