WHAT IS CLAIMED IS:

1. A method of manufacturing a semiconductor device, comprising:

(a) forming a first metal film by supplying a plurality of times a first metal-containing gas and a first reducing gas, which is a simple substance composed of a hydrogen element, without being mixed with each other to a substrate having a concave portion in a surface of the substrate; and

(b) forming a second metal film on the first metal film by supplying a plurality of times at least a second metal-containing gas and a second reducing gas different from the first reducing gas without being mixed with each other to the substrate,

wherein the acts of (a) and (b) are performed in this order.

2. The method of Claim 1, further comprising (c) etching at least the second metal film by supplying an etching gas to the substrate.

3. The method of any one of Claims 1 or 2, wherein the first metal-containing gas and the second metal-containing gas are halogen-based compounds, and the second reducing gas is a compound containing a hydrogen element.

4. The method of Claim 3, wherein the second reducing gas is a compound in which a binding energy between elements, which constitute the second reducing gas, is smaller than a binding energy between hydrogen elements.

5. The method of Claim 2, wherein the first metal film and the second metal film have a same etching rate with respect to the etching gas.

6. The method of any one of Claims 1 to 5, wherein the second metal film has a smaller stress value than the first metal film.

7. The method of any one of Claims 2 to 6, wherein in (a), a thickness of the first metal film is 1.1 times or more and 1.2 times or less of a thickness of the first metal film remaining after performing (c).

8. The method of any one of Claims 1 to 7, wherein metal elements contained in the first metal-containing gas and the second metal-containing gas are a same element.

9. The method of Claim 8, wherein the metal elements are any one of tungsten, molybdenum, copper, and cobalt.

10. The method of any one of Claims 1 to 4, wherein metal elements contained in the first metal-containing gas and the second metal-containing gas are different elements.

11. A method of processing a substrate, comprising:

(a) forming a first metal film by supplying a plurality of times a first metal-containing gas and a first reducing gas, which is a simple substance composed of a hydrogen element, without being mixed with each other to a substrate having a concave portion in a surface of the substrate; and

(b) forming a second metal film on the first metal film by supplying a plurality of times at least a second metal-containing gas and a second reducing gas different from the first reducing gas without being mixed with each other to the substrate,

wherein the acts of (a) and (b) are performed in this order.

12. The method of Claim 11, further comprising (c) etching at least the second metal film by supplying an etching gas to the substrate.

13. A substrate processing apparatus, comprising:

a process chamber in which a substrate is processed;

a gas supply system configured to supply a first metal-containing gas, a second metal-containing gas, a first reducing gas that is a simple substance composed of a hydrogen element, a second reducing gas different from the first reducing gas, and an etching gas to the substrate in the process chamber; and

a controller configured to be capable of controlling the gas supply system so as to perform, in the process chamber, in the following order:

(a) forming a first metal film by supplying a plurality of times the first metal-containing gas and the first reducing gas without being mixed with each other to the substrate having a concave portion on a surface of the substrate; and

(b) forming a second metal film on the first metal film by supplying a plurality of times at least the second metal-containing gas and the second reducing gas without being mixed with each other to the substrate.

14. The substrate processing apparatus of Claim 13,

wherein the controller is configured to further perform (c) etching at least the second metal film by supplying the etching gas to the substrate.

15. A program that causes, by a computer, a substrate processing apparatus to perform a process in a process chamber of the substrate processing apparatus, the process comprising performing in the following order:

(a) forming a first metal film by supplying a plurality of times a first metal-containing gas and a first reducing gas, which is a simple substance composed of a hydrogen element, without being mixed with each other to a substrate having a concave portion on a surface of the substrate; and

(b) forming a second metal film on the first metal film by supplying a plurality of

times at least a second metal-containing gas and a second reducing gas different from the first reducing gas without being mixed with each other to the substrate.

16. The program of Claim 15, wherein the process further comprises (c) etching at least the second metal film by supplying an etching gas to the substrate.