

Abstract

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Optimization of PV-Hydrogen Electrolyzes System

In this work, an electrolyze system is considered to produce Hydrogen (H₂) using photovoltaic (PV) panels. The system was experimentally installed and tested under the weather conditions of Cairo 30 °N. Different PV modules with different specifications of current and voltage were tested for individual loads. One of PV modules that have the maximum current with minimum voltage can produce the highest amount of Hydrogen. In addition, the parameters of concentration of salts (KOH) in water and the apart-distance between the electrodes were studied. The apart-distance of 5 cm between the electrodes was found as optimized distance that produces more H₂ quantity. Moreover, a H₂-cell of 20*15*13 cm³ has higher H₂ production than the size of 6*6*24 cm³, 24*6*24 cm³ and 24*24*24 cm³ cells. It is obtained that the optimal system that considers the above efficient conditions must have a PV module with high current and small voltage.