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**Formation and Collapse of Biodegradable Polymer Monolayers at the Air-Water Interface** HAE-WOONG PARK, KIMBERLY OHN, YOU-YEON WON, Purdue University — Poly(lactide-*ran*-glycolide) (PLGA) is widely used as an excipient in formulations of aerosol drugs. It has recently been reported that the surface pressure-area isotherm of PLGA at the air-water interface shows a plateau at intermediate compression levels and a sharp rise in pressure upon further compression. In order to investigate the molecular origin of this behavior, we have conducted an extensive set of surface pressure and AFM imaging measurements with PLGA materials having a range of different molecular weights. The results suggest that (1) the plateau occurs due to the formation (and collapse) of a continuous water-free monolayer of the polymer under continuous compression, and (2) the monolayer becomes significantly resistant to compression at high compression because at that condition the collapsed domains become large enough to become glassy. We will also demonstrate that this property of PLGA allows the polymer to be used as an anchoring block to form a smooth biodegradable monolayer of block copolymers at the air-water interface.

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