CLAIMS

1. A method for manufacturing a magnetic-disk glass substrate to be applied to a magnetic disk compatible with a DFH head that is equipped with a HDI sensor and is capable of controlling a protruding amount of at least one of a recording element and a reproduction element based on a signal from the HDI sensor,

the method comprising polishing processing for supplying a polishing liquid containing colloidal silica between a main surface of a glass substrate and a polishing pad, bringing the glass substrate and the polishing pad into contact with each other, and mirror-polishing the main surface of the glass substrate, and

wherein the polishing liquid has the content of aluminum which is adjusted in order to prevent occurrence of foreign matter containing elements of aluminum (Al), silicon (Si), and oxygen (O) at least in an acidic environment, the foreign matter consisting of a flat layered foreign matter having sizes in a plane which are in range of 30 to 200 nm and having a size of a thickness which is in a range of 1 to 20 nm.

2. A method for manufacturing a magnetic-disk glass substrate to be applied to a magnetic disk compatible with a DFH head that is equipped with a HDI sensor and is capable of controlling a protruding amount of at least one of a recording element and a reproduction element based on a signal from the HDI sensor,

the method comprising polishing processing for supplying a polishing liquid containing colloidal silica between a main surface of a glass substrate and a polishing pad, bringing the glass substrate and the polishing pad into contact with each other, and mirror-polishing the main surface of the glass substrate,

wherein a polishing liquid that does not contain foreign matter containing elements of aluminum (Al), silicon (Si), and oxygen (O) that can inhibit recording or reproduction when the glass substrate is made into a magnetic disk and undergoes recording or reproduction with a magnetic head is selected as the polishing liquid, and the polishing processing is performed using the selected polishing liquid, the foreign matter consisting of a flat layered foreign matter having sizes in a plane which are in range of 30 to 200 nm and having a size of a thickness which is in a range of 1 to 20 nm.

3. The method for manufacturing a magnetic-disk glass substrate according to claim 1 or 2, wherein the foreign matter is a layered compound having a ratio of the size of the plane to the size of the thickness which in a range of 5 to 200.

4 . The method for manufacturing a magnetic-disk glass substrate according to any of claims 1 to 3, wherein the colloidal silica is manufactured by an ion exchange method.

5. The method for manufacturing a magnetic-disk glass substrate according to any of claims 1 to 4, wherein a content of aluminum (Al) in the colloidal silica is 5 μg/g or less.

6. The method for manufacturing a magnetic-disk glass substrate according to any of claims 1 to 5, wherein cleaning processing is performed on the glass substrate after the polishing processing, under a condition that a difference in a surface roughness Rq of the glass substrate before cleaning and after cleaning is 0.05 nm or less.

7. The method for manufacturing a magnetic-disk glass substrate according to any of claims 1 to 6, wherein the magnetic-disk glass substrate comprises a glass substrate to be used in a magnetic disk to be provided in a hard disk drive for a server.

8. A method for manufacturing a magnetic-disk glass substrate to be applied to a magnetic disk compatible with a DFH head that is equipped with a HDI sensor and is capable of controlling a protruding amount of at least one of a recording element and a reproduction element based on a signal from the HDI sensor,

the method comprising polishing processing for supplying a polishing liquid containing colloidal silica between a main surface of a glass substrate and a polishing pad, bringing the glass substrate and the polishing pad into contact with each other, and mirror-polishing the main surface of the substrate,

wherein the polishing liquid has the content of aluminum which is adjusted in order to prevent occurrence of foreign matter that can inhibit recording or reproduction when the glass substrate is made into a magnetic disk and undergoes recording or reproduction with the DFH head, the foreign matter consisting of a flat layered foreign matter having sizes in a plane which are in range of 30 to 200 nm and having a size of a thickness which is in a range of 1 to 20 nm.

9. A method for manufacturing a magnetic disk, in which at least a magnetic film is formed on a main surface of a magnetic-disk glass substrate obtained by the method for manufacturing a magnetic-disk glass substrate according to any of claims 1 to 8.

10. A magnetic-disk glass substrate having a main surface,

wherein an arithmetic mean roughness Ra obtained when a measurement region of 1 μm×1 μm square of the main surface of the substrate is measured using an atomic force microscope at a resolution of 256×256 pixels is 0.15 nm or less and an arithmetic mean roughness Ra having a wavelength bandwidth of 30 to 200 nm is 0.06 nm or less, and

when the main surface of the substrate is irradiated with laser light having a wavelength of 405 nm and a power of 80 mW at a spot diameter of 6 μm and foreign matter is detected using scattered light from the main surface of the substrate, a number of defects having a size of 30 to 200 nm in an in-plane direction per main surface is 30 or less and the detected defects do not include a flat layered foreign matter having sizes in a plane which are in range of 30 to 200 nm and having a size of a thickness which is in a range of 1 to 20 nm.