Colloidal aggregates from elastin-like E50A40 diblock corecombinamer and DTAB surfactant

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The phenomenon known as “colloidal aggregation” may be defined as the process of floc or aggregate formation in a system consisting of a dispersed phase in a continuous phase or dispersant. This quite common phenomenon occurs in a wide range of fields inside the colloidal domain such as broad areas of biology, food technology, immunology, and petrochemistry, amongst others [1]. Polyanionic nanoparticles from E50A40 elastin-like diblock corecombinamer [2] and opposite charged cationic surfactant dodecyltrimethylamonium bromide (DTAB) were prepared by mixing the individual aqueous solutions. The structure of the nanoparticles was investigated as a function of DTAB concentration using Turbidimetry, Dynamic Light Scattering, Optical Microscopy, Zeta Potential, Transmision and Scanning Electron Microscopy, Differential Scanning Calorimetry and Atomic Force Microscopy. The neutralization of the anionic E blocks with cationic DTAB accompanied with the hydrophobic interaction of alkyl tails of DTAB led to formation of core-shell nanoparticles with the core of the neutral looped A hydrophobic blocks and the shell of the DTAB neutralized E hydrophilic blocks [3-5]. An increased of size was observed for our elastin-like diblock corecombinamer/cationic surfactant system when increasing amounts of surfactant was added to the solution due to the formation of flocs, that float and can be re-dispersed. Zeta potential was used to assess the likehood of flocculation. Dispersions with high Zeta potential repealed each other and resist flocculation, as also shown with the elastin-like E50A40 diblock corecombinamer in aqueous solution system. Meanwhile, those solutions with lower Zeta potential can overcome the repulsive charge to become strongly and reversible joined, as we found in the elastin-like diblock corecombinamer/cationic surfactant system as a consequence of the neutralization of the polyanionic corecombinamer charge caused by the incorporation of cationic surfactant molecules to the nanoparticle [6].