

## Liquid Ammonia as a Sustainable and Efficient Hydrogen Carrier : Power Generation System Fueled by Liquid Ammonia

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Owing to the increasing concerns about serious environmental issues such as climate change and particulate matters, hydrogen has attracted significant attention in conjunction with renewable energy, to restructure the energy sources from conventional fossil fuel to sustainable and efficient energy. However, storage and transportation of hydrogen are considered as a major drawback due to low volumetric energy density of hydrogen. To overcome these issues, we present a liquid ammonia as a highly viable chemical-based hydrogen storage material. Furthermore, we demonstrate a 1kW-class power generation system fueled by liquid ammonia to confirm the feasibility of ammonia as a hydrogen carrier. This system comprises a dehydrogenation reactor, a heat exchanger, an adsorbent tower and a polymer electrolyte membrane fuel cell. The as-integrated system not only produced electricity in a continuous manner, utilizing liquid ammonia without any performance degradation, but also achieved CO<sub>x</sub>-free operation condition with record-breaking system efficiency