

# Solar Energy Harvesting Using Ionic Polymer-Metal Enhanced Water Electrolysis

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The energy supplied by solar often does not coincide with the demand of consumer. An energy storage system is required to store the extra energy in the form of other deliverable and storable energy sources for later use. Hydrogen has high energy density and burns with zero greenhouse emission, making it an ideal to be stored and consumed. Our goal is to develop a high energy-efficient water electrolysis generator, which converts the electricity from solar to hydrogen fuel. Existing research found that application of electricity to Ionic polymer-Metal Composite (IPMC) can efficiently split water molecule. We explored a new IPMC fabrication method, which can further improve the efficiency. Our data shows that roughening the surface of IPMC through sanding or plasma etching with extra coating of gold can improve the efficiency. The data also validates a dynamic model that is developed to capture the dynamics of IPMC enhanced water electrolysis.