

Technical Specification of CVD Coatings – Opticals and Semiconductors

Boron (B), Zinc Sulphide (ZnS), Zinc Selenide (ZnSe) and Gallium Arsenide (GaAs)

Applications

B – used for ceramic coatings, automotive engines and it is resistant to acid corrosion.

ZnS – used for optical filters, heat mirrors and ultra-fast optoelectronic switches.

ZnSe – used within optical elements such as passive laser optical elements.

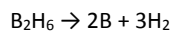
GaAs – used in diodes, fields-effect transistors and integrated circuits.

Properties

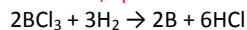
Coating	B	ZnS	ZnSe	GaAs
Purity (%)	99.6	>99.9	>99.9	99.9
Density (g/cm ³)	2.35	4.09	5.27	5.31
Flexural Strength (MPa)	1.6-3.1	60	50	55
Hardness (Kg/mm ²)	3300	166	112	730
Thermal Expansion Coefficient (10 ⁻⁶ /°C)	4.8	7.5-7.8	7.6-8.2	6.9
Thermal Conductivity (W/mK)	60	0.15	0.13	370
Electrical Resistivity (Ωcm)	1.8x10 ⁶	1x10 ⁸ -1x10 ¹²	5x10 ⁻² -1x10 ⁶	300
Standard Thickness	20-28µm	<25mm	<25mm	<3µm
Oxidation Temperature (°C)	700	700	950	427
Friction Coefficient	0.4	0.09-0.15	0.1	0.2-0.3
Colour	Black-brown	White-yellow	Light yellow	Grey

CVD Methods

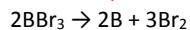
B:



400-900°C, up to 1atm

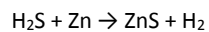


900-1300°C, 1atm



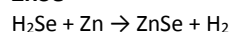
1000-1500°C, 1Torr

ZnS:



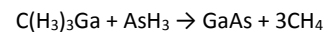
600-800°C, <100Torr

ZnSe



600-800°C, <100Torr

GaAs:



650-730°C, 1atm



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