



(12) **Patent Application Publication**
Parbatani et al.

(43) **Pub. Date:** **Jun. 27, 2024**

Publication Classification

(51) **Int. Cl.**
H01L 23/532 (2006.01)
C23C 16/04 (2006.01)
C23C 16/26 (2006.01)
C23C 16/455 (2006.01)
C23C 16/56 (2006.01)
H01L 21/768 (2006.01)

(52) **U.S. Cl.**
CPC ***H01L 23/53276*** (2013.01); ***C23C 16/04***
(2013.01); ***C23C 16/26*** (2013.01); ***C23C***
16/45525 (2013.01); ***C23C 16/56*** (2013.01);
H01L 21/7685 (2013.01); ***H01L 23/53238***
(2013.01)

(57) **ABSTRACT**

A method for selectively depositing graphene on a metal surface in a back-end-of-line substrate is provided. The method comprises providing the substrate comprising a first dielectric layer and a copper interconnect in the first dielectric layer, the copper interconnect having an exposed metal surface, wherein the exposed metal surface comprises copper, and selectively depositing a carbon layer on the exposed metal surface.

A method for selectively depositing graphene on a metal surface in a back-end-of-line substrate is provided. The method comprises providing the substrate comprising a first dielectric layer and a copper interconnect in the first dielectric layer, the copper interconnect having an exposed metal surface, wherein the exposed metal surface comprises copper, and selectively depositing a carbon layer on the exposed metal surface.

A method for selectively depositing graphene on a metal surface in a back-end-of-line substrate is provided. The method comprises providing the substrate comprising a first dielectric layer and a copper interconnect in the first dielectric layer, the copper interconnect having an exposed metal surface, wherein the exposed metal surface comprises copper, and selectively depositing a carbon layer on the exposed metal surface.

A method for selectively depositing graphene on a metal surface in a back-end-of-line substrate is provided. The method comprises providing the substrate comprising a first dielectric layer and a copper interconnect in the first dielectric layer, the copper interconnect having an exposed metal surface, wherein the exposed metal surface comprises copper, and selectively depositing a carbon layer on the exposed metal surface.

A method for selectively depositing graphene on a metal surface in a back-end-of-line substrate is provided. The method comprises providing the substrate comprising a first dielectric layer and a copper interconnect in the first dielectric layer, the copper interconnect having an exposed metal surface, wherein the exposed metal surface comprises copper, and selectively depositing a carbon layer on the exposed metal surface.

A method for selectively depositing graphene on a metal surface in a back-end-of-line substrate is provided. The method comprises providing the substrate comprising a first dielectric layer and a copper interconnect in the first dielectric layer, the copper interconnect having an exposed metal surface, wherein the exposed metal surface comprises copper, and selectively depositing a carbon layer on the exposed metal surface.

