

## Nanostructured graphite-induced destabilization of LiBH<sub>4</sub> for reversible hydrogen storage

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### ABSTRACT:

In this study, nanostructured graphite (nano-G) was added to LiBH<sub>4</sub> and examined with respect to its effect on the hydrogen storage properties of the system. Our study found that nano-G is an effective additive for promoting the reversible dehydrogenation of the LiBH<sub>4</sub>. A series of control experiments were carried out to optimize the sample preparation method, milling time and addition amount of nano-G. In comparison with the pure LiBH<sub>4</sub>, the LiBH<sub>4</sub>/nano-G composite prepared under optimized conditions exhibits enhanced dehydrogenation kinetics and improved cyclic stability. Particularly, after addition of LiH to the LiBH<sub>4</sub>/nano-G composite, the reversibility was further improved. A combination of phase/chemical state analyses has been conducted to gain insight into the promoting effect of nano-G on the reversible dehydrogenation of the LiBH<sub>4</sub>. Our study found that nano-G exerts its promoting effect via interaction with LiBH<sub>4</sub> and as grinding aid.