ABSTRACT

LOW DEFECT DENSITY, SELF-INTERSTITIAL DOMINATED SILICON

The present invention relates to single crystal silicon, in ingot or wafer form, which contains an axially symmetric region which is free of agglomerated intrinsic point defects, and a process for the preparation thereof. The process for growing the single crystal silicon ingot comprises controlling (i) a growth velocity; v, (ii) an average axial temperature gradient, G_0, during the growth of a constant diameter portion of the crystal over a temperature range from solidification to a temperature of no less than about 1325^0C; and (iii) a cooling rate of the crystal from a solidification temperature to about $1,050^0$C, in order to cause the formation of an axially symmetrical segment which is substantially free of agglomerated intrinsic point defects. This axially symmetric region extends inwardly from the circumferential edge of the ingot, has a width as measured from the circumferential edge radially toward the central axis of the ingot which is at lest about three-tenths the length of the radius of the ingot, and has a length as measured along the central axis of at least about two-tenths the length of the constant diameter portion of the ingot.

No Figure