Journal of Oncology Research
Research Article

Nano Molecules Incorporation into the Nano Polymeric Matrix (NPM) by Immersion of the Nano Polymeric Modified Electrode (NPME) as Molecular Enzymes and Drug Targets for Human Cancer Cells, Tissues and Tumors Treatment under Synchrotron and Synchrocyclotron Radiations

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Received: 5 July 2018**; Accepted:** 30 July 2018**; Published:** 3 August 2018

Abstract

In the current study, we study C_{70}–Carboxyfullerenes Nano molecules (Figure 1) incorporation into the Nano Polymeric Matrix (NPM) by immersion of the Nano Polymeric Modified Electrode (NPME) as molecular enzymes and drug targets for human cancer cells, tissues and tumors treatment under synchrotron and synchrocyclotron radiations.

Keywords: C_{70}–Carboxyfullerenes Nano Molecules; Nano Polymeric Matrix (NPM); Immersion; Nano Polymeric Modified Electrode (NPME); Molecular Enzymes; Drug Targets; Human Cancer Cells; Tissues and Tumors; Treatment, Synchrotron Radiations; Synchrocyclotron Radiations

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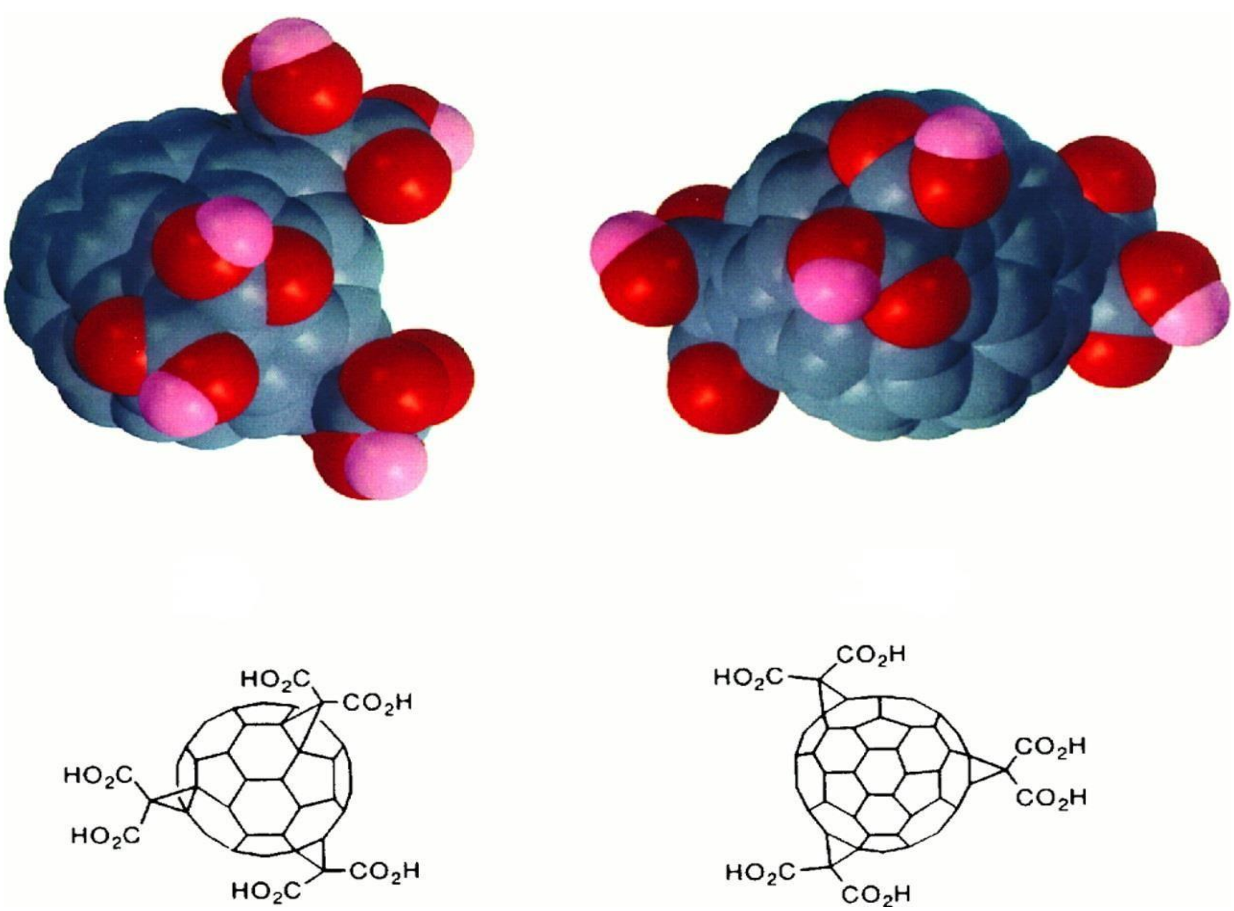
Introduction

In the current study, we study C_{70}–Carboxyfullerenes Nano molecules (Figure 1) incorporation into the Nano Polymeric Matrix (NPM) by immersion of the Nano Polymeric Modified Electrode (NPME) as molecular enzymes and drug targets for human cancer cells, tissues and tumors treatment under synchrotron and synchrocyclotron radiations. In this regard, the development of Chemical Modified Electrodes (CEMs) is at present an area of great interest. CEMs can be divided broadly into two main categories; namely, surface modified and bulk modified electrodes. Methods of surface modification include adsorption, covalent bonding, attachment of polymer Nano films, etc. Polymer Nano film coated electrodes can be differentiated from other modification methods such as adsorption and covalent bonding in that they usually involve multilayer as opposed to monolayer frequently encountered for the latter methods. The thicker Nano films imply more active sites which lead to larger analytical signals. This advantage coupled with other, their versatility and wide applicability, makes polymer Nano film modified electrodes particularly suitable for analytical applications [1–27].

Figure (1): Molecular structure of C_{70}–Carboxyfullerenes Nano molecules.



Materials, Research Methods and Experimental Techniques

Electrochemical polymerization offers the advantage of reproducible deposition in terms of Nano film thickness and loading, making the immobilization procedure of a metal–based electrocatalyst very simple and reliable for C_{70}–Carboxyfullerenes Nano molecules incorporation into the Nano Polymeric Matrix (NPM) by immersion of the Nano Polymeric Modified Electrode (NPME) as molecular enzymes and drug targets for human cancer cells, tissues and tumors treatment under synchrotron and synchrocyclotron radiations. Also, it must be notice that the nature of working electrode substrate in electropreparation of polymeric Nano film is very important, because properties of polymeric Nano films depend on the working electrode anti–cancer Nano materials. The ease and fast preparation and of obtaining a new reproducible surface, the low residual current, porous surface and low cost of Multi–Walled Carbon Nanotubes (MWCNTs) paste are some advantages of Carbon Paste Electrode (CPE) over all other solid electrodes [28–92].

Results and Discussion

On the other hand, it has been shown that, macrocyclic complexes of C_{70}–Carboxyfullerenes Nano molecules are interest as modifying agents because in basic media C_{70}–Carboxyfullerenes Nano molecules redox centers show high catalytic activity towards the oxidation of small organic anti–cancer Nano compounds. The high–valence species of C_{70}–Carboxyfullerenes Nano molecules seem to act as strong oxidizing agents for low–electroactivity organic substrates. 1,2–Dioxetane (1,2–Dioxacyclobutane), 1,3–Dioxetane (1,3–Dioxacyclobutane), DMDM Hydantoin and Sulphobe as the anti–cancer organic intermediate products of methanol oxidation as well as formic acid, is important to investigate its electrochemical oxidation behavior in C_{70}–Carboxyfullerenes Nano molecules incorporation into the Nano Polymeric Matrix (NPM) by immersion of the Nano Polymeric Modified Electrode (NPME) as molecular enzymes and drug targets for human cancer cells, tissues and tumors treatment under synchrotron and synchrocyclotron radiations [93–169].

Conclusions, Perspectives, Useful Suggestions and Future Studies

In this work, we decided to combine the above mentioned advantageous features for the aim of C_{70}–Carboxyfullerenes Nano molecules incorporation into the Nano Polymeric Matrix (NPM) by immersion of the Nano Polymeric Modified Electrode (NPME) as molecular enzymes and drug targets for human cancer cells, tissues and tumors treatment under synchrotron and synchrocyclotron radiations. Furthermore, in this investigation, we prepared poly Nano films by electropolymerization at the surface of Multi–Walled Carbon Nanotubes (MWCNTs) paste electrode. Then, C_{70}–Carboxyfullerenes Nano molecules were incorporated into the Nano Polymeric Matrix (NPM) by immersion of the Nano Polymeric Modified Electrode (NPME) in a solution. The modifier layer of C_{70}–Carboxyfullerenes Nano molecules at the electrode surface acts as a Nano catalyst for the treatment of human cancer cells, tissues and tumors under synchrotron and synchrocyclotron radiations. Suitability of this C_{70}–Carboxyfullerenes Nano molecules–modified polymeric Multi–Walled Carbon Nanotubes (MWCNTs) paste electrode toward the electrocatalytic treatment of human cancer cells, tissues and tumors under synchrotron and synchrocyclotron radiations in alkaline medium at ambient temperature was investigated.

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