

Can a Bao 2 / Bao system be used for thermochemical heat storage?

In this paper, we have revisited the use of reduction-oxidation reactions of the BaO 2 /BaO system for thermochemical heat storage at high temperatures. Using thermogravimetric analysis, reduction and oxidation reactions were studied in order to find the main limitations associated with each process.

Is sintering of Bao 2 / Bao a hindrance for practical high temperature energy storage?

Sintering of BaO 2 /BaO is a hindrance for practical high temperature energy storage. MgO-stabilized BaO-based materials were synthesized by co-precipitation methods and investigated for improving the longevity and reactivity of the redox materials. The effect of the calcination environment during synthesis on sample purity was evaluated.

What is the storage capacity of a Bao 2 /MgO sample?

A BaO 2 /MgO sample with 33 wt% MgO shows good storage capacity with weight gain/loss at 5.65% (corresponds to approximately 290 kJ/kg) over 200 redox cycles. 1. Introduction Harvesting and utilizing solar energy offers a sustainable way to reduce fossil fuel use and meet increasing energy demands [, ,].

Can barium peroxide be used as a thermochemical energy storage system?

The barium peroxide-based redox cycle was proposed in the late 1970s as a thermochemical energy storage system. Since then, very little attention has been paid to such redox couples. In this paper, we have revisited the use of reduction-oxidation reactions of the BaO 2 /BaO system for thermochemical heat storage at high temperatures.

Can redox materials store solar energy?

Although it has lower energy storage capacity compared with Co 3 O 4 /CoO (844 kJ/mol) and CuO/Cu 2 O (811 kJ/mol), Ba-based redox materials can store solar thermal energy at the lowest capital cost among the redox pairs analyzed, based on a recent techno-economic assessment from Bayon et al. [22].

Does MgO increase reactivity of Bao 2 / Bao redox cycles?

Samples of BaO 2 with inert MgO support were synthesized by a new co-precipitation method. MgO was found to be an effective additive to improve the stability and reactivity of the BaO 2 /BaO redox cycle. Comparing samples with different MgO loading, it was shown that with increasing MgO content, the reactive stability of redox cycles improved.

Professor Jie Bao is a leading expert in Computer Process Control, focusing on improving the efficiency of energy-intensive industrial processes and developing integrated energy storage solutions that include industrial scale demand-side ...

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