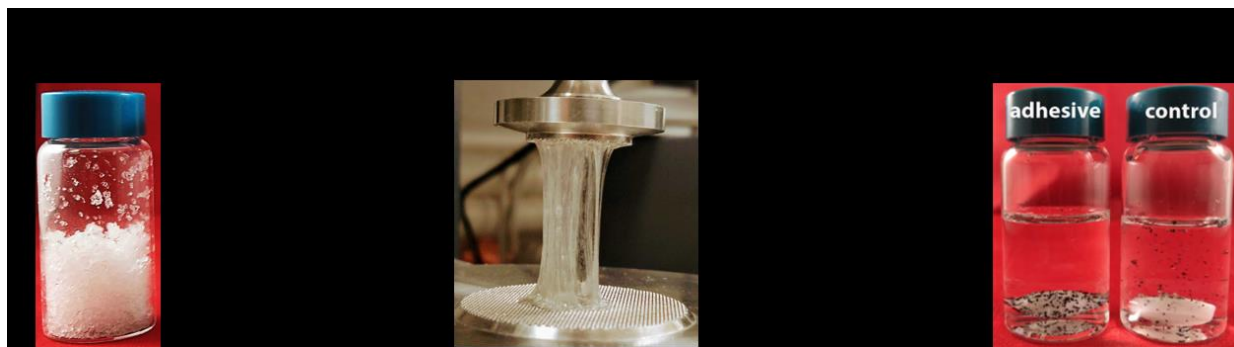


From diapers to adhesives: Open-loop recycling of post-consumer sodium poly(acrylate) via chemical modification

Paul Chazovachii¹, Michael Robo¹, Martin James², Dimitris Collias², Paul Zimmerman¹, Neil Marsh¹, and Anne McNeil¹

1. University of Michigan, Ann Arbor, Ann Arbor, Michigan, United States
2. Procter & Gamble Co, Cincinnati, Ohio, United States

Synthetic polymer products used in most consumer applications, like polyethylene, polyethylene terephthalate, and superabsorbent polymers (SAPs) are indispensable to our daily lives; however, their current sustainability profile requires significant improvement. Over 90% of the feedstocks used to access these types of polymers are derived from nonrenewable resources. Unfortunately, the chemical architectures that are desirable to confer high performance and durability (e.g., carbon-carbon backbones) are also responsible for the persistence of post-consumer polymers in the environment. In this work, the sodium polyacrylate based superabsorbent polymer (SAP) primarily used in disposable diapers is repurposed to make pressure-sensitive adhesives (PSAs). As a new direction, this work transitions into a novel application of these adhesives instrumental to microplastics capture in aqueous media.



Repurposing sodium polyacrylate based superabsorbent to make pressure-sensitive adhesives followed by microplastics capture in aqueous media.