metal elements other than zirconium and hafnium and lanthanoid rare earth elements.

SUMMARY

[0009a]

In an aspect of the present disclosure, there is provided a method for producing a stabilizing element-containing zirconia sintered body, the method comprising: a first heating step of heating a zirconia compositional substance containing a stabilizing element from a heating start temperature to a first target temperature of 800°C or higher and 1150 °C or lower at a heating rate of 150°C/minute or more, wherein a content of the stabilizing element is 2.5 mol% or more and 5.2 mol% or less, and the zirconia compositional substance is constituting of at least one of cubic phase and tetragonal phase as the main phase and has a T + C phase ratio of 65% or more; a second heating step of elevating the temperature from the first target temperature to a second target temperature of 1400°C or higher and lower than 1580°C at a heating rate of more than 30°C/minute and less than 200°C/minute; and a retaining step of retaining the second target temperature.

ADVANTAGEOUS EFFECTS OF INVENTION

[0010]

The present disclosure achieves the object of providing a method for producing a sintered body by short-time sintering, by which a sintered body satisfying a light transmitting property required of dental prostheses is obtained without requiring precision temperature control in the high-temperature range and irrespective of the stabilizing element content in the zirconia compositional substance.

DESCRIPTION OF EMBODIMENTS

[0011]

A method for producing a sintered body according to the present disclosure will now be described through one example embodiment. The terms used in the embodiments are as follows. Each of the features and parameters disclosed in this description may be combined in any desired manner, and upper limits and lower limits of values disclosed in this description may be combined in any desired manner.

CLAIMS

Claim 1. A method for producing a stabilizing element-containing zirconia sintered body, the method comprising: a first heating step of heating a zirconia compositional substance containing a stabilizing element from a heating start temperature to a first target temperature of 800°C or higher and 1150 °C or lower at a heating rate of 150°C/minute or more, wherein a content of the stabilizing element is 2.5 mol% or more and 5.2 mol% or less, and the zirconia compositional substance is constituting of at least one of cubic phase and tetragonal phase as the main phase and has a T + C phase ratio of 65% or more; a second heating step of elevating the temperature from the first target temperature to a second target temperature of 1400°C or higher and lower than 1580°C at a heating rate of more than 30°C/minute and less than 200°C/minute; and a retaining step of retaining the second target temperature.

Claim 2. The production method according to claim 1, wherein a retention time in the retaining step is less than 20 minutes.

Claim 3. The production method according to claim 1 or 2, wherein a difference between the second target temperature and the first target temperature is 300°C or more and 600°C or less.

Claim 4. The production method according to claim 1 or 2, wherein the heating rate up to the second target temperature relative to the heating rate up to the first target temperature is 0.15 or more and 1.0 or less.

Claim 5. The production method according to claim 1 or 2, wherein the heating start temperature is a temperature ranging from room temperature to 500°C.

Claim 6. The production method according to claim 1 or 2, further comprising a cooling step of decreasing the temperature from the second target temperature to a cooling temperature of 800°C or higher and 1200°C or lower and discharging a sintered body from a sintering furnace.

Claim 7. The production method according to claim 6, wherein the discharged sintered body is cooled in an air atmosphere by at least one of natural cooling and blowing of a cooling gas.

Claim 8. The production method according to claim 7, wherein the cooling gas is at

least one selected from the group consisting of air, argon, nitrogen and helium.

Claim 9. The production method according to claim 1 or 2, wherein a sintering furnace equipped with a heater containing at least one selected from the group consisting of molybdenum disilicide, silicon carbide, lanthanum chromite and carbon is used in sintering.

Claim 10. The production method according to claim 1 or 2, wherein the compositional substance is a green body or calcined body of zirconia.

Claim 11. The production method according to claim 1 or 2, wherein the stabilizing element is at least one selected from the group consisting of yttrium, calcium, cerium, magnesium, praseodymium, ytterbium, erbium and terbium.

Claim 12. The production method according to claim 1 or 2, wherein a content of the stabilizing element is 3.5 mol% or more and 5.0 mol% or less.

Claim 13. The production method according to claim 1 or 2, wherein the compositional substance has a T + C phase ratio of 100% or less.

Claim 14. The production method according to claim 1 or 2, wherein the compositional substance contains at least one selected from the group consisting of iron (Fe), cobalt (Co), manganese (Mn), nickel (Ni), copper (Cu), titanium (Ti), chromium (Cr), praseodymium (Pr), neodymium (Nd), erbium (Er), terbium (Tb) and ytterbium (Yb).