

## Potential Hydrogen Storage Material: Biphenyl-based Eutectic Mixture

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With the increasing global warming issues, renewable energy carriers which are sustainable and emit no greenhouse gases have been explored since renewable energy has a great fluctuation depending on the weather and time. Long term storage of excess renewable energy is of great importance. Hydrogen has been considered as a promising renewable energy carrier. Accordingly, innovative hydrogen storage technology needs to be developed. Hydrogen storage technologies are classified into two categories which are physical-based storage and materials-based storage. Physical-based storage have concerns on safety and cost. Therefore, liquid organic hydrogen carrier (LOHC) which is one of the material-based storages has received attention. LOHCs have hydrogen content of 5–8 wt%, reversibility, commercial availability and compatibility with conventional energy infrastructure. In this study, we report a hydrogenation of biphenyl-based eutectic mixture which consists of biphenyl and diphenylmethane. Full hydrogenation of biphenyl based-eutectic mixture was achieved at various catalysts and temperatures. Consequently, biphenyl-based eutectic mixture can store H<sub>2</sub> with 6.9 wt% of gravimetric density.