

Hydrogen Storage and Delivery Using Liquid Carriers

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In our concept of a “non gaseous hydrogen” infrastructure the carrier is an organic liquid which can undergo a reversible catalytic addition of hydrogen. The thus “loaded” liquid can be catalytically dehydrogenated at the point of use for providing hydrogen at either a stationary or mobile location. The concept will be illustrated by the performance of N- and O-heterocyclic molecule carriers. The catalytic dehydrogenation reaction with present carriers requires an input of heat at temperatures of 150 – 200 °C which may be difficult to realize with PEM fuel cells. To address this we’ve developed the concept of autothermal liquid carriers, compositions that in appropriate dehydrogenation reactor systems could provide both the stored hydrogen and the thermal energy that is required to liberate it.