

Polyaniline/LDHs nanocomposite: Preparation, morphology, thermal and electrical properties

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Zn/Al-layer double hydroxides (Zn/Al-LDHs) with 2:1 Zn/Al ratio was prepared by heterocoagulation and modified using different anionic surfactants e.g, sodium dodecyl sulfate (DS) and sodium dodecyl benzene sulfonate (DBS), nitrates in the interlamellar space of LDHs was exchanged through excellent anion exchange capacity by DS and DBS. Both hydrophilic and hydrophobized Zn-Al layered double hydroxide were applied as inorganic filler in free emulsion polymerization of aniline monomer. The morphology of the LDHs as well as the prepared nanocomposites was characterized by transmission electron microscope (TEM) and scanning electron microscope (SEM). The X-Ray diffraction (XRD) confirmed the formation of LDHs and totally delaminated into the polymer matrix. The thermal properties were studied by differential scanning calorimetry (DSC) and thermogravimetric analysis (TGA). Furthermore, the surface area of the prepared nanocomposites were investigated by BET and increased by addition of LDHs compared by neat polyaniline. The electrical conductivity of the prepared nanocomposites was investigated by increasing the ratio of LDHs in the nanocomposite. This work deals with potential applications of these materials, including ion exchange/adsorption, electrochemistry, UV production and conductive coating.

Biography

Ahmed M. Youssef has completed his Ph.D. at the age of 29 years from Ain Shams University, Egypt and postdoctoral studies from Arkansas University, USA. He is the Research Associate Professor at Packing and Packaging materials Department, National research Center, Cairo, Egypt. He has published more than 30 papers in reputed journals and serving as an Organizing Committee Member of several International Conferences.

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Novel supiride loaded solid lipid nanoparticles with enhanced intestinal absorption

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Sulpiride is a dopamine antagonist antipsychotic drug that belongs to class four according to the Biological classification System. The aim of this work was to enhance the intestinal permeability by loading into solid lipid nanoparticles (SLN).

Simply, the drug and the melted lipids were dispersed in aqueous solution of a surfactant at a temperature 10°C higher than the melting points of the lipids using probe-sonication. The formed emulsion was simultaneously dispersed in cold water and the SLN were collected after freeze-drying. Number of formulation factors and process variables were optimized including the drug to lipid ratio, the type of lipids and the type and concentration of surfactants. The produced SLN were evaluated for their particle size, surface charges, entrapment efficiency, crystallinity of the drug and lipids, and the drug release profile. The intestinal permeability of SLN loaded sulpiride was compared with a control using inverted sac animal model.

The results showed that the adopted method allowed successful preparation of SLN with particle size between 147.8 to 298.8 nm. The SEM and AFM images showed uniform spherical particles and confirmed the sizes determined by the light scattering technique. The combination of triglycerides with stearic acid resulted in tremendous increase in zeta-potential, entrapment efficiency, and drug loading; however the particle size was increased. The type of surfactant was critical for the particle size and charge and drug loading and entrapment efficiency. The inverted sac model revealed a tremendous enhancement in the sulpiride permeability in the case of SLN loaded formulae.

Biography

Alaa Eldeen Bakry Yassin is a professor of pharmaceutics at king Saud bin Abdulaziz University for health care, Riyadh, Saudi Arabia. His research interests focus on oral drug delivery with emphasis on colonic and gastroretentive systems, in addition to nanoscale systems (solid lipid, polymeric nanoparticles, and micelles) for the delivery of anticancers. He is the recipient of the teaching Excellency and research Excellency awards from KSU (2009). Dr. Yassin has obtained his Ph.D. degree in Pharmaceutics through the University of Wisconsin-Madison in 1996 under the supervision of Prof. Joseph Robinson. He has more than 40 publications and international conference presentations.

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