

## Sapphire Technical Data

**Transmission Range:** 0.17 to 5.5  $\mu\text{m}$

**Refractive Index:** No 1.75449; Ne 1.74663 at 1.06  $\mu\text{m}$  (1)

**Reflection Loss:** 14% at 1.06  $\mu\text{m}$

**Absorption Coefficient:**  $0.3 \times 10^{-3} \text{ cm}^{-1}$  at 2.5  $\mu\text{m}$  (2)

**Reststrahlen Peak:** 13.5  $\mu\text{m}$

**$Dn/dT$ :**  $13.1 \times 10^{-6}$  at 9.546  $\mu\text{m}$  (3)

**$Dn/d\mu = 0$ :** 1.5  $\mu\text{m}$

**Density:** 3.97g/cc

**Melting Point:** 2040°C

**Thermal Conductivity:** 27.21 W  $\text{m}^{-1} \text{K}^{-1}$  at 300K

**Thermal Expansion:** 5.6 (para) & 5.0 (perp)  $\times 10^{-6}/\text{K}^*$

**Hardness:** Knoop 2000 with 2000g indenter

**Specific Heat Capacity:** 763 J  $\text{Kg}^{-1} \text{K}^{-1}$  at 1MHz

**Youngs Modulus (E):** 335 GPa

**Shear Modulus (G):** 148.1 GPa

**Bulk Modulus (K):** 240 GPa

**Elastic Coefficients:** C11=496 C12=164 C13=115 C33=498 C44=148

**Apparent Elastic Limit:** 300 MPa (45,000 psi)

**Poisson Ratio:** 0.25

**Solubility:**  $98 \times 10^{-6}$  g/100g water

**Molecular Weight:** 101.96

**Class/Structure:** Trigonal (hex), R3c