

Self-assemblies of Poly(α,β -dimethylaminoethyl aspartamide) grafted with double alkyl chain and their morphological transition between Micelles and Vesicles

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Amphiphilic copolymers, Poly(α,β -dimethylaminoethyl aspartamide) grafted with didodecylamine, were synthesized and their specific properties in aqueous solution with different DS (Degree of Substitution) were studied. Due to double alkyl chain structure, these systems showed stronger hydrophobic property compared with the one which has the same number of the single chain, and as a result worm-like micelles and vesicles were predominantly observed. However, these structures can be convertible mutually by changing environmental factors such as concentration, pH, etc. Micelle-to-vesicle transition was observed as the polymer concentration increased. On the other hand, vesicle-to-micelle transition was achieved as pH decreased because of the protonation of the amine group in the backbone. Here, we will report the effective method to control the morphologies of the amphiphilic polymers and also structure transition mechanism will be understood thoroughly.