

A new approach of liquid organic hydrogen carrier's dehydrogenation reactor by application of microfluidic channel

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Liquid organic hydrogen carrier(LOHC) is liquid organic compounds can safely and stably transport hydrogen. LOHC can transport hydrogen to its destination, as well as on-board type LOHC technical applications. For on-board application, the dehydrogenation reaction of LOHC must be possible within an appropriate time and temperature, and a reaction in which the only hydrogen is selectively generated rather than multiple products are generated by the dehydrogenation reaction. To enable the selective reaction, it is important to form an appropriate system between the LOHC and the catalyst, but the design of the reactor system can also make the dehydrogenation reaction more selective. There are various types of dehydrogenation reactor system modules, such as batch type, plug flow reactor, and microfluidic reactor. Among various types, the microfluidic reactor can improve the selectivity of the reaction by the microfluidic reaction by a small volume of the reactant. In this study, we designed a microfluidic reactor using a microflow channel, and we would like to report on the performance comparison and feasibility between the existing batch-type reactor and the microfluidic reactor.