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Line Tension of Multi-Component Bilayer Membranes ASHKAN DEHGHAN, KYLE PASTOR, AN-CHANG SHI, McMaster University, THEORETICAL POLYMER PHYSICS TEAM — The line tension of self-assembled multi-component bilayers is investigated using self-consistent field theory. The bilayer membranes are self-assembled from amphiphilic AB/ED diblock copolymers in a solvent modelled as C-homopolymers. We examine the effects of copolymer composition, geometrical shape and interactions on the line tension of bilayer membranes. Specifically, we calculate the line tension for membranes composed of symmetric, cone and inverse-cone shape amphiphilic molecules with neutral and/or repulsive E/D interactions. We show that an increase in the concentration of the cone shaped species results in a decrease in the pore line tension. In contrast, we found that adding inverse-cone shaped copolymers results in an increase in the line tension of the bilayer membrane. By examining the density profile of the membrane we determined that the different amphiphilic species phase separate within the membrane according to their local curvature. Our theoretical predictions are shown to be consistent with available experiments and theories.

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