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(54) **DIRECT AND SELECTIVE AREA SYNTHESIS OF GRAPHENE USING MICROHEATER ELEMENTS**

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C01B 32/05	(2017.01)
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See application file for complete search history.

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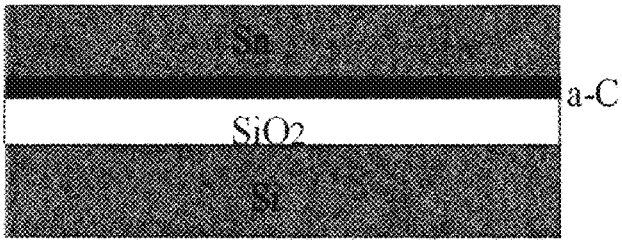
(57) **ABSTRACT**

A method of synthesis of graphene can include: depositing a carbon (C) layer on a substrate, for example a substrate comprising a silicon (Si) layer and an oxide (SiO_2) layer on the Si layer; depositing a metal layer on the C layer; preparing the substrate including the C layer and the metal layer in a chamber; maintaining a pressure of the chamber under 1 atm, for example under 1 Torr; flowing an inert gas in the chamber; contacting a thermal probe tip on the metal layer; heating the thermal probe tip to a temperature of more than 250° C. such that graphene is formed on the substrate; and etching the substrate. The metal layer can be a tin layer.

13 Claims, 7 Drawing Sheets