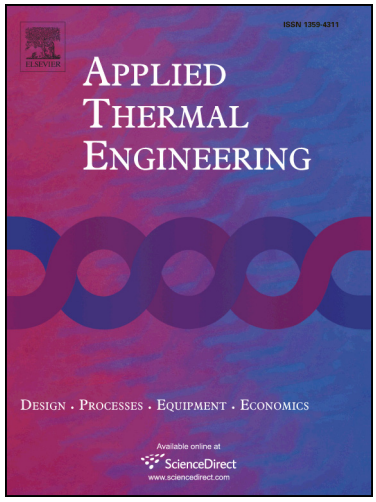

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PII: S1359-4311(17)31274-7
DOI: http://dx.doi.org/10.1016/j.applthermaleng.2017.04.004
Reference: ATE 10150

To appear in: *Applied Thermal Engineering*

Received Date: 24 February 2017
Revised Date: 29 March 2017
Accepted Date: 1 April 2017

Please cite this article as: E. Mastronardo, L. Bonaccorsi, Y. Kato, E. Piperopoulos, M. Lanza, C. Milone, Strategies for the enhancement of heat storage materials performances for MgO/H_2O/$Mg(OH)_2$ thermochemical storage system, *Applied Thermal Engineering* (2017), doi: http://dx.doi.org/10.1016/j.applthermaleng.2017.04.004

Strategies for the enhancement of heat storage materials performances for $MgO/H_2O/Mg(OH)_2$ thermochemical storage system

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Abstract

$MgO/H_2O/Mg(OH)_2$ thermochemical storage system is still at an early stage of development and several research efforts are accomplished to bring this technology at an applicative stage. The material development is the key point for the system implementation. Among the investigated strategies, the synthesis route for the preparation of $Mg(OH)_2$ over a carbonaceous support, *i.e.* exfoliated graphite (EG), significantly affect the stability of the hybrid material and its thermochemical performances. In this study the influence of the preparation method, namely Deposition-Precipitation and Reverse Deposition-Precipitation, on the morphology and thermochemical performances of $EG/Mg(OH)_2$ hybrid materials have been investigated. Among the overall investigated samples, $EG/Mg(OH)_2$ obtained by Deposition-Precipitation and Reverse Deposition-Precipitation realized through one shot addition of the precipitating agent and at 0°C allow to achieve the best thermochemical performance. As main result a storage heat value of 1166, 1163 and 1080 $kJ/kg_{Mg(OH)2}$, respectively, has been obtained.

Keywords: thermochemical storage; deposition-precipitation; reverse deposition-precipitation; magnesium hydroxide; exfoliated graphite