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Baroplastic Block copolymers SHELDON A. HEWLETT, JUAN A. GONZALEZ LEON, JEFFREY A. BOROWITZ, ANNE M. MAYES, Massachusetts Institute of Technology — Block copolymers with rubbery and glassy components have been observed to have pressure induced miscibility. These microphase-separated materials, termed baroplastics, were able to flow and be processed at temperatures below the Tg of the glassy component by simple compression molding and extrusion. Diblock and triblock copolymers of polystyrene and poly(butyl acrylate) or poly(2-ethyl hexyl acrylate) were synthesized by atom transfer radical polymerization (ATRP) and processed at room temperature into well defined transparent objects. SAXS and SANS measurements demonstrated partial mixing between components as a result of pressure during processing. DSC results also show the presence of distinct domains even after several processing cycles. Their mechanical properties after processing were tested and compared with commercial thermoplastic elastomers.

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