

Solar Thermochemical Hydrogen Production Plant

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Abstract: *Our main objective of the project was to study all the existing methods of hydrogen production and find most feasible and renewable methods among all. We studied them, compared and analyzed each of the methods that are widely known or used for the production of hydrogen gas and came to a conclusion that steam methane reforming method of hydrogen production is the most widely used and most efficient method among the rest. We have introduced the usage of solar energy in the steam methane reforming reaction in the place of utility. However, steam reforming method of methane process is considered as state-of-the-art technology for efficient production of hydrogen regarding the current scientific R&D [2], introducing solar into it might increase some amount of expense but will be a better move while switching to renewable sources on Earth. SRM [3] method of hydrogen production is a highly endothermic process. This requires high potential heat source for the purpose of preheating feedstock, producing steam of high potential and controlling the process. However, the use of concentrated solar energy in this has the potential of avoiding 35-40% of the CO₂ - carbon dioxide emissions derived from the conventional SRM process based on fossil fuel. Hence we have made a sustainable project wherein we aim to use renewable energy to generate hydrogen which in itself is considered fuel of the future. Hydrogen produced using solar thermal energy is cost effective, many countries are considering solar energy to produce clean fuel for the future.*

Keywords: Hydrogen Production, Water Gas Reaction, Steam Reforming Method, Concentrated Solar Receivers, Production of Hydrogen from solar energy, Hydrogen - a clean fuel , Energy Carrier.

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