Health	0
Flammability	0
Reactivity	1
Personal Protection	E

Technical Data Sheet

ACS Material Aminated Graphene Piperazine covalently linked

Table of contents

1 – Preparation Method

2 – Physical and Chemical Properties

3 – Application Fields

1. Preparation Method

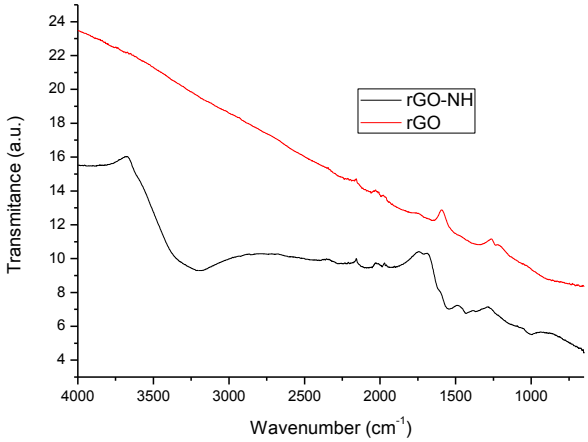
1) Prepare Graphene Oxide

2) Graphene oxide is modified by Piperazine

3) Reduced

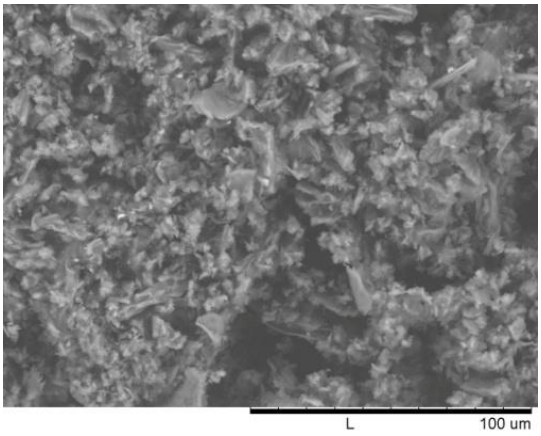
2. Characterizations

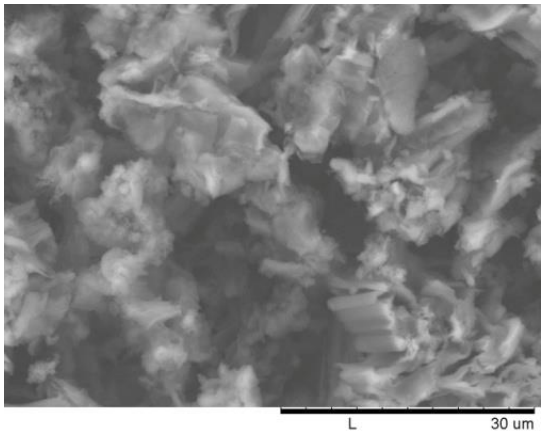
- FTIR Spectroscopy: Attenuated Total Reflectance (ATR)



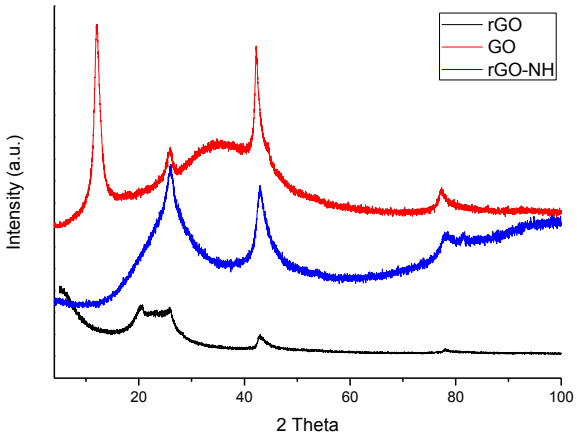
Assignment (cm-1): For rGO-NH 1550 (N–H bending), 1433 (C-N stretching).

- Scanning Electron Microscopy





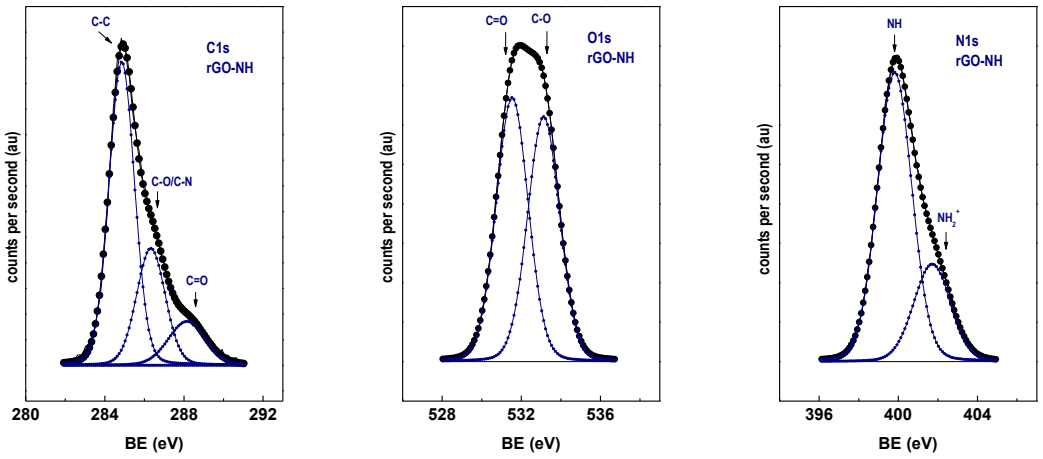
- XRD



XRD pattern of GO, rGO and rGO-NH.

- XPS

	C1s	O1s	N1s	O/C atomic ratio	N/C atomic ratio
GONH	284.8 (57)	531.5 (45)	399.7 (73)	0.202	0.091
	286.3 (31)	532.9 (55)	401.7 (27)		
	288.0 (12)				
rGONH	284.8 (61)	531.5 (52)	399.8 (73)	0.157	0.083
	286.3 (26)	532.9 (48)	401.7 (27)		
	288.1 (13)				
GO	284.8 (38)	531.5 (21)	--	0.655	--
	286.6 (54)	532.7 (79)			
	288.4 (8)				

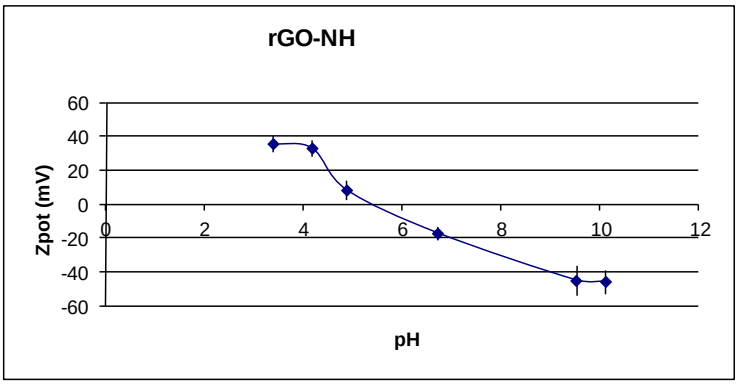


Binding energies (eV) and deconvoluted peaks (%) for C1s, O1s and N1s core levels.

- Elemental analysis

	%C	%H	%N	%S
GO-NH	59.58	3.79	5.33	0.11
rGO-NH	66.58	2.83	5.27	0.05
GO	53.24	2.51	0.04	0.91

- Zeta-potential



Zeta-potential versus pH curve for rGO-NH.

- Amount of NH groups

In order to estimate the amount of NH groups in rGO-NH a reaction with 4-bromobenzyl chloride was performed and the Br amount was quantified by X-ray fluorescence spectroscopy. The value obtained corresponds to 0.13 mmol/g.

- Conductivity

Conductivity of pressed pellets of rGO-NH is 70.75 S/m.

3. Application Fields

Supercapacitors; Catalyst; Solar energy; Graphene semiconductor chips; Conductive graphene film; Graphene computer memory; Biomaterials; Transparent conductive coatings.