DESCRIPTION

TITLE OF INVENTION: METALLIC SPUTTERING TARGET, PRODUCTION METHOD THEREFOR, AND METALLIC MATERIAL AND PRODUCTION METHOD THEREFOR

TECHNICAL FIELD

[0001]

The present disclosure relates to a metal material suitable as a sputtering target and a method for producing the metal material, and a metal sputtering target comprising the metal material and a method for producing the metal sputtering target.

BACKGROUND ART

[0002]

Metals having body-centered cubic structures, such as chromium and molybdenum, are used for light-shielding films for lithography masks and as film-forming materials for obtaining such films, such as sputtering targets. When a metal having a body-centered cubic structure is used as a sputtering target, sputtered particles deposit in the {111} plane direction, which is the closest-packed plane direction. Thus, if the ratio of the {111} plane is high, a sputtered film can be formed with higher efficiency by using a metal having a body-centered cubic structure as a sputtering target.

For example, it has been studied that a metal having a body-centered cubic structure is oriented in the {111} plane through repeated forging and rolling treatments (Patent Document 1).

PRIOR ART DOCUMENTS

PATENT DOCUMENTS

[0003]

Patent Document 1: International Publication No. 2020/195121

SUMMARY

[0003a]

In an aspect of the present disclosure, there is provided a metal material comprising a metal having a body-centered cubic structure, wherein with respect to a sum of orientation area fractions of a {001} plane, a {101} plane and a {111} plane, a ratio of the orientation area fraction of the {111} plane is 0.45 or more.

[0003b]

In another aspect of the present disclosure, there is provided a method for producing the metal material as disclosed herein, the method comprising a pressurization step of performing a pressurization treatment on an ingot formed of a metal having a body-centered cubic structure at a pressurizing temperature of 500°C or higher and a pressurizing rate of less than 15 mm/s to obtain a processed ingot, and a heat treatment step of treating the processed ingot at 850°C or higher.

[0003c]

In a further aspect of the present disclosure, there is provided a sputtering target comprising the metal material as disclosed herein.

[0003d]

In another aspect of the present disclosure, there is provided a method for producing a film, the method comprising using a sputtering target comprising the metal material as disclosed herein.

DISCLOSURE OF INVENTION

TECHNICAL PROBLEM