liquid inhibits the irregularities formation by the surface treatment liquid due to the presence of the moisture, and as a result, irregularities having a relatively coarse surface roughness can be formed on the quartz glass surface.

[0012]

Therefore, the present invention provides the following method for producing quartz glass.

1. A method for producing quartz glass with irregularities on a glass surface by performing surface treatment of quartz glass using a surface treatment liquid, the method including: bringing a solvent component not involved in the surface treatment with the surface treatment liquid into contact with the surface of quartz glass in advance; and then performing the surface treatment with the surface treatment liquid before the solvent component is dried to form irregularities having a surface roughness (Ra) of 1.5 to 3.5 μm on the glass surface.

2. The method for producing quartz glass according to 1 above, wherein the solvent component not involved in the surface treatment is water or pure water.

3. The method for producing quartz glass according to 1 or 2 above, wherein the method of bringing a solvent component not involved in the surface treatment into contact with the surface of quartz glass is a method in which the solvent component over the quartz glass surface is flown, a method in which the solvent component is sprayed with an atomizer, and a method in which a mist of the solvent component is generated or the solvent component is brought into contact with the quartz glass surface in a state that humidity caused by the solvent component is 70% or more.

4. The method for producing quartz glass according to any one of 1 to 3 above, wherein a component of the surface treatment liquid of quartz glass is a mixed acid containing HF, NH_4F, and acetic acid.

5. The method for producing quartz glass according to any one of 1 to 4 above, wherein the quartz glass produced by the production method is a quartz glass jig used in a film forming process in semiconductor manufacturing.

6. The method for producing quartz glass according to 5 above, wherein the quartz glass jig is a quartz capillary with an inner diameter of 4.0 to 100.0 mm and an outer diameter of 8.0 to 106.0 mm.

[0012a]

In one aspect, there is provided a method for producing quartz glass with irregularities on a glass surface by performing surface treatment of quartz glass using a surface treatment liquid, the method comprising: bringing a solvent component not involved in the surface treatment with the surface treatment liquid into contact with the surface of quartz glass in advance; and then performing the surface treatment with the surface treatment liquid before the solvent component is dried to form irregularities having a surface roughness (Ra) of 1.5 to 3.5 μm on the glass surface, wherein the method of bringing a solvent component not involved in the surface treatment into contact with the surface of quartz glass is a method in which the solvent component over the quartz glass surface is flown, a method in which the solvent component is sprayed with an atomizer, and a method in which a mist of the solvent component is generated or the solvent component is brought into contact with the quartz glass surface in a state that humidity caused by the solvent component is 70% or more; and wherein a component of the surface treatment liquid of quartz glass is a mixed acid containing HF, NH_4F, and acetic acid.

CLAIMS:

1. A method for producing quartz glass with irregularities on a glass surface by performing surface treatment of quartz glass using a surface treatment liquid, the method comprising: bringing a solvent component not involved in the surface treatment with the surface treatment liquid into contact with the surface of quartz glass in advance; and then performing the surface treatment with the surface treatment liquid before the solvent component is dried to form irregularities having a surface roughness (Ra) of 1.5 to 3.5 μm on the glass surface,

wherein the method of bringing a solvent component not involved in the surface treatment into contact with the surface of quartz glass is a method in which the solvent component over the quartz glass surface is flown, a method in which the solvent component is sprayed with an atomizer, and a method in which a mist of the solvent component is generated or the solvent component is brought into contact with the quartz glass surface in a state that humidity caused by the solvent component is 70% or more; and

wherein a component of the surface treatment liquid of quartz glass is a mixed acid containing HF, NH_4F, and acetic acid.

2. The method for producing quartz glass according to claim 1, wherein the solvent component not involved in the surface treatment is water or pure water.

3. The method for producing quartz glass according to any one of claims 1 to 4, wherein the quartz glass produced by the production method is a quartz glass jig used in a film forming process in semiconductor manufacturing.

4. The method for producing quartz glass according to claim 5, wherein the quartz glass jig is a quartz capillary with an inner diameter of 4.0 to 100.0 mm and an outer diameter of 8.0 to 106.0 mm.

5. The method for producing quartz glass according to any one of claims 1 to 4, wherein the method of bringing a solvent component not involved in the surface treatment

into contact with the surface of quartz glass is a method in which the solvent component is brought into contact with the quartz glass surface in a high humidity state, after the solvent component is held for 30 minutes or more in an environment of a humidity of 75% or more and a normal temperature of from 15° to 25°C.