ABSTRACT

LOW DEFECT DENSITY 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 comprises controlling growth conditions, such as growth velocity, v, instantaneous axial temperature gradient, G_0, and the cooling rate, within a range of temperatures at which silicon self-interstitials are mobile, in order to prevent the formation of these agglomerated defects. In ingot form, the axially symmetric region has a width, as measured from the circumferential edge of the edge of the ingot radially toward the central axis, which is least about 30% the length of the radius of the ingot. The axially symmetric region additionally has a length, as measured along the central axis, which is at least about 20% the length of the constant diameter portion of the ingot.

No Figure