TECHNOLOGY OFFER

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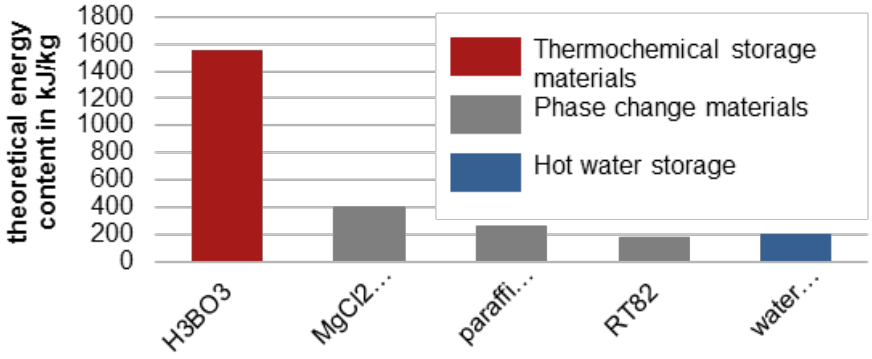
BORIC ACID

MOTIVATION

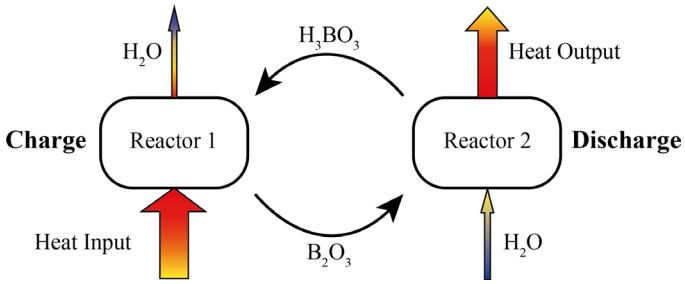
In the interest of energy and cost efficiency it is important to use energy in a process as comprehensive as possible. Heat storage systems pose one possible solution to overcome discrepancies in heat production and heat consumption. Particularly thermochemical energy storage promises high storage densities and the possibility of long storage periods without significant losses.

TECHNOLOGY

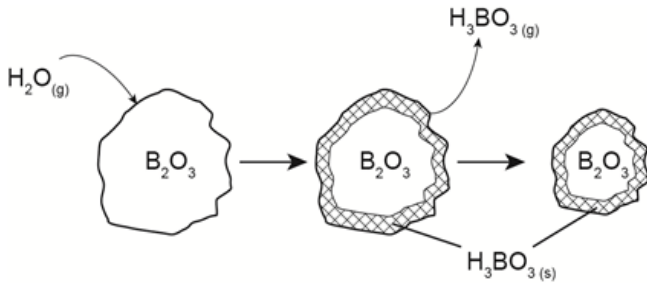
The patent is based on the usage of boric acid (H_3BO_3) to store energy. Compared to other heat storage systems, the system H_3BO_3/B_2O_3 excels having a high theoretical energy storage density and unlimited cycle stability.



The figure shows the principal process.



When heated in Reactor 1, the H_3BO_3 is decomposed while the reaction enthalpy is stored in the products (B_2O_3, H_2O). The B_2O_3 reacts back in reactor 2 with H_2O to H_3BO_3 while releasing the stored energy. Thereby the formed H_3BO_3 sublimates, resulting in shrinking of the B_2O_3 particles and thus full conversion.



The gaseous H_3BO_3 crystalizes and forms new particles preventing any degradation effects.

REFERENCE:
M045/2015

BENEFITS:
- High Energy Density
- Low Storage Material Cost
- Fast Response Time
- No Material Degradation

APPLICATIONS:
- Heat storage in the range of 150°C
- Increasing the energy efficiency
- Shifting heat in batch processes

KEYWORDS:
thermochemical energy storage, boric acid, process scheme, boron trioxid

OPTIONS:
license agreement

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