

## Hydrogen Production Using Solar Energy

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**Abstract :** This paper presents an experimental study for hydrogen production using alkaline water electrolysis operated by solar energy. Two methods are used and compared for separation between the cathode and anode, which are acrylic separator and polymeric membrane. Further, the effects of electrolyte concentration, solar insolation, and space between the pair of electrodes on the amount of hydrogen produced and consequently on the overall electrolysis efficiency are investigated. It is found that the rate of hydrogen production increases using the polymeric membrane installed between the electrodes. The experimental results show also that, the performance of alkaline water electrolysis unit is dominated by the electrolyte concentration and the gap between the electrodes. Smaller gaps between the pair of electrodes are demonstrated to produce higher rates of hydrogen with higher system efficiency.

**Keywords :** hydrogen production, water electrolysis, solar energy, concentration

**Conference Title :** ICSEEM 2017 : International Conference on Systems Engineering and Engineering Management

**Conference Location :** Zurich, Switzerland

**Conference Dates :** April 20-21, 2017