Research & Reviews: Journal of Pharmaceutical Analysis

Extended Abstract
Vol. 9, Iss. 1
2020

Biopolymer Congress 2018: Fabrication of reduced graphene oxide-based conductive film for controlled drug delivery applications - Didem Aycan - Research Assistant Marmara University

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Nowadays, conductive polymeric materials have been researched extensively and showed great potential for biomedical applications due to the unique properties such as cost effectiveness, strong biomolecular interactions, electrochemical and oxidative stability. They have been widely used in drug delivery systems, biosensors, tissue engineering scaffolds, and neural implants, since their conductive nature allows the stimulation of cells cultured upon them through the application of electrical signal. In this context, novel composite film composed of biopolymers and conductive inorganic additives such as graphene (G), graphene oxide (GO), and reduced graphene oxide (RGO) has been especially preferred owing to some advantages including high electric conductivity at room temperature, excellent mechanical flexibility, long term environmental stability, good electrochemical activity, biocompatibility of biopolymers and also brilliant chemical properties. Herein, RGO-based conductive films were fabricated by incorporation of different amount of RGO into the polymeric network which contains gelatin (Gel), sodium alginate (SA) and hyaluronic acid (HyA) by using a solvent-casting method. The obtained polymeric films were loaded with a model drug and the release kinetic of the drug from the composite film was investigated under the different voltage values. The obtained results assured that RGO-based conductive films could be used as an electro-responsive drug carrier in the future applications

Graphene, a 2D sheet of carbon atoms arranged in a grid, is a fascinating material which has many interesting properties such as mechanical resistance, thermal and electrical conductivity, properties. Graphene is the subject of vigorous R&D, but its high price tag is currently an obstacle. Graphene oxide is a form of graphene which contains oxygen functional groups and interesting properties which may be different from those of graphene. By demanding the graphene oxide, these oxidized functional groups are eliminated, to obtain a graphene material. This graphene material is called reduced graphene oxide, often abbreviated as rGO.

rGO can be obtained from GO via a discount. This can be accomplished by electrochemical reduction, chemical reduction and thermal reduction (16, 36, 39–43). Each process has its merits and disadvantages. But the ultimate objective is the same, that is to say, eliminate oxygen groups and repair GO faults to the long-range conjugate network of GP and thus restore the conductivity. In most cases, rGO is a better WE modifier for ECS than GO and GP, because it contains both negatively charged GO groups as well as the superb conductive properties of the GP

Almost all modern portable and domestic electronic devices are powered by optoelectronics which utilize Large Desk Transparent Transducers (TCF) composites, such as touch screens and organic LED displays. A colloidal suspension of the form of graphene oxide (GO) is not only scalable for mass production but also compatible with emerging technologies based on flexible substrates. This article reviews the GO suspension using TCFs synthesized for current state-of-the-art developments and future prospects. In addition, several established approaches have been organized, GO based TCFs of optoelectric performance. They include chemical doping

This work is partly presented at 8th World Congress on Biopolymers & Bioplastics on June 28-29, 2018 at Berlin, Germany

treatments, the use of large GO sheets and hybrids with other nanostructured materials, such as carbon nanotubes (CNT), metallic nanowires (NW) or. GO based TCFs of optoelectric performance have many established approaches. They include chemical doping treatments, the use of large GO sheets and hybrids with other nanostructured materials, such as carbon nanotubes (CNT), metallic nanowires (NW) or. GO based TCFs of optoelectric performance have many established approaches. They include chemical doping treatments, the use of large GO sheets and hybrids with other nanostructured materials, such as carbon nanotubes (CNT).

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