CLAIMS

WHAT IS CLAIMED IS:

1. A device comprising:

a substrate; and

a coating disposed on the substrate,

wherein the coating comprises a multi-metal oxide,

wherein the multi-metal oxide comprises a first species and a second species,

wherein a concentration of at least one of the first species, the second species, or any combination thereof, varies through a thickness of the coating,

wherein the first species comprises yttrium and the second species comprises aluminum,

wherein the multi-metal oxide comprises an yttrium aluminum oxide, an yttrium aluminum oxyfluoride, or any combination thereof, and

wherein a ratio (Y/(Y+Al)) of yttrium to a sum of yttrium and aluminum varies through the thickness of the coating.

2. The device of claim 1, wherein the concentration of the first species and the second species varies through the thickness of the coating.

3. The device of claim 1, wherein a ratio (X/(X+Y)) of the first species X, to a sum of the first species and the second species (X+Y), is 0.3 to 0.85.

4. The device of claim 1, wherein the coating has a thickness of 1 μm to 25 μm.

5. The device of claim 1, wherein the coating further comprises:

a third species,

wherein a concentration of the third species varies through the thickness of the coating.

6. The device of claim 5, wherein the third species comprises a fluorine.

7. The device of claim 1, wherein the multi-metal oxide comprises an amorphous multi-metal oxide.

8. The device of claim 1, further comprising:

at least one layer comprising a metal oxide,

wherein the at least one layer is located between the substrate and the coating, or the coating is located between the substrate and the at least one layer,

wherein the at least one layer is different from the coating.

9. The device of claim 8, wherein the at least one layer comprises:

a first layer comprising alumina; and

a second layer comprising yttria,

wherein the first layer is located between the substrate and the coating,

wherein the second layer is located between the first layer and the coating.

10. The device of claim 1, where in the device is a component used in a semiconductor manufacturing process.

11. A method comprising:

sputtering a first metal species from a first target;

sputtering a second metal species from a second target; and

depositing at least one of the first metal species, the second metal species, or any combination thereof, to form a multi-metal oxide film on a substrate,

wherein a ratio of the first metal species, to a sum of the first metal species and the second metal species, is 0.3 to 0.85,

wherein the first target comprises yttrium and the second target comprises aluminum,

wherein the sputtering of the first metal species and the sputtering of the second metal species are performed in a presence of an oxygen component, and

wherein a power applied to at least one of the first target and the second target is varied to vary the ratio of yttrium to the sum of yttrium and aluminum in the multi-metal oxide film, and

wherein the multi-metal oxide film comprises yttrium aluminum oxide.

12. The method of claim 11, wherein the ratio of the first metal species, to the sum of the first metal species and the second metal species, varies through a thickness of the multi-metal oxide film.

13. The method of claim 11, further comprising applying a power to the first target and to the second target using a single power supply.

14. The method of claim 11, further comprising:

contacting the multi-metal oxide film with a reactive gas comprising a fluorine component sufficient to fluorinate at least a portion of the multi-metal oxide film.

15. The method of claim 11, wherein the substrate is a component of an etch chamber.