High Resolution Metrology Of Large Area Graphene Sheets And Methods Of Making And Using Thereof

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OTHER INFORMATION

KEYWORDS

Graphene, Fluorescence Quenching Microscopy, Graphene Quality, Graphene Layers, Semiconductor devices, Photovoltaics, Solar cells, Thermal heat sink, Supercapacitor, Metrology, Graphene measurement

CATEGORIZED AS

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RELATED CASES

2011-876-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,464,990	10/11/2016	2011-876

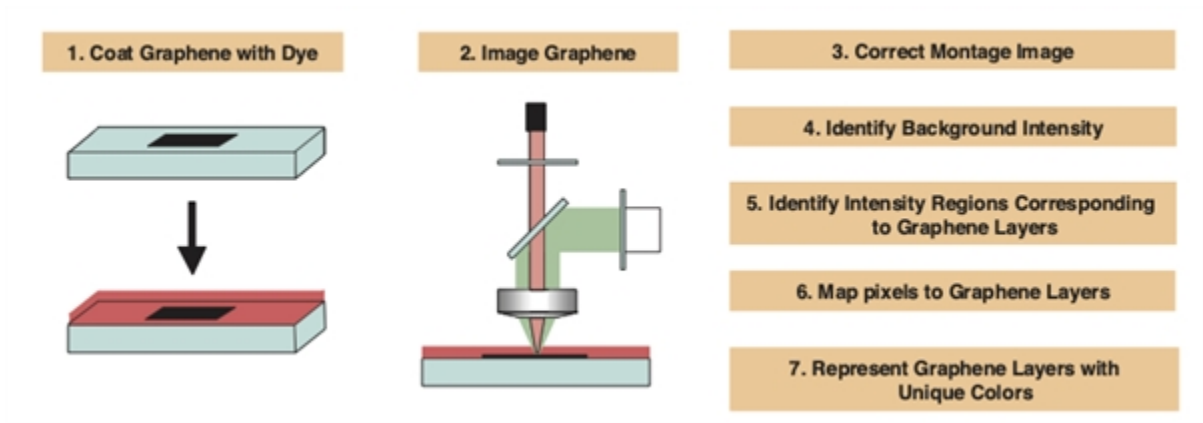
FULL DESCRIPTION

Background

High throughput scaling of the production and characterization of graphene represents a significant requirement to exploit the exceptional electrical, optical and mechanical properties of graphene. Layer thickness and uniformity of the graphene are important parameters that affect the performance and properties of the sample. Raman microscopy, Atomic Force microscopy or color contrast methods are typically used to characterize graphene. Microscopic methods are slow and are limited to smaller regions. Color contrast methods typically require frequent calibration and are dependent on the substrate. Fluorescence Quenching Microscopy (FQM) is a promising method that is fast, substrate independent and equipment is widely available.

Current Invention

Prof. Cengiz Ozkan and his research team at UCR have a patented invention that advances the capabilities of FQM – in identifying and counting large scale graphene layers.



ADVANTAGES

The significance of this discovery is:

- High throughput method for counting and measuring the uniformity of graphene layers.
- Does not require additional calibration.
- Allows for full automation.
- Can be applied to layers in a large area and is substrate agnostic.
- Consistent, repeatable and flexible technique.

SUGGESTED USES

- Energy storage including rechargeable lithium batteries and supercapacitors.
- Photovoltaics or solar cells.
- Semiconductor devices.
- Thermal heat sinks

RELATED MATERIALS

- Centimeter-scale, high-resolution metrology of entire CVD-grown graphene sheets

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