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Reviewer Invitation for HE-D-22-04575

1 pesan

Zheng Sun <em@editorialmanager.com> 8 Agustus 2022 pukul 10.19
Balas Ke: Zheng Sun <szcup613@163.com>
Kepada: Dedi Rohendi <rohendi19@unsri.ac.id>

Manuscript Number: HE-D-22-04575
Title: Experimental studies on novel modular shell and tube metal hydride reactor with 50 kg alloy capacity
Article type: Full Length Article
Submitted to: International Journal of Hydrogen Energy

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Zheng Sun
Assistant Editor
International Journal of Hydrogen Energy

ABSTRACT:
This study concentrates on experimental analysis of a large scale metal hydride based hydrogen storage reactor having 50 kg LaNi5. In order to cater the heat transfer limitations of hydrogen storage in large scale systems, the present design have been developed as shell and tube type heat exchanger configuration with 7 tubes supported by means of 4 baffles having total 50 kg LaNi5 distributed equally among them and water as heat transfer fluid flows across the shell for heat transfer. The experimental study was performed for studying the absorption and desorption performance of the present hydrogen reactor wherein in case of absorption the parameters varied were HTF flow rate at 300C and supply pressure of hydrogen and in case of desorption which was carried out at atmospheric pressure, HTF flow rate and HTF temperature were varied. The metal hydride reversibly stores 680 grams of hydrogen amounting to 1.34 wt. % of gravimetric capacity of metal hydride and equivalent energy
storage of 10.4 MJ. In case of absorption, when the flow rate selected was 20 LPM the absorption time for 90% reaction completion was observed to be 1286s(21.4 min) at 30 bar H2 supply pressure. In case of desorption studies, it was observed that the varying flow rate from 15 to 25 LPM has negligible effect on hydrogen desorption hence 15 LPM was selected as flow rate for further desorption experiments. Further increasing HTF temperature from 600C to 800C improves the performance significantly.

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Reviewer Invitation for HE-D-22-06239

Sonil Nanda <em@editorialmanager.com> 12 Oktober 2022 pukul 00.52
Balas Ke: Sonil Nanda <sonil.nanda@outlook.com>
Kepada: Dedi Rohendi <rohendi19@unsri.ac.id>

Manuscript Number: HE-D-22-06239
Title: Unraveling the corrosion kinetics of gallium-aluminum for efficient hydrogen production from water at zero CO2 emission
Article type: Full Length Article
Submitted to: International Journal of Hydrogen Energy

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With best regards and many thanks,

Sonil Nanda, Ph.D.
Assistant Subject Editor
International Journal of Hydrogen Energy

ABSTRACT:
Hydrogen (H2) generation via metal hydrolysis is a promising eco-friendly technique that has been widely accepted by the industrial sector. This work mainly focuses on stable hydrogen production through an innovative surface-etching process to expel the passive aluminum oxide (Al2O3) layer, followed by liquid gallium (Ga) metal activation for aluminum hydrolysis in a neutral sodium chloride (NaCl) solution. More precisely, aluminum (Al) activation is easily achieved by means of a simple pretreatment, thereby enhancing the pure hydrogen productivity to 95.9% by adopting an Al-water reaction at various temperatures (35–65 °C) in a 0.4 M NaCl solution. Density functional theory (DFT) calculations confirmed the spontaneity of the initial Al oxidation by the Ga liquid metal, leading to spontaneous water splitting reactions. Profoundly, a stable hydrogen production rate was maintained at a low temperature of 35 °C for 25 h in an NaCl solution. Furthermore, the Ga catalyst
maintained its hydrogen generation performance even after five reusability cycles without productivity decay. The reaction byproducts, excluding hydrogen, mostly consist of aluminum hydroxide (Al(OH)3), which could enable resource circulation in pharmaceutical, textile dyeing and various chemical industries. This study demonstrates the feasibility of the new Ga-activated Al-water system with an enhanced Ga-Al contact for large-scale hydrogen production from seawater and portable fuel cell devices.

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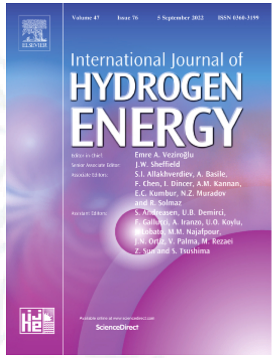

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