Study on Hydrogen Production System based on Sodium Borohydride Solutions

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ABSTRACT

After the Industrial Revolution, people began to apply fossil fuel. However, the application of fossil fuel released CO2, which caused greenhouse effect and even polluted the environment. Not only concerning the negative to environment, but the amount of fossil fuel reduces abruptly these days. It ’s urgent for people to explore for a substitute resource with little pollution. As taking this into concerned, fuel cell become the first choice. The only shortage of fuel cell is that it not only requires hydrogen with high purity, but be difficult to be storing. So, it trends to apply hydrogen by using composite of hydrogen -- Sodium Borohydride, in stead of using hydrogen directly. People turn to discuss and study the Sodium Borohydride due to both the high capacity of hydrogen and the simplicity of density control. Most important of all, the generation of Sodium Borohydride is low-toxicity to environment and can be reverted to Sodium Borohydride, which also achieve the goal of recycling usage. The objective of this study is to discuss the generation amount and efficiency of hydrogen production in different solution flow rate by flowing throw the catalyst reactor, and also to analyze the durability of catalyst reactor. During the experiments, the solution density of Sodium Borohydride is 10wt% and 15wt%; and the solution density of Sodium hydroxide is 1wt%. The research indicates that Hydrogen production rate changes with the solution flow rate. However, the temperature and the hydrogen production flow rate appear better stability while the Sodium Borohydride solution flow rate is 100cc/min with solution densence 15wt%. The durability of catalyst reactor and viscosity of hydrogen production will also affect the production of hydrogen.

Keywords : fuel cell、Sodium Borohydride、Hydrogen production rate、catalyst reactor

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