

Nanostructured surfaces

Synthesis, micelle formation and Au/Ag nanoparticle stabilization of thermo-responsive graft copolymers

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Poly (*N*-isopropylacrylamide), PNIPAM, having both hydrophilic amide groups and hydrophobic isopropyl groups in its side chains, is one of the most studied thermally sensitive (thermo-responsive) polymers, possessing a lower critical solution temperature, LCST, at 32 °C. The new series of thermo-responsive graft copolymers was prepared via polymerization of NIPAM with polymeric linoleic acid (PLina) and polymeric linolenic acid (PLinl) in order to obtain PLina-g-PNIPAM and PLini-g-PNIPAM graft copolymers. PLina/PLinl contents in the graft copolymers were calculated via elemental analysis of nitrogen in graft copolymers. DSC, TGA, SEM, TEM, FTIR, ¹³C NMR and ¹H NMR techniques were used in the characterization of the products. Graft copolymers swollen in water were investigated by means of swelling-deswelling kinetics against to temperature change [1,2]. Metal nanoparticles such as gold and silver inserted polymeric materials obtained new polymeric composite materials having different mechanic, thermal, optic, magnetic and electronic features. Among many nanoparticles, gold and silver have recently received a great attention in the bio-related field because of its possibility for medical or biological applications. Metal nanoparticles were prepared metal salts holding on to carboxyl and amine groups and than reduced NaBH₄.

1. Allı A., Hazer B., Synthesis and Characterization of Poly(*N*-Isopropyl Acryl Amide)-g-Poly(Linoleic Acid)/Poly(Linolenic Acid) Graft Copolymers // Journal of the American Oil Chemists Society.-2011.-**88**. N 2.-P. 255-263.
2. Allı A., Hazer B., Poly(*N*-isopropylacrylamide) thermoresponsive crosslinked conjugates containing polymeric soybean oil and/or polypropylene glycol // European Polymer Journal.-2008.-**44**.-P. 1701-1713.