



Characteristics of synthetic Sapphire

Physical properties

crystalline structure
chemical formula
purity
cleavage
specific gravity

hexagonal
 Al_2O_3
99.997
conchoidal
3.98

%
 g / cm^3

Thermal properties

melting point
softening point
specific heat at 25°C
thermal conductivity at 25°C
thermal expansion (face ^ to c axis)
thermal expansion (face = to c axis)

2040
1800
0.18
0.1
 $5.0 \cdot 10^{-6}$
 $6.7 \cdot 10^{-6}$

°C
°C
cal / g K
cal / sec cm °C
1 / K
1 / K

Mechanical properties

hardness
Knoop scale (face ^ to c axis)
Knoop scale (face = to c axis)
modulus of elasticity
modulus of rupture at 25°C
compressive strength at 25°C
ultimate tensile strength

9
1800 - 2200
1175 - 1380
 $3.6 - 4.4 \cdot 10^6$
4000
21000
1900

Mohs
-
-
 $\text{kg} / \text{cm}^2 \pm 1\%$
 kg / cm^2
 kg / cm^2
 kg / cm^2

Chemical properties

acids and alkalis attack at 300°C
porosity

0
0

Electrical properties

electrical resistance at 500°C
electrical resistance at 1000°C
electrical resistance at 2000°C

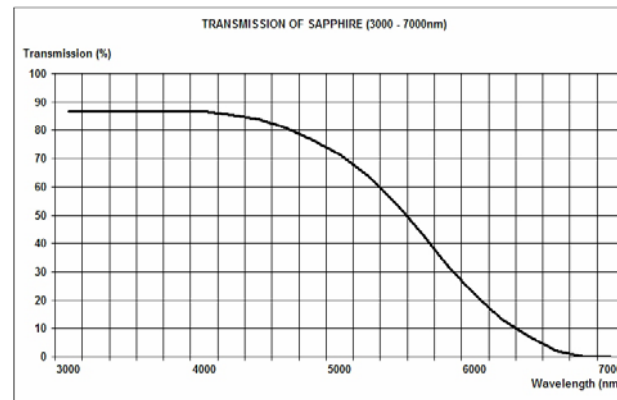
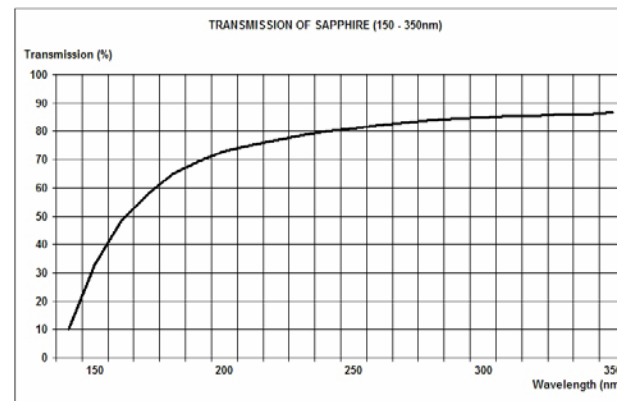
10^{11}
 10^6
 10^3

Ohm / cm
Ohm / cm
Ohm / cm

Optical properties

refractive index at 5893 Å n_d

1.769



Crystallographic diagram of Sapphire

