הטכניון - מכון טכנולוגי לישראל

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הפקולטה להנדסה כימית
ע"ש וולפסון
התוכנית הבין-יחידתית להנדסת פולימרים
The Wolfson Department of Chemical Engineering
The Interdepartmental Program in Polymer Engineering

Wolfson Department of Chemical Engineering Seminar in collaboration with the Interdepartmental Program in Polymer Engineering

Monday, April 28th, 2024 at 14:00

Room 6

Shape Stable Phase-change Material via Direct Incorporation of Salt Hydrate into a Polyolefin-based Organic Matrix

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M.Sc final seminar

Advisors: Prof. Charles eliezer Diesendruck

Interdisciplinary Program in Polymer Engineering, Technion-Israel Institute of Technology

In recent years, global energy demands, renewable energy sources and environmental aspects of traditional energy sources have drown significant attention from both industrial and academic research. Governments and the general population around the world recognize the impact of conventional non-renewable energy sources and treaties and regulations are written and published frequently. Therefore, the general trend in the world is to try to limit the use of combustible in favor of renewable energy sources. The problem with this trend is that renewable energy sources like solar and wind are inconsistent. To overcome this issue, energy storage devices are needed, and energy management strategies are essential. In this research, Salt hydrate was dispersed inside a LDPE based organic matrix in order to create shape stable phase change material which acts as thermal energy storage material. In my study, I focus on the strategy used to disperse a highly polar salt hydrate into the apolar organic matrix to form well defined domains which remain shape consistent. I describe also the ability of the material to effectively store and release the thermal energy in repeatable manner. The study shows the influence of different organic matrix compositions and, based on rheology and SEM tests, suggest a possible mechanism of the optimal composition.