CLAIMS

[Claim 1]

A method for depositing a metal oxide, comprising:

a first step of introducing a first precursor into a first chamber and introducing an oxidizer in a plasma state into the first chamber;

a second step of introducing a second precursor into the first chamber and introducing the oxidizer in the plasma state into the first chamber;

a third step of introducing a third precursor into the first chamber and introducing the oxidizer in the plasma state into the first chamber; and

a fourth step of performing microwave treatment,

wherein performing each of the first to third steps one or more times is regarded as one cycle,

wherein the metal oxide is formed after the one cycle is repeated a plurality of times in the first chamber,

wherein the fourth step is performed on the metal oxide in a second chamber,

wherein the first to third precursors are different kinds of precursors,

wherein the microwave treatment is performed using an oxygen gas and an argon gas,

wherein the metal oxide comprises a crystal region, and

wherein a c-axis of the crystal region is substantially parallel to a normal vector of a surface where the metal oxide is formed or a normal vector of a surface of the metal oxide.

[Claim 2]

A method for depositing a metal oxide, comprising:

a first step of introducing a first precursor into a first chamber and introducing an oxidizer into the first chamber;

a second step of introducing a second precursor into the first chamber and introducing the oxidizer into the first chamber;

a third step of introducing a third precursor into the first chamber and introducing the oxidizer into the first chamber; and

a fourth step of performing microwave treatment,

wherein performing each of the first to third steps one or more times is regarded as one cycle,

wherein the metal oxide is formed after the one cycle is repeated a plurality of times in the first chamber,

wherein the fourth step is performed on the metal oxide in a second chamber,

wherein the first to third precursors are different kinds of precursors,

wherein the microwave treatment is performed using an oxygen gas and an argon gas,

wherein the metal oxide comprises a crystal region, and

wherein a c-axis of the crystal region is substantially parallel to a normal vector of a surface where the metal oxide is formed or a normal vector of a surface of the metal oxide.

[Claim 3]

A method for depositing a metal oxide, comprising:

a first step of introducing a first precursor into a chamber and introducing an oxidizer in a plasma state into the chamber;

a second step of introducing a second precursor into the chamber and introducing the oxidizer in the plasma state into the chamber;

a third step of introducing a third precursor into the chamber and introducing the oxidizer in the plasma state into the chamber; and

a fourth step of performing microwave treatment,

wherein performing each of the first to third steps one or more times is regarded as one cycle,

wherein the metal oxide is formed after the one cycle is repeated a plurality of times in the chamber,

wherein the fourth step is performed on the metal oxide in the chamber,

wherein the first to third precursors are different kinds of precursors,

wherein the metal oxide comprises a crystal region, and

wherein a c-axis of the crystal region is substantially parallel to a normal vector of a surface where the metal oxide is formed or a normal vector of a surface of the metal oxide.

[Claim 4]

The method for depositing a metal oxide, according to any one of claim 1 to claim 3,

wherein the one cycle is further repeated a plurality of times after the fourth step.

[Claim 5]

The method for depositing a metal oxide, according to any one of claim 1 to claim 4,

wherein the first precursor comprises indium,

wherein the second precursor comprises an element *M* that is any one or more of gallium, aluminum, and yttrium,

wherein the third precursor comprises zinc, and

wherein the oxidizer comprises one or more selected from ozone, oxygen, and water.