Control of pH- and Temperature-Responsive Behavior of mPEG-b-PDMAEMA Copolymers through Polymer Composition

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Smart polymers dramatically change properties in response to a small change in an external stimulus. Tuning of smart properties enables a wide range of possible applications from biomedical to oil and gas. This study describes how changing polymer structure directly affects the measured smart properties for the diblock copolymer mPEG-b-PDMAEMA. The observed smart behavior, specifically water solubility, depends on both pH and temperature. The solubility can be tuned by changing polymer composition and concentration to tailor this smart polymer material for applications ranging from DNA encapsulation to adaptable smart surfactants.