Claims

1. A sputtering target comprising:

aluminum; and

a rare earth element,

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

wherein the sputtering target has the rare earth elements content of 10 atomic% or more, wherein the sputtering target has a structure in which an aluminum matrix phase is present,

wherein the rare earth element is scandium,

wherein the sputtering target is a sintered body of a powder compact, and

wherein the sputtering target has a structure in which an aluminum-rare earth element alloy is present in the aluminum matrix phase,

the structure in which a plurality of aluminum-rare earth element alloy particles are attached to each other via the aluminum matrix phase,

each of the aluminum-rare earth element alloy particles is an aggregate of aluminum-rare earth element alloy crystal grains,

a boundary between an aluminum-rare earth element alloy crystal grain and an adjacent aluminum-rare earth element alloy crystal grain is a grain boundary,

the aluminum matrix phase is an aggregate of aluminum crystal grains, and

a boundary between an aluminum crystal grain and an adjacent aluminum crystal grain is a grain boundary.

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 the aluminum and the rare earth element is present in the sputtering target.

5. The sputtering target according to claim 4, wherein the intermetallic compound includes one, two, three, or four kinds of intermetallic compounds 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 the rare earth element is present in the sputtering target.