METHOD OF MANUFACTURING SILICON SINGLE CRYSTAL, APPARATUS FOR PULLING SILICON SINGLE CRYSTAL AND VITREOUS SILICA CRUCIBLE

ABSTRACT

Leakage of silicon melt is monitored and touch of a seed crystal at the silicon melt is detected, and in addition, reinforcement of a vitreous silica crucible to be endurable during pulling for a long time and decrease of impurity concentration of a silicon single crystal can be expected.

A method for manufacturing a silicon single crystal is provided. The method includes: detecting touching status of a seed crystal at silicon melt by supplying voltage V1 using a crucible side as a negative electrode and a wire side as a positive electrode and by monitoring change of the voltage, when the seed crystal provided at a front end of the wire touches the silicon melt inside a vitreous silica crucible; devitrifying an inner surface of the vitreous silica crucible as supplying voltage V2 using the crucible side as a positive electrode and the wire side as a negative electrode during a temperature control period; and growing a silicon single crystal by slowly pulling the seed crystal as supplying voltage V3 using the crucible side as a negative electrode and the wire side as a positive electrode after the temperature control period.

FIG. 1