Patent Literature 1: JP-A-2014-94864

Patent Literature 2: JP-A-2013-1628

Patent Literature 3: JP-A-2020-73440

Patent Literature 4: JP-A-2003-146676

The entire description of Patent Literatures 1 to 4 is expressly incorporated herein by reference.

SUMMARY

[0009a]

In a first aspect of the present disclosure, there is provided a black quartz glass comprising Si of 0.5 to 10 mass%, SiO of 0.1 to 5 mass% and SiO_2 of the residue (hereinafter referred to as quartz glass), wherein the SCE reflectance at a wavelength of 350 nm to 750 nm is 10% or less.

[0009b]

In another aspect of the present disclosure, there is provided a method for producing black quartz glass, comprising:

(1) pressure-molding a powder obtained by mixing and consolidating fumed silica with a Si powder of 0.5 to 10 mass% and a SiO powder of 0.1 to 5 mass%, and heating the pressure-molded product in the atmosphere at a maximum temperature of 1200 to 1300°C and sintering the fumed silica to obtain the black quartz glass as disclosed herein; or

(2) pressure-molding a powder obtained by mixing and consolidating fumed silica of 30 to 60 mass% and a synthetic silica powder of the residue having D_{50} of 60 to 100 μm, D_{10} of 40 μm or more and D_{95} of 180 μm or less in the particle diameter, with a

Si powder of 0.5 to 10 mass% and a SiO powder of 0.1 to 5 mass%, and heating and sintering the pressure-molded product in the atmosphere at a maximum temperature of 1250 to 1320°C to obtain the black quartz glass as disclosed herein; or

(3) pressure-molding a powder obtained by mixing and consolidating fumed silica of 30 to 60 mass%, spherical silica of 5 to 25 mass% having D_{50} of 5 to 15 μm, D_{10} of 1 μm or more and D_{95} of 70 μm or less, and a synthetic silica powder of the residue having D_{50} of 60 to 100 μm, D_{10} of 40 μm or more and D_{95} of 180 μm or less in the particle diameter, with a Si powder of 0.5 to 10 mass% and a SiO powder of 0.1 to 5 mass%, and heating and sintering the pressure-molded product in the atmosphere at a maximum temperature of 1250 to 1320°C to obtain the black quartz glass as disclosed herein.

[0009c]

In yet another aspect of the present disclosure, there is provided a product comprising a black quartz glass member made of the black quartz glass as disclosed herein.

TECHNICAL PROBLEM

[0010]

However, in the black quartz glass described in Patent Literature 1, a color uniformity is not sufficient when the size is enlarged, a temperature of 1800°C or more is required for producing, furnace materials and heaters need to be made of high-grade materials, and simultaneously a great deal of energy is required for heating, resulting in a productivity problem. In addition, it is difficult to apply it to the semiconductor manufacturing field since the niobium compound contained therein may cause contamination in a step of using it.

[0011]

The black quartz glass described in Patent Literature 2 also has the problem in color uniformity, and it is difficult to enlarge the size. In producing, there is also a problem in productivity due to a complicated structure of furnace and a cumbersome operation for a need for non-oxidizing atmosphere. It is also difficult to enlarge the size in terms of the structure of furnace. In addition, it is difficult to apply it to the semiconductor manufacturing field since carbon contained therein may be generated as particles in a step