

## **Are lab-made research grade microplastics analogous to plastic consumer product degradation materials?**

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As the world continues to focus more on sustainable industrial practices, microplastics formation and environment interactions have become pressing topics in plastics research. Microplastics are gaining attention in the media and concerns for exposure/consumption of these particulates have increased due to the prevalence of plastics in our everyday lives. With this project, we aimed to design, test, and refine a method of fabricating lab-grade microplastics in various geometries, compositions, and sizes: to do this, we mimicked microplastics released from common consumer goods for the purpose of providing a method of microplastic fabrication to further research in the field. To ensure consistency between our lab made samples and those obtained from consumer products, microplastics from two products: tea bags and Tupperware containers were analyzed using polar optimized microscopy (POM) and environmental scanning electron microscopy (ESEM). To further compare the two types of microplastics, we wanted to determine if they would retain and leach their additives in the same manner. We used GC-MS (gas chromatography mass spectrometry) to analyze lab-grade samples with controlled amounts of bisphenol-A (BPA) to establish a baseline. The next steps of our project will include performing GC-MS on the leachate from the product microplastic to determine what additives they contain and in what concentrations. We will use this information to determine if our fabrication methods will produce an accurate representation of the microplastics that break off products and end up in the environment.