

In the case of the figure, the joining part 40 is provided between the joining surface 39 of the first ring body 34 and the joining surface 39 of the second ring body 36. The joining part 40 is made of a eutectic alloy of silicon and silicon containing a metal forming a eutectic alloy with silicon. The metal forming a eutectic alloy with silicon is any one of Al, Ga, Ge, and Sn (hereinafter, also referred to as "alloying metal"). The metals Al, Ga, Ge, and Sn are preferable because each of the metals has a low diffusion coefficient in silicon crystal and is little diffused in a silicon member, hardly forms a deep level that becomes an electric problem, and has no influence on environment. The most preferable metal is Al because of low price. The purity of the alloying metal is not particularly limited as long as the alloying metal can form a eutectic with silicon, and the purity of the alloying metal is preferably 98% or more.

[0018] Each of the silicon members 38 preferably has a thickness of 1 mm or more and 50 mm or less and a width of 10 mm or more and 100 mm or less, and a length L of a line segment connecting two corner vertices 42 and 44 that are not adjacent to each other on the joining surface 39 is preferably 160 mm or more and 220 mm or less. Each of the silicon members 38 having the above-described size can be cut out and fabricated from a silicon crystal ingot for 6-inch (150 mm) wafer that is currently widely distributed. The cost merit is high.

[0019] Next, a method of manufacturing the ring 32 for the electrode is described. First, surface treatment is performed on the silicon members 38. More specifically, surfaces of the respective silicon members 38 are treated by grinding, polishing, or the like, to preferably form mirror surfaces. The surfaces of the respective silicon members 38 may be etched by mixed solution of

Claims

1. A ring for an electrode, comprising:
three or more silicon members having an arc shape;
and
a joining part joining the silicon members, wherein
the joining part contains boron oxide.
2. The ring for the electrode according to claim 1,
wherein the joining part contains any of Al, Ga, Ge, and
Sn, and contains a eutectic alloy with silicon.
3. The ring for the electrode according to claim 1 or 2,
further comprising three or more silicon inner peripheral
members having an arc shape on an inner peripheral
surface, wherein
the joining part is provided between the silicon
members and the silicon inner peripheral members.
4. The ring for the electrode according to any one of
claims 1 to 3, further comprising three or more silicon
outer peripheral members having an arc shape on an outer
peripheral surface, wherein
the joining part is provided between the silicon
members and the silicon outer peripheral members.
5. The ring for the electrode according to any one of
claims 1 to 4, wherein a length of a line segment
connecting two corner vertices of each of the silicon
members, the vertices being not adjacent to each other,
is 160 mm or more and 220 mm or less.