

Dual latent heat storages

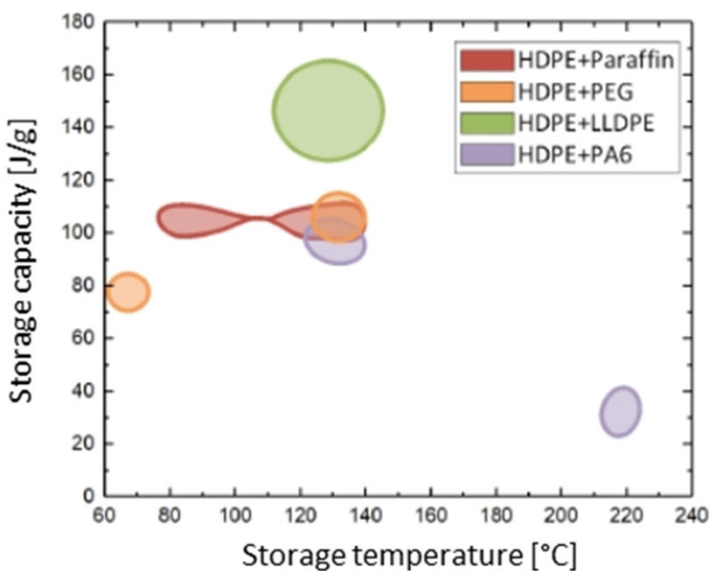
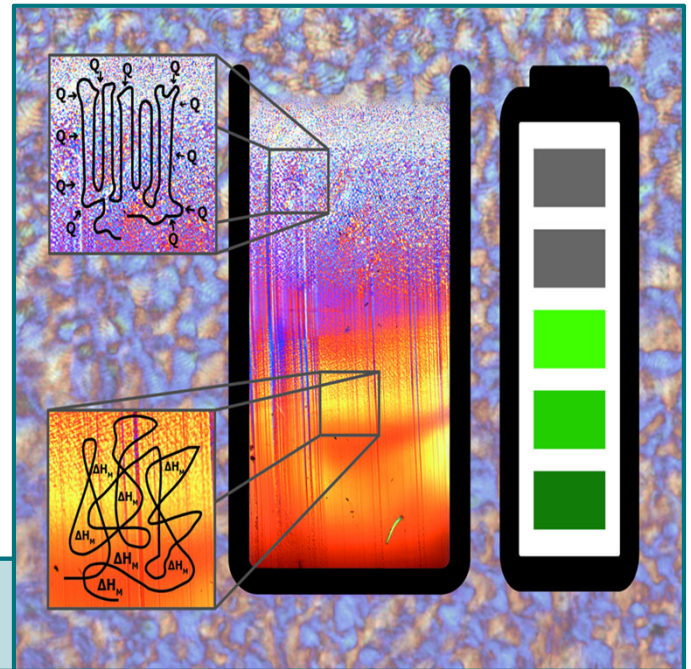
Katharina Resch-Fauster

Multifunctional polymers for the heat storage technology of the future

Latent heat storage systems (see Fig. 1) represent a now established, particularly powerful and innovative variant for heat storage or temperature regulation. Compared to other heat storage systems, they offer a high density of storage capacity with long storage times and low energy loss. In the present research work, latent heat storage systems based on semi-crystalline polymers are developed, which have at least two storage temperatures (dual systems). This is achieved by combining semi-crystalline polymers with other semi-crystalline polymers and/or phase change materials with different melting temperatures.

Fig. 1

Thermal energy Q is stored and released during the melting/crystallization of semi-crystalline polymers; the heat of fusion ΔH_M corresponds to the polymer's storage capacity.



Special focus is placed on the investigation of their thermo-physical properties and long-term stability under application-relevant loading conditions. Initial results show that this is not only possible, but that dual systems have advantages over single materials in terms of thermo-oxidative long-term stability (see Fig. 2). The main project results are expected to be innovative new materials for the heat storage technology of the future as well as extensive expertise in the field of material design and functionalization.

Fig. 2

Storage capacity and temperatures of dual latent heat storages based on various polymeric materials.



KATHARINA RESCH-FAUSTER

Materials Science and Testing of Polymers
katharina.resch-fauster@unileoben.ac.at

RESEARCH FOCUS: sustainable energy production and storage, green engineering, polymers and composites based on renewable resources, second-life options for polymers

PROJECT: basic university research