

ABSTRACT

Glass substrate for magnetic recording medium, magnetic recording medium, and glass substrate blank for magnetic recording medium

The present invention relates to a glass substrate for a magnetic recording medium, which is comprised of glass comprising, denoted as molar percentages, 56 to 75 percent of SiO_2 , 1 to 11 percent of Al_2O_3 , more than 0 percent but equal to or less than 4 percent of Li_2O , equal to or more than 1 percent but less than 15 percent of Na_2O , equal to or more than 0 percent but less than 3 percent of K_2O , and substantially no BaO , with a total content of Li_2O , Na_2O , and K_2O falling within a range of 6 to 15 percent, with a molar ratio $(\text{Li}_2\text{O}/\text{Na}_2\text{O})$ being less than 0.50, with a molar ratio $\{\text{K}_2\text{O}/(\text{Li}_2\text{O} + \text{Na}_2\text{O} + \text{K}_2\text{O})\}$ being equal to or less than 0.13, with a total content of MgO , CaO , and SrO falling within a range of 10 to 30 percent, with a total content of MgO and CaO falling within a range of 10 to 30 percent, with a molar ratio $\{(\text{MgO} + \text{CaO})/(\text{MgO} + \text{CaO} + \text{SrO})\}$ being equal to or more than 0.86, with a total content of the above alkali metal oxides and alkaline earth metal oxides falling within a range of 20 to 40 percent, with a molar ratio $\{(\text{MgO} + \text{CaO} + \text{Li}_2\text{O})/(\text{Li}_2\text{O} + \text{Na}_2\text{O} + \text{K}_2\text{O} + \text{MgO} + \text{CaO} + \text{SrO})\}$ being equal to or more than 0.50, with a total content of ZrO_2 , TiO_2 , Y_2O_3 , La_2O_3 , Gd_2O_3 , Nb_2O_5 , and Ta_2O_5 being more than 0 percent but equal to or less than 10 percent, and with a molar ratio $\{(\text{ZrO}_2 + \text{TiO}_2 + \text{Y}_2\text{O}_3 + \text{La}_2\text{O}_3 + \text{Gd}_2\text{O}_3 + \text{Nb}_2\text{O}_5 + \text{Ta}_2\text{O}_5)/\text{Al}_2\text{O}_3\}$ being equal to or more than 0.40, as well as having a glass transition temperature of equal to or higher than 600°C , an average coefficient of linear expansion of equal to or higher than $70 \times 10^{-7}/^\circ\text{C}$ at 100 to 300°C , and a Young's modulus of equal to or higher than 80 GPa.

Figure 1