

Abstract

The present invention relates to hydrogen production for the generation of energy. The invention describes methods, devices and assemblies involving hydrogen production including reacting hydrogen producing compounds, such as alcohol, organothiol or organoselenol compounds, with a metal substrate, such as gold, to produce hydrogen gas and utilizing the hydrogen gas to generate energy. The present invention further describes regenerating spent compound, for example disulfides (R-S-S-R), to a form suitable for hydrogen production by reacting the spent compound with hydrogen. Hydrogen storage and production, as described herein, is useful for producing hydrogen for energy production in hydrogen consuming devices, such as combustible engines and fuel cells, for example, as located on a hydrogen powered vehicle.