SUPPORTING INFORMATION

Graphene-based electrochemical competitive immunosensor for the sensitive detection of okadiac acid in shellfish

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Graphene-modified screen printed electrodes characterisation

X-ray photoelectron spectroscopy (XPS) measurements have been done for the bare GSPE in order to know the chemical composition and SEM measurements have also been performed to characterise the morphology of the electrodes.

1. X-ray photoelectron spectroscopy (XPS) measurments

The XPS measurements were performed at INRS-EMT ,Varennes, Quebec, Canada, with VG Escalab220iXL instrument using Mg polychromatic source (MgKα=1253.6 eV) at base pressure between 5×10^{-10} and 1×10^{-9} mbar. The survey spectra were recorded using 300 watts of X-ray power, 100 eV pass energy and1.0 eV step size. The high-resolution scans were run using power of 300 watts, 20eV pass energy and step size of 0.1 eV. The peak fits consist of a mix of Lorentzian and Gaussian distributions.

Figure S1 shows the typical XPS survey spectra of the bare GSPE. A strong C1s peak and a weak O1s peak were observed. The oxygen peak could be attributed to some oxygen atoms at the graphene edges. Figure S2 shows the high resolution of the C1s spectra of the bare GSPE. Four peaks were observed at binding energies of 284.6 which is assigned to the sp^2 hybridized carbon atoms of the graphene, 286.0 ev, 287.3 eV and 288.4 eV which corresponding to the C-O, C=O and O-C=O functional groups, respectively. These results confirm that the graphene used in this work is reduced form of graphene sheets as indicated by the manufacturer.

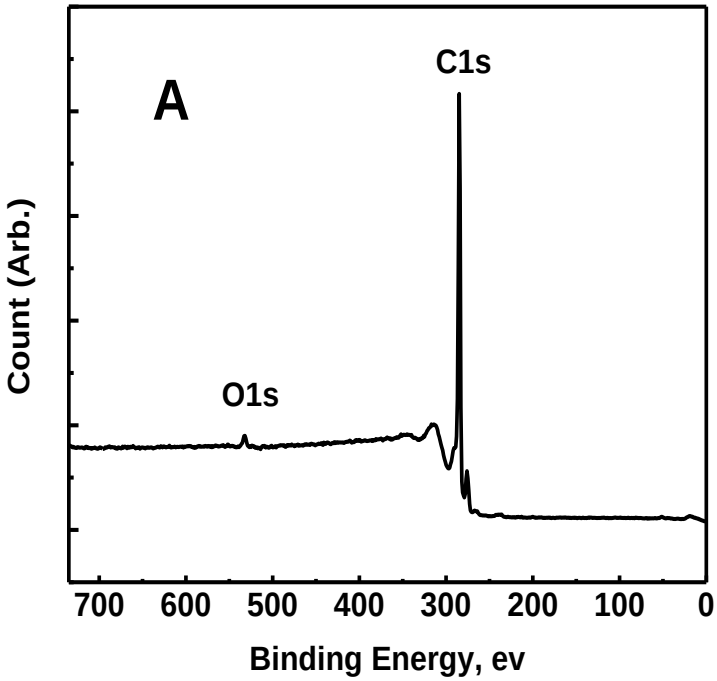

Figure S1. XPS survey spectra for bare GSPE

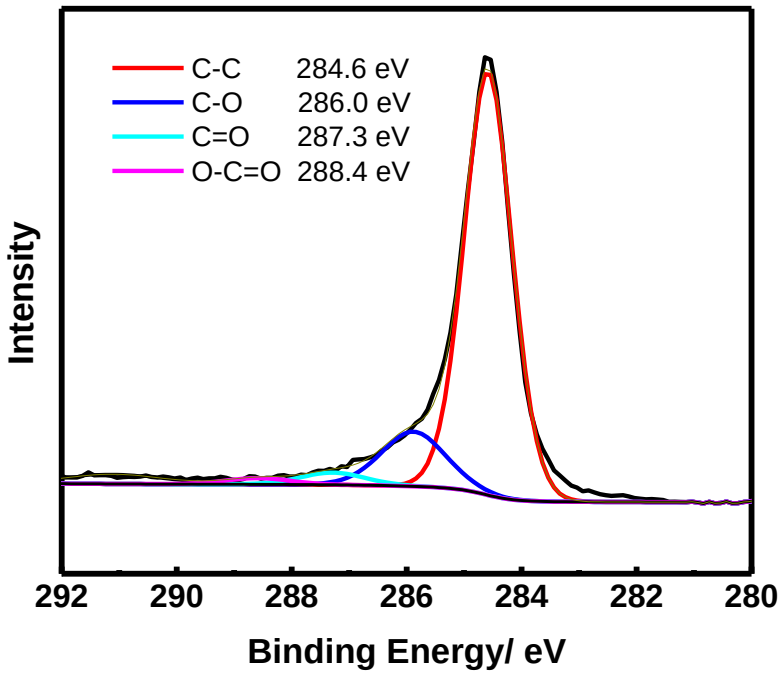

Figure S2**.** XPS C1s core level spectra for bare GSPE.

2. Scanning electron microscopy (SEM)

Scanning electron microscopy (SEM) image was obtained at INRS-EMT ,Varennes, Quebec, Canada using a JEOL, JSM 6300F apparatus.

Figure S3 shows the SEM image of the GSPE which clearly indicates well-packed graphene layered structure providing thin and homogeneous films. It is also possible to distinguish the edges of the individual thin sheets.

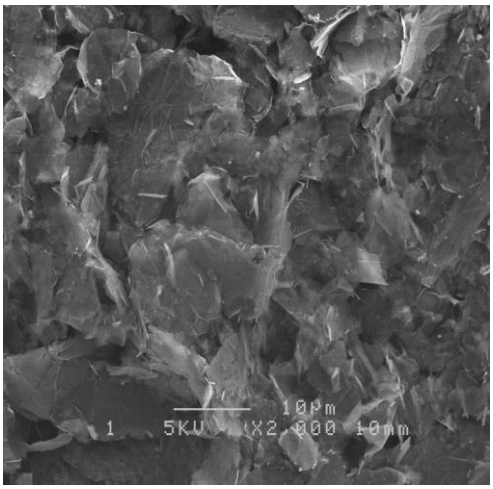

Figure S3**.** SEM image of bare GSPE.