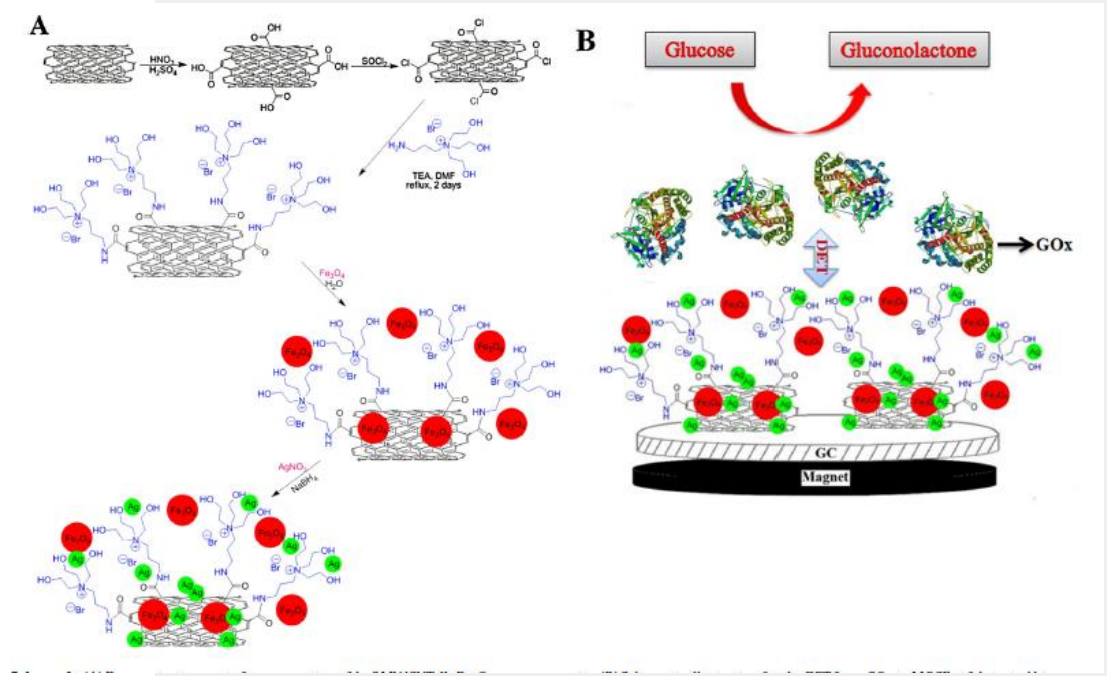
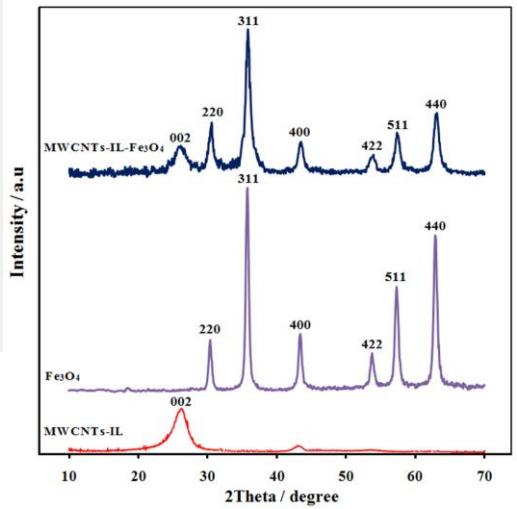
Amperometric glucose biosensor based on immobilization of glucose oxidase on a magnetic glassy carbon electrode modified with a novel magnetic nanocomposite



Demonstration route for preparation of Ag@MWCNT-IL-Fe3O4 nanocomposite



XRD patterns of MWCNT-IL, Fe3O4 NPs and MWCNT-IL-Fe3O4

1. Objective of work

Develop a biosensor for detection of glucose level on a biological sample. The electrodes, magnetic glassy carbon, contains the nanocomposite Ag@MWCNT-IL-Fe_3O_4 to obtain a better electrical signal from the electron transfer in the Redox reaction of Glucose oxidase (GOx).

2. Sample description

MWCNT-IL-Fe_3O_4 nanocomposite was prepared as follows: 100 mg of synthesized Fe_3O_4 NPs were dispersed in 20 mL of H_2O. Then, the suspension was added into 500 mg of MWCNT-IL. The mixture was stirred and sonicated vigorously for 30 min. Finally, the suspension stirred with mechanical stimulus for 24 hr at room temperature. The nanocomposite was separated by magnet.

3. Equipment and conditions for X-Ray Diffraction

X-ray diffraction patterns were obtained on a powder X-ray diffraction system from PANalytical model X´Pert PRO.

4. Results

The diffraction peaks at values 30.42°, 35.76°, 43.33°, 53.80°, 57.37° and 62.98° can be indexed respectively to the (220), (311), (400), (422), (511) and (440) planes of the magnetite nanoparticles. The diffraction peak at 26.2° corresponds to 002 planes of MWCNTs. Based on the XRD patterns in the nanocomposite MWCNT-IL-Fe_3O_4, it can be concluded that the nanoparticles are well covered on the MWCNT-IL surface.