

A structured Ni-B catalyst for hydrogen generation from NaBH₄ solution

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Along with the increasing demand in using environmental friendly energy sources for transportation and personal electronic applications, fuel cells are attracting current global attention due to its large advantages. Among the various types of fuel cell, the proton-exchange membrane fuel cell (PEMFC) has been very widely researched in recent years. Hydrogen source providing for this system can be produced from chemical hydrides, especially from sodium borohydride (NaBH₄). Sodium borohydride has been intensively studied as a hydrogen storage material because of its advantages of: non-flammability and stability in air, easily controlled hydrogen generation rate, side product recyclability, and high hydrogen storage efficiency.

In this study, we prepared a structured Ni-B catalyst on the Ni foam instead of using Ni-B catalyst powder in order to prevent the continuous loss and increase the efficient utilization of Ni-B catalyst during the reaction time. The Ni foam was adopted as a substrate due to its high thermal and chemical stability in the reaction environment. The Ni-B catalysts were prepared by chemical reduction method on Ni foam substrates, and the effects of the preparation conditions on the catalyst activity was also examined.