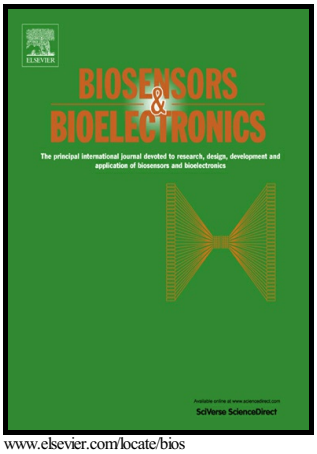


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# A Facile Synthesis of 3D $NiFe_2O_4$ Nanospheres Anchored on a Novel Ionic Liquid Modified Reduced Graphene Oxide for Electrochemical Sensing of Ledipasvir: Application to Human Pharmacokinetic Study

Mohamed M. El-Wekil[*1], Ashraf M. Mahmoud[1,2], Saad A. Alkahtani[2],Adel A. Marzouk[3], , Ramadan Ali[4]

[1] Department of Pharmaceutical Analytical Chemistry, Faculty of Pharmacy, Assiut University, Assiut, Egypt.

[2] Department of Pharmaceutical chemistry, College of Pharmacy, Najran University, Kingdom of Saudia Arabia

[3] Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Al Azhar University, Assiut, Egypt.

[4]Department of Pharmaceutical Analytical Chemistry, Faculty of Pharmacy, Al Azhar University, Assiut, Egypt.

* Corresponding author: Mohamed.mohamoud@ymail.com*



## ABSTRACT

Novel and sensitive electrochemical sensor was fabricated for the assay of anti-HCV ledipasvir (LEDV) in different matrices. The designed sensor was based on 3D spinel ferromagnetic $NiFe_2O_4$ nanospheres and reduced graphene oxide (RGO) supported by morpholinium acid sulphate (MHS), as an ionic liquid (RGO/NS$NiFe_2O_4$/MHS). This sensor design was assigned to synergistically tailor the unique properties of nanostructured ferrites, RGO, and ionic liquid to maximize the sensor response. Electrode modification prevented aggregation of $NiFe_2O_4$, increasing electroactive surface area and allowed remarkable electro-catalytic oxidation of LEDV with an enhanced oxidation response. Differential pulse voltammetry was used for detection LEDV in complex matrices whereas; cyclic voltammetry and other techniques were employed to characterize the developed sensor properties. All experimental factors regarding sensor fabrication and chemical sensing properties were carefully studied and optimized. Under the optimum conditions, the designated sensor displayed a wide