

Review and research challenges on mass H₂ Production using Alkaline electrolysis

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Recently, there is a growing interest in P2G (power to gas) technology related to the use of hydrogen as an energy carrier through the conversion of redundant renewable energy. Producing hydrogen from renewable energy and converting it to other important fuels such as ammonia can mitigate the negative effects of toxic gases on the environment and compensate for the intermittent nature of renewable energy sources. Connected to Microgrid, these systems can meet electrical load profiles and provide ammonia as a fuel and chemical feedstock that is easy to store. This simulation, compares and analyzes sustainability and Economic possibilities aspects of two P2G for producing renewable ammonia or methanol by using renewable power based electrolytic hydrogen. Producing hydrogen using a renewable energy source and synthesize ammonia or methanol, which is used as a storage means, by using alkaline water electrolysis through process simulation, ASPEN PLUS. By comparing the economic feasibility, It compare whether to produce ammonia or methane depending on the simulation. It's using an Aspen Plus custom models to simulate an alkaline water electrolysis and a fuel cell.