

pH & thermo-sensitive biodegradable block copolymers

심우선, 이두성*
성균관대학교
(dslee@skku.edu*)

The synthesis of various diblock (MPEG-PDLLA, MPEG-PCLA) and triblock (PCLA-PEG-PCLA) copolymers was performed through a ring-opening copolymerization of D,L- lactide and -caprolactone with MPEG (monomethoxy poly (ethylene glycol)) and PEG(poly (ethylene glycol)) as an initiator, respectively. The coupling reaction of the block copolymer and carboxylated sulfonamide (SA) as pH moiety was done by the 1,3-Dicyclo-hexylcarbodiimide(DCC). The carboxylated sulfonamide conjugated block copolymer shows the pH & thermo-sensitivity. Diblock (MPEG-PDLLA-SA, MPEG-PCLA-SA) is shown the micelle-demicelle behavior with the narrow pH range (pH 7.2-7.8). Also, triblock copolymer (SA-PCLA-PEG-PCLA-SA) is shown the sol-gel phase transition with pH & temperature change. Triblock copolymer solution (pH 8.0) flows at the room temperature (20°C). As this solution is injected into the buffer solution (pH 7.4, 37°C), the triblock copolymer hydrogel forms the gel in the buffer solution (pH 7.4, 37°C). But, triblock copolymer hydrogel doesn't form the gel in the buffer solution (pH 8.0, 37°C). These micelle and hydrogels are considered to be used as a good carrier for the protein & drug delivery.