CLAIMS

1. A method for manufacturing a glass substrate for a magnetic disk, comprising a grinding step of grinding a main surface of a glass substrate using a lubricant and a surface plate that has a grinding surface provided with a fixed abrasive grain containing diamond particles,

Al^{3+} being contained in the lubricant that is supplied to the surface on which grinding processing is performed of the glass substrate.

2. The method for manufacturing a glass substrate for a magnetic disk according to claim 1, wherein Al_2O_3 is added to the lubricant.

3. The method for manufacturing a glass substrate for a magnetic disk according to claim 1 or 2, wherein the lubricant has an Al^{3+} content in a range of 0.05 g/L to 1.0 g/L.

4. The method for manufacturing a glass substrate for a magnetic disk according to any of claims 1 to 3, wherein the glass substrate contains:

SiO_2 in an amount of 50 to 75 mol%,

Al_2O_3 in an amount of 0 to 5 mol%,

BaO in an amount of 0 to 2 mol%,

Li_2O in an amount of 0 to 3 mol%,

ZnO in an amount of 0 to 5 mol%,

Na_2O and K_2O in a total amount of 3 to 15 mol%,

MgO, CaO, SrO, and BaO in a total amount of 14 to 35 mol%, and

ZrO_2, TiO_2, La_2O_3, Y_2O_3, Yb_2O_3, Ta_2O_5, Nb_2O_5, and HfO_2 in a total amount of 2 to 9 mol%, and

has a molar ratio [(MgO+CaO)/(MgO+CaO+SrO+BaO)] in a range of 0.85 to 1 and a molar ratio [Al_2O_3/(MgO+CaO)] in a range of 0 to 0.30.

5. A method for manufacturing a magnetic disk, comprising forming at least a magnetic layer on a magnetic disk glass substrate obtained by the manufacturing

method of any of claims 1 to 4.

6. A method for manufacturing a glass substrate for a magnetic disk, comprising a grinding step of grinding a main surface of a glass substrate using a lubricant and a surface plate that has a grinding surface provided with a plurality of fixed abrasive grains,

an additive to facilitate discharge of an aggregate of sludge accumulated on the grinding surface due to grinding being contained in the lubricant that is supplied to the surface on which grinding processing is performed of the glass substrate.

7. The method for manufacturing a glass substrate for a magnetic disk according to claim 6, wherein the glass substrate is composed of glass containing SiO_2 as a main component and Al_2O_3 in an amount of 0 to 15 wt%.

8. The method for manufacturing a glass substrate for a magnetic disk according to claim 6 or 7, wherein the lubricant is composed of an aqueous solution containing one or more selected from the group consisting of amine, mineral oil, kerosene, mineral spirit, water soluble oil emulsion, polyethylene imine, ethylene glycol, monoethanolamine, diethanolamine, triethanolamine, propylene glycol, amine borate, boric acid, amine carboxylate, pine oil, indole, thioamine salt, amide, hexahydro-1,3,5-triethyltriazine, carboxylic acid, sodium 2-mercaptobenzothiazole, isopropanolamine, triethylenediamine tetraacetate, propylene glycol methyl ether, benzotriazol, sodium 2-pyridinethiol-1-oxide, and hexylene glycol.

9. The method for manufacturing a glass substrate for a magnetic disk according to any of claims 6 to 8, wherein the additive added to the lubricant is selected from Al_2O_3, aluminum ammonium sulfate, aluminum bromide, aluminum chloride, aluminum hydroxide, aluminum iodide, aluminum nitrate, aluminum phosphate, aluminum potassium sulfate, and aluminum sulfate.

10. The method for manufacturing a glass substrate for a magnetic disk according to any of claims 6 to 9, wherein a content of the additive added to the lubricant is in a

range of 0.05 g/L to 1.0 g/L.

CLAIMS

1. A method for manufacturing a glass substrate for a magnetic disk, comprising a grinding step of grinding a main surface of a glass substrate using a lubricant and a surface plate that has a grinding surface provided with a plurality of fixed abrasive grains, wherein

the lubricant is supplied to the surface of the glass substrate on which the grinding step is performed, and the lubricant includes an additive comprising aluminum ions to facilitate discharge of an aggregate of sludge accumulated on the grinding surface due to the grinding step .

2. The method for manufacturing a glass substrate for a magnetic disk according to claim 1, wherein the glass substrate is composed of glass containing SiO_2 as a main component and Al_2O_3.

3. The method for manufacturing a glass substrate for a magnetic disk according to claim 1 or 2, wherein the lubricant is composed of an aqueous solution containing one or more selected from the group consisting of amine, mineral oil, kerosene, mineral spirit, water soluble oil emulsion, polyethylene imine, ethylene glycol, monoethanolamine, diethanolamine, triethanolamine, propylene glycol, amine borate, boric acid, amine carboxylate, pine oil, indole, thioamine salt, amide, hexahydro-1,3,5-triethyltriazine, carboxylic acid, sodium 2-mercaptobenzothiazole, isopropanolamine, triethylenediamine tetraacetate, propylene glycol methyl ether, benzotriazol, sodium 2-pyridinethiol-1-oxide, and hexylene glycol.

4. The method for manufacturing a glass substrate for a magnetic disk according to any one of claims 1 to 3, wherein the additive added to the lubricant is selected from Al_2O_3, aluminum ammonium sulfate, aluminum bromide, aluminum chloride, aluminum hydroxide, aluminum iodide, aluminum nitrate, aluminum phosphate, aluminum potassium sulfate, and aluminum sulfate.

5. The method for manufacturing a glass substrate for a magnetic disk according to any one of claims 1 to 4, wherein a content of the additive added to the lubricant is in a range of 0.05 g/L to 1.0 g/L.

6. A method for manufacturing a magnetic disk, comprising a forming step of forming at least a magnetic layer on a glass substrate for a magnetic disk obtained by the method according to any one of claims 1 to 4.