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Elastic Properties of Bilayer Membranes Self-Assembled from Diblock Copolymers KYLE PASTOR, Department of Physics and Astronomy, McMaster University, Hamilton, Canada, JIANFENG LI, Department of Macromolecular Science, Fudan University, Shanghai 200433 China, AN-CHANG SHI, Department of Physics and Astronomy, McMaster University, Hamilton, Canada — The elastic properties of bilayer membranes are studied using self-consistent field theory (SCFT). The membranes are formed in a blend of AB diblock copolymers and C-homopolymers which act as the solvent. The free energy of a membrane is determined from the SCFT solutions. Fitting the membrane free energy to a continuum elastic model allows the determination of the bending and Gaussian modulus of the bilayers. More importantly, a comparison of the SCFT free energy and the Helfrich model can be used to determine the limit of the linear elastic model. A threshold curvature, at which the linear elasticity theory breaks down, is used to determine the validity region of the Helfrich model in the parameter space of the system.

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