CLAIMS

[Claim 1]

A method of producing a GaAs single crystal, wherein a vertical boat method is performed with a crucible storing a seed crystal, a Si material serving as an impurity, a GaAs material, a solid silicon dioxide, and a boron oxide material, thereby growing a GaAs single crystal.

[Claim 2]

The method of producing a GaAs single crystal according to Claim 1, wherein SiO_2 is previously added into the boron oxide material, and

the sum of an amount of Si of SiO_2 in the boron oxide material and an amount of Si in the solid silicon dioxide exceeds 5 mass% of the boron oxide material.

[Claim 3]

The method of producing a GaAs single crystal according to Claim 1 or Claim 2, wherein in a specific period in the growth of the GaAs single crystal, liquid boron oxide which is a melt of the boron oxide material is stirred.

[Claim 4]

A Si-doped GaAs single crystal wafer, wherein a carrier concentration is higher than 2×10^{18} cm^{-3}, and the maximum value of an etch pit density is 500 cm^{-2} or less.

CLAIMS

[Claim 1]

A method of producing a GaAs single crystal, in which a vertical boat method is performed with a crucible storing a seed crystal, a Si material serving as an impurity, a GaAs material, a solid silicon dioxide, and a boron oxide material previously doped with SiO_2, thereby growing a GaAs single crystal,

wherein the solid silicon dioxide has a plate shape placed between the GaAs material and the boron oxide material and occupies 90 % to 99 % of the area of the upper surface of GaAs melt, which is a melt of the GaAs material, at the start of the crystal growth, and

the amount of Si in SiO_2 previously added to the boron oxide material is 5 mass% or less with respect to the mass of the liquid boron oxide material, whereas the sum of the amount of Si in SiO_2 within the boron oxide material and the amount of Si in the solid silicon dioxide exceeds 5 mass% with respect to the mass of the boron oxide material.

[Claim 2]

The method of producing a GaAs single crystal according to Claim 1, wherein in a specific period in the growth of the GaAs single crystal, liquid boron oxide which is a melt of the boron oxide material is stirred.

[Claim 3]

A Si-doped n-type GaAs single crystal wafer, wherein a carrier concentration is higher than 2×10^{18} cm^{-3}; the maximum value of an etch pit density is 500 cm^{-2} or less; the B concentration is 1.9×10^{18} cm^{-3} to 6×10^{18} cm^{-3}; and the Si concentration is 4.3×10^{18} cm^{-3} to 6.2×10^{18} cm^{-3}.