

CLAIMS

1. A method for manufacturing a bonded SOI wafer by bonding a bond wafer and a base wafer, each composed of a silicon single crystal, via an insulator film, comprising the step of:

depositing a polycrystalline silicon layer on the bonding surface side of the base wafer,

polishing a surface of the polycrystalline silicon layer,

forming the insulator film on the bonding surface of the bond wafer,

bonding the polished surface of the polycrystalline silicon layer of the base wafer and the bond wafer via the insulator film, and

thinning the bonded bond wafer to form an SOI layer; wherein,

as the base wafer, a silicon single crystal wafer having a resistivity of $100\ \Omega\cdot\text{cm}$ or more is used,

the step for depositing the polycrystalline silicon layer further comprises a stage for previously forming an oxide film on the surface of the base wafer on which the polycrystalline silicon layer is deposited, the oxide film is formed by wet cleaning, and

the polycrystalline silicon layer is deposited at a temperature of 900°C or more and 1010°C or less.

2. The method for manufacturing a bonded SOI wafer according to claim 1, wherein the oxide film is formed by wet cleaning.

3. The method for manufacturing a bonded SOI wafer according to any one of claim 1, wherein a heat treatment is performed in a non-oxidizing atmosphere at a temperature

higher than the temperature at which the polycrystalline silicon layer is deposited after depositing the polycrystalline silicon layer, and afterward the base wafer and the bond wafer are bonded.

4. The method for manufacturing a bonded SOI wafer according to claim 3, wherein the polycrystalline silicon layer has a thickness of 2 μm or more when the base wafer and the bond wafer are bonded.

5. A bonded SOI wafer comprising:
a base wafer composed of a silicon single crystal,
a polycrystalline silicon layer on the base wafer,
an insulator film on the polycrystalline silicon layer,
and
an SOI layer on the insulator film; wherein
the base wafer has a resistivity of 100 $\Omega\cdot\text{cm}$ or more,
and
the oxygen concentration at the boundary of the base wafer and the polycrystalline silicon layer is higher than the oxygen concentration in the base wafer and the oxygen concentration in the polycrystalline silicon layer, and
a layered-continuous oxide film does not exist at the boundary of the base wafer and the polycrystalline silicon layer.