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|  |  | הטכניון - מכון טכנולוגי לישראל  TECHNION - ISRAEL INSTITUTE OF TECHNOLOGY |
| הפקולטה להנדסה כימית  ע"ש וולפסון |  |  |
| The Wolfson Department of Chemical Engineering |  |  |

**Wolfson Department of Chemical Engineering Seminar**

**Monday, February 1st, 2021 at 17:00**

**Online seminar via Zoom**

[https://technion.zoom.us/j/93319981911](https://www.google.com/url?q=https%3A%2F%2Ftechnion.zoom.us%2Fj%2F93319981911&sa=D&ust=1611072177258000&usg=AOvVaw2kgyqwJDxU-SXSEuvFGEND)

**Developing a long-term polymeric controlled release system**

**Eden Bitkover**

**MSc Seminar**

Advisor: Prof. Avi Schroeder

Department of Chemical Engineering, Technion-Israel Institute for Technology

The controlled release of contents from stimuli-responsive capsules is of interest to many fields ranging from medical uses to industrial purposes. These capsules are spatiotemporal and can be triggered in order to affect the release profile at the desired location and time. Traditionally, despite of all their useful benefits, most triggers have a short-termed release period and are temperature-dependent. We hypothesized that an independent controlled release system can be obtained and can function as an accurate chemical clock.

In this study we developed a new platform for sustained release using high-energy-waves-sensitive polymers. For this, we investigated encapsulation with different polymers and studied high energy degradation among them.

We found that homogenous capsules made of Polymethyl methacrylate and Polyvinylidene fluoride can be produced and used as carriers of organic liquids. These capsules can release their content when exposed to specific trigger that only depends on time. We can control the time of release by changing the capsule material, the capsule dimensions and the energy level and we can reach prolonged releasing periods. In addition, we present a mathematical model for predicting time of release.

These findings pave the way towards a development of fully independent controlled release system which can be used for medical and industrial purposes, mainly for cancer therapy and space industry uses.