

THERMAL PROPERTIES OF ERYTHRITOL-CONTAINING CARBON FOAMS

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Introduction

Erythritol is a phase change material and stores heat energy in the form of latent heat. However, erythritol is that the latent heat loss occurs when repeated experiments. Therefore, a storage device is needed to reduce latent heat loss. The storage device used in this study is a carbon foam with a three-dimensional porous structure.¹⁻³

Materials and Methods

The produced carbon foam was obtained by carbonizing carboxymethyl cellulose, which is an eco-friendly material, at 1000 ° C, and a carbon foam was impregnated with erythritol using a vacuum device to obtain a sample.⁴

The obtained samples were subjected to latent heat analysis using DSC equipment, and 10 repeated experiments were performed to observe latent heat change.¹

Results and Conclusions

In the case of pure erythritol, the melting temperature was 121.74 ° C and the latent heat was measured as 358.04 J / g in the first cycle and 342.53 J / g in the 10th cycle. The difference is 15.51 J / g.

The melting temperature of the carbon foam containing erythritol was 125.80 ° C. The latent heat was 296.57 J / g for the first cycle and 291.77 J / g for the 10th cycle. The difference is 4.8 J / g.

The carbon foam was analyzed as a heat storage device to reduce latent heat loss.

Table 1. Latent heat repetition experiment using DSC

Latent Heat	First Cycle	10th Cycle	Difference
Pure	358.04	342.53	15.51
Add Carbon Foam	296.57	291.77	4.8

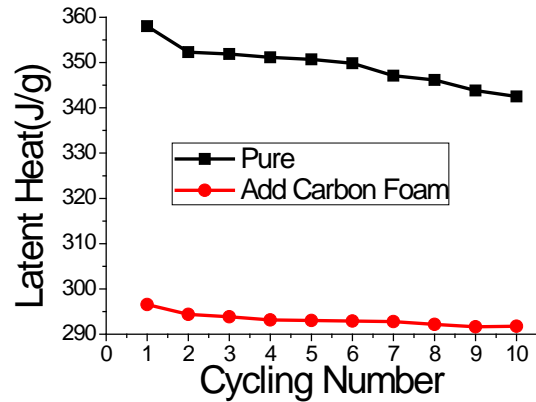


Figure 1. Graph of latent heat change according to cycling number

Acknowledgment

This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIP) (No. 2017R1A2B1008753). This research was also supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (No. 2016R1A6A1A03012069).

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