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Precious metal nano composites based on autoxidized unsaturated plant oils/fatty acids

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Unsaturated plant oils/fatty acids (UPOFA) have gained great interest as monomers to produce bio based polymers. UPOFA is prone to react with air oxygen under daylight at room temperature which is called "ecofriendly autoxidation". Eco-friendly autoxidation process creates peroxide linkages in order to obtain unsaturated plant oil/fatty acid polymer that can initiate the free radical copolymerization of some vinyl monomers. In addition, water soluble hydroxylated plant oil and nano composite materials are synthesized using autoxidized unsaturated plant oils/fatty acids (AUPOFA). Autoxidized oleic acid macroperoxide initiated the free radical polymerization of styrene in order to obtain carboxyl functionalized polystyrene for further modification reactions. In this manner, polyethylene glycol with amine terminal groups were reacted with this polymer. Multi block amphiphilic copolymer was used to stabilize inorganic nanoparticles to obtain organic/inorganic nanocomposites.

Catalyst effect of gold NPs is dramatically decreased the eco-friendly autoxidation time. For example the gold catalyzed autoxidized soya oil polymer was obtained in ten days oxidation period while the autoxidation time takes nearly one month to obtain oxidized soya oil polymer without Au NPs. Similarly, high fluorescent emission of silver/oxidized soybean oil polymer nanocomposite is obtained. The nanocomposite solutions were analyzed by UV-VIS spectrometer in view of the surface plasmon resonance. TEM was used to characterize size and shape of the metal nano particles embedded into the copolymer nano composites.

Biography

Baki Hazer received his M.S. and B.S. degrees in chemical engineering from the College of Chemical Engineering, University of Istanbul, in 1972 and his PhD degree from Karadeniz Technical University, in 1978. He received the Royal Society of Chemistry and TÜBİTAK joint research grant at the Liverpool University in the United Kingdom. He received the NATO Collaborative Research Grant at the Department of Polymer Science and Engineering, University of Massachusetts, Amherst in 1995–1997, and was Fulbright Visiting Professor at the same department in 1992–1993. He was a Visiting Scientist at The University of Akron in 2007. He had an honorary membership by the Turkish Chemical Society in May 2005. He is a Member of the Turkish Chemical Society and Member of the Editorial Boards of Hacettepe Journal of Biology and Chemistry and Journal of Clinical Rehabilitative Tissue Engineering Research (CRTER). He is specialized in soybean oil polymers and post polymerization reactions, nanocomposite synthesis, bacterial polyesters, block and graft copolymers, macro monomeric initiators, controlled leaving polymerization, and thermoresponsive polymers.

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