

CLAIMS

1. A method for producing a SOI wafer, comprising:
implanting at least one type of gas ion selected from a hydrogen ion and a rare gas ion from a surface of a bond wafer formed of a silicon single crystal to form an ion implanted layer, bonding the ion-implanted surface of the bond wafer to a surface of a base wafer formed of a silicon single crystal through a silicon oxide film formed on the base wafer surface, delaminating the bond wafer at the ion implanted layer by performing delamination heat treatment to fabricate a SOI wafer having a buried oxide film layer and a SOI layer on the base wafer, and performing flattening heat treatment on the SOI wafer in an atmosphere containing argon gas, wherein,

after the delamination heat treatment, without inserting another heat treatment, processing to remove silicon thin pieces present on the silicon oxide film in a terrace portion of the SOI wafer is performed, and thereafter, the flattening heat treatment is performed in the atmosphere containing argon gas,

after the processing to remove the silicon thin pieces is performed, and before the flattening heat treatment is performed in the atmosphere containing argon gas, sacrificial oxidation treatment is performed on the SOI layer of the SOI wafer,

the silicon thin pieces are removed by performing, as the processing to remove the silicon thin pieces, etching to reduce a thickness of the silicon oxide film in the terrace portion by using an aqueous solution containing HF, or cleaning is performed by a physical action.