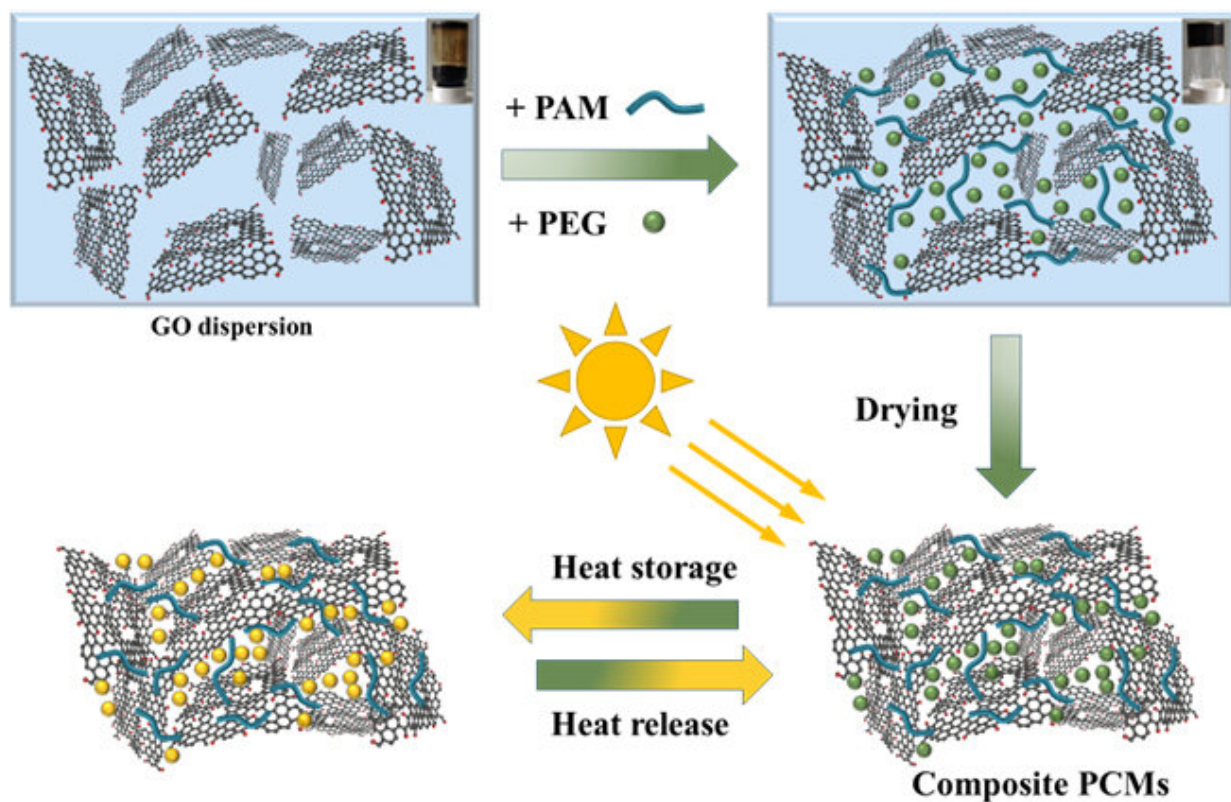


# Researchers propose one-step strategy to synthesize graphene-based composite phase change materials

September 29 2021, by Li Yuan



Schematic diagram of the PEG/GO-PAM composite PCMs synthesis. Credit: LI Yangeng

Graphene-based composite phase change materials (PCMs) exhibit great

potential in the field of solar-thermal energy conversion and storage.

Current synthesis methods of the [graphene](#)-based composite PCMs usually involve multi-step processes that are generally complicated, time- and energy-consuming, hindering its further practical application.

Recently, Prof. Shi Quan's group from the Dalian Institute of Chemical Physics (DICP) of the Chinese Academy of Sciences (CAS) proposed a facile and straightforward one-step strategy of constructing graphene-based shape-stable PCMs with [polyethylene glycol](#) (PEG) in situ filled into a [graphene oxide](#) (GO) network structure hydrogel.

This study was published in the *Chemical Engineering Journal* on Sept. 9.

Compared with the currently reported synthetic routes, the complexity, processing time and cost are reduced in this newly proposed strategy.

The as-prepared composite PCMs showed a high PEG loading capacity up to 95 wt.%, and could maintain a relatively constant phase change enthalpy of 162.8 J/g even after 1000 phase transition cycles.

The composites also exhibited excellent solar-thermal energy conversion ability, which could quickly convert [solar energy](#) into thermal energy and store it in the PCMs with a conversion efficiency of up to 93.7%.

**More information:** Yangeng Li et al, One-step synthesis of graphene-based composite phase change materials with high solar-thermal conversion efficiency, *Chemical Engineering Journal* (2021). [DOI: 10.1016/j.cej.2021.132439](https://doi.org/10.1016/j.cej.2021.132439)

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