**TECHNOLOGY OFFER**

**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\textsubscript{3}BO\textsubscript{3}) to store energy. Compared to other heat storage systems, the system H\textsubscript{3}BO\textsubscript{3}/B\textsubscript{2}O\textsubscript{3} excels having a high theoretical energy storage density and unlimited cycle stability.

The gaseous H\textsubscript{3}BO\textsubscript{3} crystalizes and forms new particles preventing any degradation effects.

**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

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The figure shows the principal process.

When heated in Reactor 1, the H\textsubscript{3}BO\textsubscript{3} is decomposed while the reaction enthalpy is stored in the products (B\textsubscript{2}O\textsubscript{3}, H\textsubscript{2}O). The B\textsubscript{2}O\textsubscript{3} reacts back in reactor 2 with H\textsubscript{2}O to H\textsubscript{3}BO\textsubscript{3} while releasing the stored energy. Thereby the formed H\textsubscript{3}BO\textsubscript{3} sublimates, resulting in shrinking of the B\textsubscript{2}O\textsubscript{3} particles and thus full conversion.

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