ZnO Single Crystal Substrate

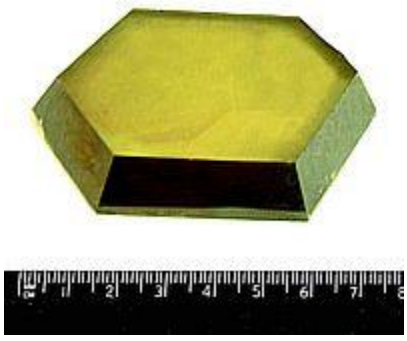
A new substrate for III-V Nitrides

Typical Properties

Purity wt% Impurity: wt%	> 99.99 Mg: <.0005 Al: < .0030 Si: 0.0030 Ti: .0010 Cu: < .0030 Fe: < 0.005 Ca: <.0005 Ag: < .0002
Crystal Structure	Hexagonal: a= 3.252 å , c = 5.313 å
Growth Method	Hydrothermal
Hardness	4 moh scale
Density	5.7 g/cm^3
Melt Point	1975 ^{o}C
Specific heat	0.125 cal/gm
Thermoelectric Constant	1200 μV /^{o}K @ 300 ^{o}C
Thermal conductivity	0.006 cal/cm/ ^{o}K
Thermal expansion	2.90 x 10-6/^{o}K
Transmission range	0.4 - 0.6 μ > 50% at 2 mm
Dislocation Density	<0001> plane <100 / cm^2
Availability of Standard Substrate	
Orientation	<0001>
Polished surface	EPI polished on one side or two sides to Ra < 10 Å
Standard Size	10x10 mm , 5 x 5 mm and 20x20 mm
Thickness	0.35 mm, 0.5 mm and 1.0 mm

Special Orientation is available upon request

About ZnO (Zincite) Growth Method



ZnO crystals are manufactured by the hydrothermal technology. Its advantage is the size of the grown crystals and excellent quality.

Growing ZnO by hydrothermal method is quite a slow process, which allows to achieve a very high quality of the crystal, without block marks, twins and dislocations. Hydrothermal ZnO single crystals are grown in high pressure autoclaves by means of direct temperature drop in aqueous solutions of KOH + LiOH at crystallization temperature 320- 400 ^{o}C and pressure 20-70 MPa. Inside the autoclaves there are special vessels made of corrosion-resistant alloys – they serve to protect autoclaves from corrosion. The charge, the bait and the chemical solution are put into the vessel, then the vessel is hermetically sealed and placed into the autoclave. Finally the autoclave is filled with water and is also sealed hermetically. After that the autoclave is heated to the fixed temperature. The whole production cycle takes 100-150 days.

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