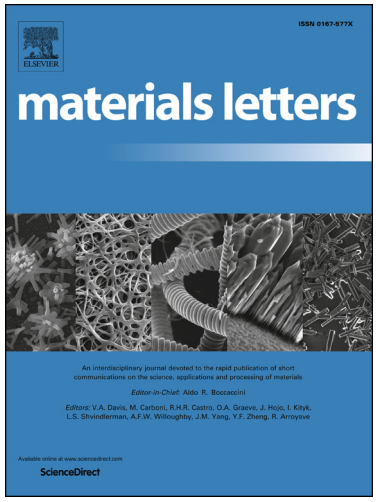

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Fabrication and characterization of phase change composite materials via xylitol infiltrating aligned alumina template

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Abstract: The phase change composite materials (PCCMs) were firstly fabricated via xylitol infiltrating aligned alumina template (AT). Scanning electron microscopy (SEM), differential scanning calorimetry and thermogravimetric analysis (DSC-TG) were used to investigate the microstructures and phase change characteristics. The high viscosity melting xylitol can be completely infiltrated into the micron-level parallel pore channels AT, which is an effective method to obtain shape-stabilized PCCMs.

Keywords: phase change composite materials; xylitol; aligned alumina template; infiltration; thermal properties; porous materials

1. Introduction

Solid-liquid phase change materials (PCMs) are provided with great significance for improving energy utilization efficiency due to their high heat storage density, and can been applied in many fields, such as solar energy device [1], thermal management system [2], textile and clothing [3], building wall [4], and so on. Among of them, organic PCMs are promising low temperature latent heat storage materials in the temperature range from -5 ℃ to 190 ℃ [3,5-7]. During the course of solid-liquid