

## Preparation of pH and Temperature Sensitive Biodegradable Block Copolymer Hydrogel

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Novel pH and temperature sensitive biodegradable block copolymers of sulfamehtazine oligomer-poly ( $\epsilon$ -caprolactone-co-lactide)-poly (ethylene glycol)-poly ( $\epsilon$ -caprolactone-co-lactide)-sulfamehtazine oligomer (OSM-PCLA-PEG-PCLA-OSM) were synthesized. The hydrogels composed of these block copolymers have shown the sol-to-gel transition behavior to not only temperature change but also pH change around the body condition (37 °C, pH 7.4). The sol-gel phase diagram of these hydrogels was modified by the controlling of PEG length, the ratio of hydrophobic block to hydrophilic block (PCLA/PEG ratio), and molecular weight of sulfamethazine oligomer. As the pH and temperature sensitive hydrogel cannot form the gel only by the temperature change, it can be employed as an injectable carrier using a long guide catheter into the body. Also, the pH of hydrogel was not changed by degradation of PCLA block for one month, and the gel was not collapsed by adding of buffer solution. These hydrogel properties are possible to be used as an injectable carrier for some protein drug denatured by low pH environment.