Department of Materials Science and Engineering,

Master's Defense

Date & Time: June 5th at 10:00 a.m.
Where: https://drexel.zoom.us/j/95159655093

Title: Investigating the Effect of Sonication Power on the Formation and Structure of Crystalsomes

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Abstract

Crystalsomes are considered to have a shape symmetry incommensurate crystal structure where one of their lattice directions breaks from translational symmetry. Previous work on crystalsomes have demonstrated their unique structure allows for advantageous mechanical and biomedical properties that give promise to future use as a nano transporter. However, there are still several areas of crystalsome that still need to be examined in order to ensure that optimal performance is achieved. In this work, we will examine the effect that altering probe sonication power has on the formation of crystalsomes. The resultant crystalsomes will then be examined through scanning electron microscopy, differential scanning calorimetry, and gel permeation chromatography. Results from the experiments suggest there is a lower limit to the sonication power needed to form crystalsomes.

Next, we examine future experiments that build off the results of the aforementioned experiment. First, we briefly examine initial experimental data on altering the solvent used during crystalsome formation. Specifically, data from gel permeation chromatography and dynamic light scattering are examined to get a preliminary evidence of on how altering the solvent effects crystalsome formation. Finally, we examine initial permeability data for crystalsomes of varying sizes to optimize release properties for intravenous drug delivery.