The International Debate on Synthesis and Characterization of Smart Hydrogels Containing Graphene Nanosheets and Magnetic Nanoparticles for Drug Delivery Applications

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Hydrogel -based nanocomposites are relatively a new class of materials that have attracted great attention s in medical science s due to their superior physical and biologic al properties including high amount of water preservation, high drug -loading ability, biocompatibility, and similar structure to extracellular matrix (ECM) The aim of this study is to develop sensitive hydrogels based on Pluronic -chitosan/graphene nanosheets / magnetic nanoparticles for drug delivery into cancerous cells. The morphology, physical and chemical properties of the hydrogel-based nanocomposites were characterized by TEM /SEM, FTIR, VSM, DLS, and XRD techniques. Based on the TEM images, particle size of spherical Fe_3O_4 nanoparticles formed via a wet-chemical precipitation method is about 60 nm, confirming the particle size distribution observed through DLS results (66 nm). Additionally, porous structure of the nanocomposites with pore sizes about 150-180 μm is clear in the SEM micrographs. Drug release studies of alga extraction, which is known as an anti-cancer drug, also exhibit ed that mechanism of drug release belongs to a zero-order kinetics, and only 35% of the drug released during a 7-day period. As a result, the as-developed hydrogel nanocomposites can be introduced as an appropriate substrate for controllable drug delivery into cancerous cells.

Biography:

Azadeh Tohidi held a master's degree in engineering materials from the Sharif university of technology, International campus, Iran,2017. Her research interest is in synthesis and characterization of hybrid smart nano hydrogel with ability of drug release and her other project center around nano sensors in textile industry and super hydrophobic coating.