[0003] PTL 1: Japanese Unexamined Patent Publication (KOKAI) No. 2010-64921

Summary

[0003a] In one aspect of the present disclosure, there is provided a glass for magnetic recording medium substrate,

which is an amorphous oxide glass,

wherein, in terms of mol%:

an SiO_2 content ranges from 45 to 68%;

an Al_2O_3 content ranges from 5 to 20%;

a total content of SiO_2 and Al_2O_3 ($SiO_2 + Al_2O_3$) ranges from 60 to 80%;

a B_2O_3 content ranges from 0 to 5%;

an MgO content ranges from 3 to 28%;

a CaO content ranges from 0 to 18%;

a total content of BaO and SrO (BaO + SrO) ranges from 0 to 2%;

a total content of alkali earth metal oxides (MgO + CaO + SrO + BaO) ranges from 12 to 30%;

a total content of alkali metal oxides ($Li_2O + Na_2O + K_2O$) ranges from 3.5 to 15%; and

at least one kind selected from the group consisting of Sn oxide and Ce oxide being included, a total content of Sn oxide and Ce oxide ranges from 0.05 to 2.00%,

a glass transition temperature is equal to or higher than 625°C;

a Young's modulus is equal to or more than 83 GPa;

a specific gravity is equal to or less than 2.85; and

an average linear expansion coefficient at 100 to 300°C is equal to or more than 48×10^{-7}/°C.

[0003b] In another aspect of the present disclosure, there is provided a magnetic recording medium substrate, which is comprised of the glass for magnetic recording medium substrate as disclosed herein.

[0003c] In a further aspect of the present disclosure, there is provided a magnetic recording medium, which comprises a magnetic recording layer on the magnetic recording medium substrate as disclosed herein.

[0003d] In a further aspect of the present disclosure, there is also provided a glass spacer for magnetic recording and reproducing apparatus,

which is an amorphous oxide glass,

wherein, in terms of mol%:

an SiO_2 content ranges from 45 to 68%;

an Al_2O_3 content ranges from 5 to 20%;

a total content of SiO_2 and Al_2O_3 ($SiO_2 + Al_2O_3$) ranges from 60 to 80%;

a B_2O_3 content ranges from 0 to 5%;

an MgO content ranges from 3 to 28%;

a CaO content ranges from 0 to 18%;

a total content of BaO and SrO (BaO + SrO) ranges from 0 to 2%;

a total content of alkali earth metal oxides (MgO + CaO + SrO + BaO) ranges from 12 to 30%;

a total content of alkali metal oxides (Li_2O + Na_2O + K_2O) ranges from 3.5 to 15%; and

at least one kind selected from the group consisting of Sn oxide and Ce oxide being included, a total content of Sn oxide and Ce oxide ranges from 0.05 to 2.00%,

a glass transition temperature is equal to or higher than 625°C;

a Young's modulus is equal to or more than 83 GPa;

a specific gravity is equal to or less than 2.85; and

an average linear expansion coefficient at 100 to 300°C is equal to or more than 48×10^{-7}/°C.

Technical Problem

[0004] In a process of forming a magnetic recording layer on a magnetic recording medium substrate, film formation at a high temperature is usually performed or a heat treatment at a high temperature is performed after film formation. Accordingly, a glass for magnetic

recording medium substrate is required to have high heat resistance capable of withstanding a high temperature treatment, specifically to have a high glass transition temperature.

[0005] On the other hand, a magnetic recording and reproducing apparatus incorporated with a magnetic recording medium (generally referred to as a HDD (hard disk drive)) has a structure in which the center portion is pressed down with a spindle of a spindle motor and a clamp and the magnetic recording medium itself is rotated. As a consequence, when there is a large difference between respective thermal expansion coefficients of a magnetic recording medium substrate and a spindle material constituting the spindle portion, deviation occurs during use between thermal expansion/ thermal contraction of the spindle and thermal expansion/ thermal contraction of the magnetic recording medium substrate relative to ambient temperature change. As a result, a phenomenon such as deformation of the magnetic recording medium is generated. When the phenomenon is generated, a head cannot read written information to cause deterioration of reliability on recording/ reproduction.