

Abstract

The present invention relates to the field of phase-change materials, and specifically relates to a composite aerogel, a recyclable heat-storage phase-change composite material with a photothermal conversion function, and preparation methods therefor and the use thereof. The composite aerogel comprises a polymer and graphene, wherein the polymer contains a maleic-anhydride-group-containing structural unit and a maleimide-group-containing structural unit. The composite aerogel can be used as a carrier to load a phase-change material, so as to obtain a recyclable heat-storage phase-change composite material, which has a photothermal conversion function and can also be recycled by using a simple and environmentally friendly method. The recyclable heat-storage phase-change composite material comprises a composite aerogel and a phase-change material loaded in the composite aerogel. The recyclable heat-storage phase-change composite material with a photothermal conversion function of the present invention not only has a photothermal conversion function, but is also low in terms of leakage of the phase-change material and can also be recycled, such that the environmentally friendly utilization and effective storage of solar energy are truly realized, and the material has a high application value in the aspect of utilizing clean energy in an environmentally friendly manner.