Abstract Submitted
for the MAS21 Meeting of
The American Physical Society

Synthesis and Characterization of Polystyrene Nanocapsules[1]
SOPHIA TAYLOR, YURI CHUNG, UGOMMA UGWU-UCHE, LEAH CHEN, VERENI AMAYA APARICIO, ELENI HUGHES, Georgetown University — There has been a great deal of recent research on the synthesis and application of multi-component nanoparticles. Nanocapsules, which are nanoparticles with a liquid core and solid shell, are one example. These materials have shown promise in applications such as in pharmaceuticals and food additives. We have developed a series of nanocapsules using a method known as flash nanoprecipitation, in which a solution is rapidly mixed with a miscible non-solvent. We synthesized nanocapsules consisting of a polystyrene shell with a liquid core of a hexadecane. The nanocapsules were characterized using dynamic light scattering, atomic force microscopy, and scanning electron microscopy. We were able to determine how different compositions of the initial solution affects the resulting nanoparticles. We also investigated how the size of these particles change over time. We will discuss the synthesis of these particles and show that their formation can be described using a simple droplet model.

[1]Support for this research came from the NASA D.C. Space Grant

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Date submitted: 05 Nov 2021 Electronic form version 1.4