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(54) Title: COMPOSITIONS OF GRAPHENE MATERIALS WITH METAL NANOSTRUCTURES AND MICROSTRUCTURES AND METHODS OF MAKING AND USING INCLUDING PRESSURE SENSORS

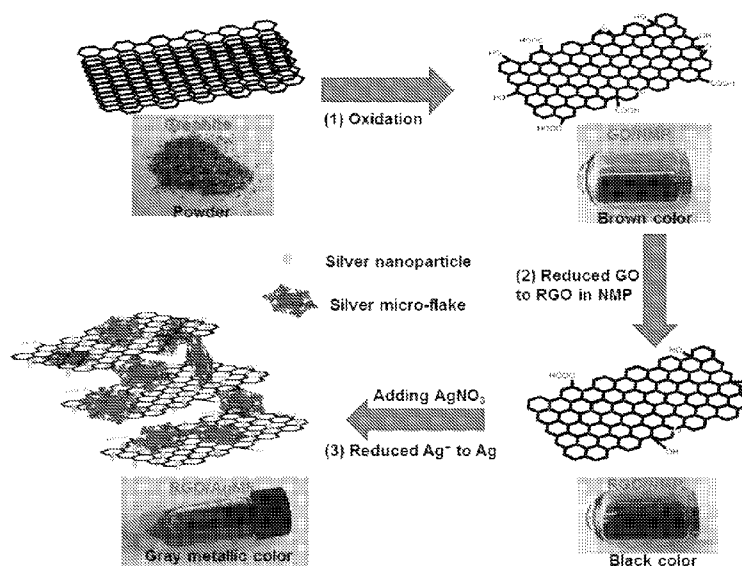


Figure 1

(57) Abstract: Composition comprising at least one graphene material and at least one metal. The metal can be in the form of nanoparticles as well as microflakes, including single crystal microflakes. The metal can be intercalated in the graphene sheets. The composition has high conductivity and flexibility. The composition can be made by a one-pot synthesis in which a graphene material precursor is converted to the graphene material, and the metal precursor is converted to the metal. A reducing solvent or dispersant such as NMP can be used. Devices made from the composition include a pressure sensor which has high sensitivity. Two two- dimension materials can be combined to form a hybrid material.

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INTERNATIONAL SEARCH REPORT

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
C01B

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GAO WEIYIN ET AL: "One-pot synthesis of stabilizer-free Ag-Graphene Nanocomposite and its potential application on photodegradation of RhB", 2013 13TH IEEE INTERNATIONAL CONFERENCE ON NANOTECHNOLOGY (IEEE-NANO 2013), IEEE, 5 August 2013 (2013-08-05), pages 274-279, XP032559679, ISSN: 1944-9399, DOI: 10.1109/NANO.2013.6720825 [retrieved on 2014-01-23] page 274, column 2 "II. EXPERIMENTAL, A. Materials"; page 275 "III. RESULTS AND DISCUSSION"; page 276 page 277, column 2, paragraph 1 ----- -/--	1-20

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	LI QINGZHEN ET AL: "One-pot synthesis of Ag nanoparticles/reduced graphene oxide nanocomposites and their application for nonenzymatic H2O2 detection", ELECTROCHIMICA ACTA, vol. 83, 10 August 2012 (2012-08-10), pages 283-287, XP028945080, ISSN: 0013-4686, DOI: 10.1016/J.ELECTACTA.2012.08.007 page 283, column 2, paragraph 3 page 284, column 1, paragraph 3 - column 2, paragraph 1 page 285, column 1, paragraph 1 -----	1-20
X	PANPAN ZHANG ET AL: "One-pot green synthesis, characterizations, and biosensor application of self-assembled reduced graphene oxide-gold nanoparticle hybrid membranes", JOURNAL OF MATERIALS CHEMISTRY B, vol. 1, no. 47, 17 October 2013 (2013-10-17), page 6525, XP055419168, GB ISSN: 2050-750X, DOI: 10.1039/c3tb21270j page 6526, column 2, paragraph 1 "3.1 Morphology and structure of the produced RGO-AuNP hybrid membrane"; page 6527 -----	1-20
X	YANG LI ET AL: "A facile fabrication of large-scale reduced graphene oxide-silver nanoparticle hybrid film as a highly active surface-enhanced Raman scattering substrate", JOURNAL OF MATERIALS CHEMISTRY C: MATERIALS FOR OPTICAL AND ELECTRONIC DEVICES, vol. 3, no. 16, 13 March 2015 (2015-03-13), pages 4126-4133, XP055419145, UK ISSN: 2050-7526, DOI: 10.1039/C5TC00196J page 4127, column 1, paragraph 1 page 4127, column 2, paragraph 3 page 4128, column 1, paragraph 4 - page 4129, column 1, paragraph 2 -----	1-20
X	US 2014/219906 A1 (KIM STEVEN [KR] ET AL) 7 August 2014 (2014-08-07) figure 2 paragraphs [0048], [0051], [0055], [0056], [0059] example 2 -----	1-13 14-20

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2014219906 A1	07-08-2014	KR 101330230 B1 US 2014219906 A1	18-11-2013 07-08-2014
