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Different Transition Mechanisms and Tunable Wall Thicknesses of Block Copolymer Vesicles MENGYING XIAO, RONG WANG, DAIQIAN XIE, School of Chemistry and Chemical Engineering, Nanjing University — By using dissipative particle dynamics, we studied how to control the two pathways for vesicle-formation mechanism considering the hydrophobic/hydrophilic block ratio, polymer-solvent interaction, and polymer concentration. A crucial balance between the segregation of inner-hydrophobic beads and the attraction of outer-hydrophilic beads drastically affects the self-assembly pathways of amphiphilic block copolymer into vesicles from one mechanism over the other. And during the transition period between these two pathways, vesicles are formed through an in-between pathway. In addition, we have evaluated the thickness of the hydrophobic layer and observed two types of dependence on the vesicle size. Our results indicate that as the degree of hydrophobicity of the blocks increases, from the whole strong behavior to the whole weak behavior relationship, the transformation is observed in large sized vesicles first and then in small sized vesicles. Two characteristics, the chain compaction of the vesicles and the area densities of inner corona, are thought to be important in controlling the membrane thickness. **Acknowledgments.** This work has been supported by NNSFC (Nos. 20874046, 21074053 and 21133006) and NBRPC (No. 2010CB923303).

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