

# ENERGY AND MATERIALS RESEARCH

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## Critical investigation of photo-semiconducting material for water splitting applications

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The purpose of this paper is to present a literature review of a sampling of the current available research documents that discuss experimental and potential industrial processes of producing gaseous hydrogen fuel utilizing various nanotechnology products and techniques. While the production of essentially pure hydrogen gas ( $H_2$ ) is not a new concept and has been used in laboratories and industry for a number of decades, the development of nanotechnology and its unique products has opened the door for an explosion of new research to establish processes for making hydrogen in ways that are much more environmentally conscious, safer, and potentially will allow production from totally renewable sources. The current and recent research includes work done producing hydrogen from a number of sources with water being the source used most. The promise of potentially producing sufficient hydrogen to meet the world energy needs using water as the source for the hydrogen and solar energy as the source of the power to fuel the production is reason enough to justify the investment in the research into this field of study. Because of the attractiveness of this approach and the significant amount of work being done with water and solar, we concentrate our review in that area. We touch upon other methods but remain with the water/solar concentration. The common theme in all the papers reviewed is the utilization of nanotechnology in all of the research looked at.

### Biography

Hussein Alrobei is a Ph.D. student under the supervision of Manoj K Ram. He has background in the field of photo electrochemical, advanced materials, polymers and energy. He has been involved on photo electrochemical properties on various metal oxides, polymers and conducting polymers, and recently his patent on Nano-hybrid structured regioregular polyhexylthiophene blend films for production of photo electrochemical energy has been approved.

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