Claims

1. A sputtering target comprising:

aluminum; and

~~either~~ a rare earth element~~ or a titanium group element, or both a rare earth element and a titanium group element~~,

the sputtering target having a fluorine content of 100 ppm or less,

wherein the sputtering target having the rare earth elements content of 10 to 75 atomic%,

wherein the rare earth element is scandium.

2. The sputtering target according to claim 1, wherein the sputtering target having a chlorine content of 100 ppm or less.

3. The sputtering target according to claim 1 or 2, wherein the sputtering target having an oxygen content of 500 ppm or less.

4. The sputtering target according to any one of claims 1 to 3, wherein an intermetallic compound including ~~at least two elements selected from~~ the aluminum~~,~~ and ~~a~~the rare earth element~~, or a titanium group element~~ is present in the sputtering target.

5. The sputtering target according to claim 4, wherein

the intermetallic compound comprises one, two, three, or four kinds of intermetallic compounds being present in the sputtering target.

6. The sputtering target according to any one of claims 1 to 5, wherein at least one nitride of at least one element selected from the aluminum~~,~~ and ~~a~~ the rare earth element~~, or a titanium group element~~ is present in the sputtering target.

~~7. The sputtering target according to any one of claims 1 to 6, wherein the rare earth element is at least one of scandium or yttrium.~~

~~8. The sputtering target according to any one of claims 1 to 7, wherein the titanium group element is at least one of titanium, zirconium, or hafnium.~~

~~9~~7. The sputtering target according to any one of claims 1 to ~~8~~6, wherein the sputtering target having

a structure in which ~~at least one of~~ a material containing the aluminum and ~~a~~the rare earth element~~, a material containing aluminum and a titanium group element, or a material containing aluminum, a rare earth element, and a titanium group element~~ is present in an aluminum matrix, or

a structure including at least a composite phase

including ~~either~~ a phase consisting of ~~a~~the rare earth element and an inevitable impurity as metal species~~ or a phase consisting of a titanium group element and an inevitable impurity as metal species or both a phase consisting of a rare earth element and an inevitable impurity as metal species and a phase consisting of a titanium group element and an inevitable impurity as metal species~~ in an aluminum matrix.