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Gelatin-Coated Magnetite Nanoparticles for Drug Delivery System

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Drug delivery is the method of administering a pharmaceutical compound to achieve a therapeutic effect in humans based on the drug safety and efficacy at the targeted therapies. The pharmaceutical agents or drugs of interest are entrapped within, or attached to an organic polymer matrix or inorganic particle. Magnetic nanoparticles (MNPs), one of the inorganic nanoparticles, can be manipulated by external magnetic field to lead it to the target tissue. The therapeutic agents are attached to, or encapsulated within, a magnetic nanoparticle by polymer coating. This work aims to synthesize magnetite nanoparticle (Fe_3O_4-NP) via the bio-chemical co-precipitation under using gelatin as biomaterial templates for cancer drug carrier. The cancer drug is attached to the Fe_3O_4-NP through a functional group between the gelatin and the drug. The Fe_3O_4-NP morphology with and without drug attaching were spherical in the size of 24-28 nm. The magnetization and the electrical conductivity decreased after attaching the drug. However, the gelatin-coated Fe_3O_4-NP was suitable for cancer drug carrier because it can response to an external magnetic field and provided suspension stability.

Biography

Anuvat Sirivat obtained B.S. in 1977, M.E. in 1978 followed by Ph.D. in 1983 all in Mechanical Engineering, from Cornell University, USA, and later completed a Postdoctoral study in Chemical Engineering in 1985 from Johns Hopkins University. Currently, he is a Professor of Polymer Engineering at Petroleum and Petrochemical College, Chulalongkorn University, Thailand. He is supported by many Royal Thai Government grants related to Conductive and Electroactive Polymers. His research interests are: conductive and electroactive polymers; rheology, stability, transition, and turbulence of complex fluids; and light scattering.

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