What is Claimed

[Claim 1] A quartz glass crucible characterized in that a peak of a distribution of a total concentration of Na, K, and Ca in a depth direction from an inner surface of the crucible is present within a depth range of 32 μm or less from the inner surface.

[Claim 2] The quartz glass crucible according to Claim 1, wherein

the peak of the total concentration of Na, K, and Ca is present within a depth range of 16 μm or more and 32 μm or less from the inner surface.

[Claim 3] The quartz glass crucible according to Claim 2, wherein

the peak value of the total concentration of Na, K, and Ca within the range of 16 μm or more and 32 μm or less from the inner surface is 2 times or more and 19 times or less an average value of the total concentration of Na, K, and Ca within a depth range of 0 μm or more and 8 μm or less from the inner surface.

[Claim 4] The quartz glass crucible according to Claim 2 or 3, wherein

an average value of the total concentration of Na, K, and Ca within a depth range of 32 μm or more and 1000 μm or less from the inner surface is 0.6 times or more and 1 time or less the average value of the total concentration of Na, K, and Ca within a depth range of 0 μm or more and 8 μm or less from the inner surface.

[Claim 5] The quartz glass crucible according to Claim 4, wherein

a total concentration of Na, K, and Ca within a depth range of 32 μm or more and 1000 μm or less from the inner surface has a negative concentration gradient with the depth direction as a positive direction.

[Claim 6] The quartz glass crucible according to any one of Claims 2 to 5, wherein

an average value of a total concentration of Li, Al, Na, K, and Ca within a depth range of 0 μm or more and 8 μm or less from the crucible inner surface is 3.6×10^{16} atoms/cc or more and 5.5×10^{17} atoms/cc or less.

[Claim 7] The quartz glass crucible according to any one of Claims 1 to 6 comprising:

a transparent layer made of silica glass containing no bubbles and constituting the inner surface; and

a bubble layer made of silica glass containing a large number of bubbles and provided outside the transparent layer, wherein

a thickness of the transparent layer is 1 mm or more.

[Claim 8] A manufacturing method of a quartz glass crucible

comprising:

producing a quartz glass crucible by arc-melting raw material quartz powder deposited on an inner surface of a rotating mold;

washing an inner surface of the quartz glass crucible with pure water thereby reducing a total concentration of Na, K, and Ca contained in a silica glass around the inner surface as compared to that before washing; and

etching the inner surface with washing liquid containing hydrofluoric acid.

[Claim 9] The manufacturing method of a quartz glass crucible according to Claim 8, wherein

a specific resistance of the pure water used in the washing step of the inner surface of the quartz glass crucible with the pure water is 17 MΩ cm or more, the amount of water to be used per quartz glass crucible is 125 liters or more, and the water temperature is 45 to 99°C.

[Claim 10] The manufacturing method of a quartz glass crucible according to Claim 8 or 9, wherein

the degree of etching at the inner surface is 5 μm or more and 10 μm or less and, whereby a peak of the total concentration of Na, K, and Ca is set within a depth range of 16 μm or more and 32 μm or less from the inner surface.