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Design and computational analysis of a metal hydride hydrogen storage system with hexagonal honeycomb based heat transfer enhancements-part A

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## Abstract

In this study, design and performance analysis is carried out for a 10kWh <u>metal hydride</u> based <u>hydrogen</u> <u>storage</u> system. The system is equipped with distinctive <u>aluminium</u> hexagonal honeycomb based <u>heat</u> <u>transfer enhancements</u> (HTE) having higher surface area to volume ratio for effective heat transfer combined with low system weight addition. The system performance was studied under different operating conditions. The optimum absorption condition was achieved at 35bar with water at <u>room temperature</u> as <u>heat transfer fluid</u> where up to 90% absorption was completed in 7200s. The performance of the reactor was observed to significantly improve upon the addition of the HTE network at a minimal system weight penalty.

Introduction