CLAIMS

1. A semiconductor processing method comprising:

forming a layer of carbon-containing material on a substrate disposed within a processing region of a semiconductor processing chamber, wherein the substrate comprises an exposed region of a first dielectric material and an exposed region of a metal-containing material, wherein the layer of carbon-containing material is selectively formed over the exposed region of the metal-containing material, and wherein forming the layer of carbon-containing material comprises one or more cycles of:

providing a first molecular species that selectively couples with the metal-containing material, and

providing a second molecular species that selectively couples with the first molecular species; and

selectively depositing a second dielectric material on the exposed region of the first dielectric material.

2. The semiconductor processing method of claim 1, wherein the layer of carbon-containing material is formed to a thickness of greater than or about 5 nm.

3. The semiconductor processing method of claim 1, wherein forming the layer of carbon-containing material is performed at a substrate temperature of greater than or about 100 °C.

4. The semiconductor processing method of claim 1, further comprising:

performing an etch of the layer of carbon-containing material to expose the first dielectric material.

5. The semiconductor processing method of claim 1, further comprising:

removing the layer of carbon-containing material by oxidizing the carbon-containing material or annealing the carbon-containing material.

6. The semiconductor processing method of claim 5, wherein the metal-containing material comprises a first metal-containing material, the semiconductor processing method further comprising:

forming a second metal-containing material on the first metal-containing material.

7. The semiconductor processing method of claim 1, wherein the first molecular species is characterized by a head group comprising an amine, diamine, diol, or dithiol.

8. The semiconductor processing method of claim 7, wherein the second molecular species is characterized by a head group comprising oxygen.

9. The semiconductor processing method of claim 1, wherein selectively depositing the second dielectric material comprises a plasma-enhanced deposition.

10. The semiconductor processing method of claim 1, wherein forming the layer of carbon-containing material comprises at least 10 cycles.

11. A semiconductor processing method comprising:

forming a layer of carbon-containing material on a substrate disposed within a processing region of a semiconductor processing chamber, wherein the substrate comprises an exposed region of a dielectric material and an exposed region of a metal-containing material, and wherein the layer of carbon-containing material is selectively formed over the exposed region of the metal-containing material to a thickness of at least twice a thickness formed on the dielectric material; and

selectively depositing a second dielectric material on the exposed region of the dielectric material,

wherein forming the layer of carbon-containing material comprises one or more cycles of:

providing a first molecular species that selectively couples with the metal-containing material, and

providing a second molecular species that selectively couples with the first molecular species.

12. The semiconductor processing method of claim 11, further comprising:

removing the layer of carbon-containing material by oxidizing the carbon-containing material or annealing the carbon-containing material.

13. The semiconductor processing method of claim 11, wherein the layer of carbon-containing material is formed to a thickness of greater than or about 5 nm.

14. The semiconductor processing method of claim 11, wherein the metal-containing material comprises a first metal-containing material, the semiconductor processing method further comprising:

forming a second metal-containing material on the first metal-containing material.

15. The semiconductor processing method of claim 11, wherein forming the layer of carbon-containing material is performed at a substrate temperature of greater than or about 100 °C.

16. The semiconductor processing method of claim 11, further comprising:

performing an etch of the layer of carbon-containing material to expose the dielectric material.

17. A semiconductor processing method comprising:

forming a layer of carbon-containing material on a substrate disposed within a processing region of a semiconductor processing chamber at a substrate temperature of greater than or about 100 °C, wherein the substrate comprises an exposed region of a first dielectric material and an exposed region of a metal-containing material, wherein the layer of carbon-containing material is selectively formed over the exposed region of the metal-containing material, and wherein forming the layer of carbon-containing material comprises one or more cycles of:

providing a first molecular species that selectively couples with the metal-containing material, wherein the first molecular species comprises an amine head group, and

providing a second molecular species that selectively couples with the first molecular species, wherein the second molecular species comprises oxygen; and

selectively depositing a second dielectric material on the exposed region of the first dielectric material.

18. The semiconductor processing method of claim 17, further comprising:

performing an etch of the layer of carbon-containing material to expose the first dielectric material.

19. The semiconductor processing method of claim 17, further comprising:

removing the layer of carbon-containing material by oxidizing the carbon-containing material or annealing the carbon-containing material.