

TRIBOCHEMICAL DECOMPOSITION OF LIGHT HYDRIDES

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Light hydrides form a promising group of compounds able to store hydrogen for on-board hydrogen storage due to high gravimetric capacity. However, thermodynamic and kinetic constrains have precluded their implementation at near room temperature applications. Those constrains are usually overcome by using thermal energy but non-thermal methods are recently being explored (1,2) as innovative ways to surmount them. In this context, the phenomenon known as mechanically stimulated gas emission (MSGE) has been studied in different compounds (3) but it has not still dealt with light hydrides. This work is aimed at closer investigating into H₂ desorption associated with tribochemical decomposition under mechanical deformation of MgH₂. The phenomenon has been characterized in situ during deformation of MgH₂ on the micrometric scale using MSGE and confocal microRaman Spectroscopy. An instantaneous ($t < 1$ s) release of hydrogen (3–50 nmol/s) is observed during mechanical deformation (4). Explanations to the observed behaviour will be discussed and preliminary experiments with chemical hydrides will be exposed.

References

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