Abstract

The present invention provides for a method and a reactor for generating hydrogen from a metal hydride. The method includes the steps of: providing a fuel containing a metal hydride and water; catalyzing a reaction of the hydride and water by using a functional membrane system; and thereby generating hydrogen. The reactor for generating hydrogen includes a vessel, and a functional membrane system disposed within the vessel. The functional membrane system compartmentalizes the vessel into two chambers. One of the two chambers is a fuel chamber, and the other chamber is a hydrogen chamber. Fuel, containing a metal hydride and water, is introduced to the fuel chamber, where it undergoes a catalytic reaction to generate hydrogen. The generated hydrogen then passes through the functional membrane system into the hydrogen chamber, and exits the reactor via the hydrogen outlets. The functional membrane system includes a membrane and a catalyst. The catalyst is adapted to promote the removal of hydrogen from a metal hydride.