CLAIMS

1. A method for manufacturing a magnetic-disk glass substrate comprising performing cleaning processing in which a glass substrate surface polished to a mirror-finished surface is brought into contact with an alkaline cleaning liquid and cleaned,

wherein a glass composition of the glass substrate includes at least one of sodium and potassium,

the cleaning liquid used in the cleaning processing contains an organic alkali represented by General Formula I:

$[(R)_4N]^+OH^-$

where R represents an alkyl group, and at least one of four alkyl groups binding to a N atom has at least one hydroxyl group (OH group), and

the cleaning processing is performed while an increase of a content of sodium ions and potassium ions in the cleaning liquid is suppressed by means of addition of a chelating agent for capturing alkali metal ions, dilution with water or exchange of a cleaning liquid.

2. The method for manufacturing a magnetic-disk glass substrate according to claim 1, wherein at least one of four Rs binding to the N atom in the organic alkali is a linear alkyl group having a hydroxyl group at a terminus that does not bind to the N atom.

3. The method for manufacturing a magnetic-disk glass substrate according to claim 2, wherein the linear alkyl group having a hydroxyl group at a terminus that does not bind to the N atom in the organic alkali has two or more carbon atoms between the N atom and the hydroxyl group.

4. The method for manufacturing a magnetic-disk glass substrate according to any of claims 1 to 3, wherein the cleaning processing is performed while a total amount of sodium ions and potassium ions in the cleaning liquid is

suppressed to 4 millimole/L or less.

5. A method for manufacturing a magnetic-disk glass substrate comprising performing cleaning processing in which a glass substrate surface polished to a mirror-finished surface is brought into contact with an alkaline cleaning liquid and cleaned,

wherein a glass composition of the glass substrate includes at least one of sodium and potassium,

the cleaning liquid used in the cleaning processing contains an organic alkali represented by General Formula I:

$[(R)_4N]^+OH^-$

where R represents an alkyl group, and at least one of four alkyl groups binding to a N atom has at least one hydroxyl group (OH group), and

the cleaning processing is performed under a condition that a total amount of sodium ions and potassium ions in the cleaning liquid is 4 millimole/L or less.

6. A method for manufacturing a magnetic-disk glass substrate comprising performing cleaning processing in which a glass substrate surface polished to a mirror-finished surface is brought into contact with an alkaline cleaning liquid and cleaned,

wherein a glass composition of the glass substrate includes at least one of sodium and potassium,

the cleaning liquid used in the cleaning processing contains an organic alkali represented by General Formula I:

$[(R)_4N]^+OH^-$

where R represents an alkyl group, and at least one of four alkyl groups binding to a N atom has at least one hydroxyl group (OH group), and

a relationship between an amount of increase in surface roughness (Ra) of a main surface of the glass substrate after being subjected to the cleaning

processing with respect to surface roughness (Ra) before the cleaning processing and a total amount of sodium ions and potassium ions in the cleaning liquid is obtained in advance, the total amount of sodium ions and potassium ions in the cleaning liquid is determined based on the obtained relationship such that the amount of increase in the surface roughness (Ra) is 0.05 nm or less, and the cleaning processing is performed while a condition that the total amount of sodium ions and potassium ions in the cleaning liquid is less than or equal to the determined total amount is maintained.

7. The method for manufacturing a magnetic-disk glass substrate according to any of claims 1 to 6, wherein the cleaning liquid further contains at least one selected from N,N'-tetramethylethylenediamine and derivatives of N,N'-tetramethylethylenediamine.

8. A method for manufacturing a magnetic-disk glass substrate comprising performing cleaning processing in which a glass substrate surface polished to a mirror-finished surface is brought into contact with an alkaline cleaning liquid and cleaned,

wherein a glass composition of the glass substrate includes at least one of sodium and potassium,

the cleaning liquid used in the cleaning processing contains at least one alkaline agent selected from N,N'-tetramethylethylenediamine, and derivatives of N,N'-tetramethylethylenediamine, and

in order to reduce roughening of the glass substrate surface caused by the cleaning processing, the cleaning processing is performed while an increase of a content of sodium ions and potassium ions in the cleaning liquid used in the cleaning processing is suppressed by means of addition of a chelating agent for capturing alkali metal ions, dilution with water or exchange of a cleaning liquid.

9. The method for manufacturing a magnetic-disk glass substrate according to claim 8, wherein the cleaning processing is performed while a total

amount of sodium ions and potassium ions in the cleaning liquid is suppressed to 4 millimole/L or less.

10. A method for manufacturing a magnetic-disk glass substrate comprising performing cleaning processing in which a glass substrate surface polished to a mirror-finished surface is brought into contact with an alkaline cleaning liquid and cleaned,

wherein a glass composition of the glass substrate includes at least one of sodium and potassium,

the cleaning liquid used in the cleaning processing contains at least one alkaline agent selected from N,N'-tetramethylethylenediamine, and derivatives of N,N'-tetramethylethylenediamine, and

the cleaning processing is performed under a condition that a total amount of sodium ions and potassium ions in the cleaning liquid is 4 millimole/L or less.

11. A method for manufacturing a magnetic-disk glass substrate comprising performing cleaning processing in which a glass substrate surface polished to a mirror-finished surface is brought into contact with an alkaline cleaning liquid and cleaned,

wherein a glass composition of the glass substrate includes at least one of sodium and potassium,

the cleaning liquid used in the cleaning processing contains at least one alkaline agent selected from N,N'-tetramethylethylenediamine, and derivatives of N,N'-tetramethylethylenediamine, and

a relationship between an amount of increase in surface roughness (Ra) of a main surface of the glass substrate after being subjected to the cleaning processing with respect to surface roughness (Ra) before the cleaning processing and a total amount of sodium ions and potassium ions in the cleaning liquid is obtained in advance, the total amount of sodium ions and potassium

ions in the cleaning liquid is determined based on the obtained relationship such that the amount of increase in the surface roughness (Ra) is 0.05 nm or less, and the cleaning processing is performed while a condition that the total amount of sodium ions and potassium ions in the cleaning liquid is less than or equal to the determined total amount is maintained.

12. The method for manufacturing a magnetic-disk glass substrate according to any of claims 1 to 5 and 7 to 10, wherein a difference between surface roughness (Ra) of a main surface of the glass substrate after being subjected to the cleaning processing and surface roughness (Ra) of a main surface of the glass substrate just before the cleaning processing is 0.05 nm or less.

13. The method for manufacturing a magnetic-disk glass substrate according to any of claims 1 to 12, wherein the cleaning processing is performed after polishing processing in which a main surface of the glass substrate is polished using a polishing liquid that contains colloidal silica abrasive particles and is adjusted so as to be in an acidic range.

14. A method for manufacturing a magnetic disk comprising forming at least a magnetic recording layer on the magnetic-disk glass substrate manufactured with the method for manufacturing a magnetic-disk glass substrate according to any of claims 1 to 13.