



Properties of Single Crystal Sapphire 单晶蓝宝石特性

Chemical Properties	
Chemical formula/纯度	99.997Al ₂ O ₃
Physical Properties	
Crystal structure/晶胞参数	a=4.785Å, c=12.991Å
Density/密度	3.98g/cm ³
Hardness/莫氏硬度	9
Tensile strength/拉伸强度	0.4GPa@25°C, 0.35GPa@1000°C
Compressive strength/耐压强度	2.1GPa@25°C
Flexural strength/抗弯曲强度	0.6GPa@25°C
Young's modulus/杨氏模量	350GPa@25°C
Compressive modulus/压缩模量	380GPa@25°C
Flexural modulus/弯曲模量	360GPa@25°C
Rigidity modulus/刚性模量	150GPa@25°C
Bulk modulus/体积弹性模量	240GPa@25°C
Poisson's ratio/泊松比	0.29
Frictional coefficient/摩擦系数	蓝宝石-钢: 0.15, 蓝宝石-蓝宝石: 0.1
Thermal Properties	
Melting point/熔点	2045°C
Application temperature/应用温度	2000°C
Thermal expansion/热膨胀系数	5.8*10 ⁻⁶ /k
Heat capacity/热容量	18.6cal (Mol•°C) , (25 °C) , 30cal (Mol•°C) , (1000°C)
Thermal conductivity/热导率	25.12W/m/k (@100°C)
Specific heat/比热	0.418W.s/g/k
Optical Properties	
Fraction/折射率	no=1.768 ne=1.760
Optical transmission/波段	0.3~5μm
Reflection loss/反射损失	20%
Electrical Properties	
Electrical resistivity/电阻率	绝缘
Dielectric constant/介电常数	11.5(//c),9.3(⊥c)
Dielectric strength/电介质强度	480kVcm ⁻¹ (60Hz
Dielectric dissipation/电介质消耗	0.00006//与C轴, 0.00003⊥与C轴 (10GHz)