Mg-EVA Composites with Selective Permeability as an Hydrogen Storage Material

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ABSTRACT

Hydrogen (H_2) is considered one of the most promising sources of renewable energy. Hydrogen is the most abundant element in nature and one the lightest. Currently different hydrogen storage alternatives have been explored: high pressure, carbon nanotube, metal hydrides, composite materials, organic molecules, etc. From the wide range of alternatives for hydrogen storage, in this study we consider MgH_2 as one of the safest, most efficient and compact way to store hydrogen. Magnesium is one of the most abundant elements on earth and it has a great gravimetric storage capacity of hydrogen (7.6 wt%). The problem of the magnesium is its high reactivity with oxygen and moisture. Once the oxide is formed the hydrogen absorption - desorption process is inhibited. One possible solution to the problem is to generate a composite material with selective permeability. In this study is explored the selective permeability, the behavior and interaction of the composite magnesium – ethylene vinyl acetate copolymer (EVA). Using EVA copolymer at 28% vinyl acetate. The study and characterization of this nanocomposite is great promise for hydrogen storage.

Keywords: Composite, ethylene vinyl acetate copolymer, magnesium