Method for obtaining graphene layers and paste comprising graphene nanoplatelets



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Patent information

Technology
readiness
level:
9

Who are we?

Title: "Method for obtaining graphene layers and paste comprising graphene nanoplatelets" Patent number: Pat.222519, EP2570462 Jurisdictions: Germany, France, Great Britain, Poland Priority Date: 19.09.2011

Inventors: Małgorzata Jakubowska, Anna Młożniak, Marcin Słoma

Producing graphene layers on a substrate is based on applying a paste comprising of graphene nanoplatelets mixed with an organic vehicle in the form of a polymethyl methacrylate solution in butyl carbitol acetate or in the form of a polycarbonate solution in butyl carbitol acetate on said substrate by the screen printing method.

Our paste comprises additives which improve dispersion, selected from a group comprising agents which reduce surface tension, facilitate de-agglomeration, prevent re-agglomeration and sedimentation of the filler and additives improving the rheology of the paste. We select substrates from a group comprising: glass, ceramics, metals, plastics, low- and high-temperature polymer films, fabrics, paper.



Microscope photograph of a graphene layer on PET film cured in the temperature of 120°C

Technology Advantages

- because of the low annealing temperature (100°C 400°C), it is suitable for producing graphene layers on surfaces of temperaturesensitive substrates such as aluminium, plastic materials (films), fabrics, paper;
- it is possible to produce pathways/layers with required electric properties, particularly resistive layers or conductive layers;
- our method is relatively quick and inexpensive;
- using the screen printing method as the paste application method offers, on one hand, the possibility to quickly coat large surfaces which is required in case of said applications, such as e.g. optoelectronics, photovoltaics, electrochemical sensors, and high selectivity of coating with graphene (practically, a system of pathways of any complexity can be overprinted);
- screen printing method as an inexpensive and commonly available technique – can be used without excessive expenditures even in small and medium-size enterprises.

Application

The invention can be used in electronics and microelectronics to produce:

- transparent conductive layers which form transparent electrodes in display devices;
- electrodes in lithium-ion batteries;
- electrodes with developed active surface in electrolytic capacitors, including supercapacitors;
- field-effect transistors;
- chemical sensors and biological substances featuring high sensitivity, selectivity and speed of reaction, including gas detectors;
- resistive layers for electronics;
- resistive thermal and electromechanical sensors.



Collaboration type

License agreement or sale agreement

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komercjalizacja@imif.lukasiewicz.gov.pl



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