

A Portable Power-Pack Fueled by Carbonsilane-Based Chemical Hydrides

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Carbonsilanes have recently been demonstrated as new hydrogen storage materials for polymer electrolyte membrane fuel cells and have exhibited fast hydrogen release kinetics, even at room temperature, by methanolysis in the presence of sodium methoxide as a catalyst. By building on prior results, we have developed an efficient hydrogen generator fueled by one of these carbonsilanes, 1,3,5-trisilacyclohexane, in this study. The H₂-generator exhibited a hydrogen generation rate up to 1.2 slm as well as fast load-following capability, with the response time of hydrogen production being 20~30 seconds. The as-developed hydrogen generator and 100We PEMFC have been integrated into a portable power-pack whose capability as an off-grid power source has been tested.