

GERMANIUM Ge

Crystallographic Ge (Germanium)

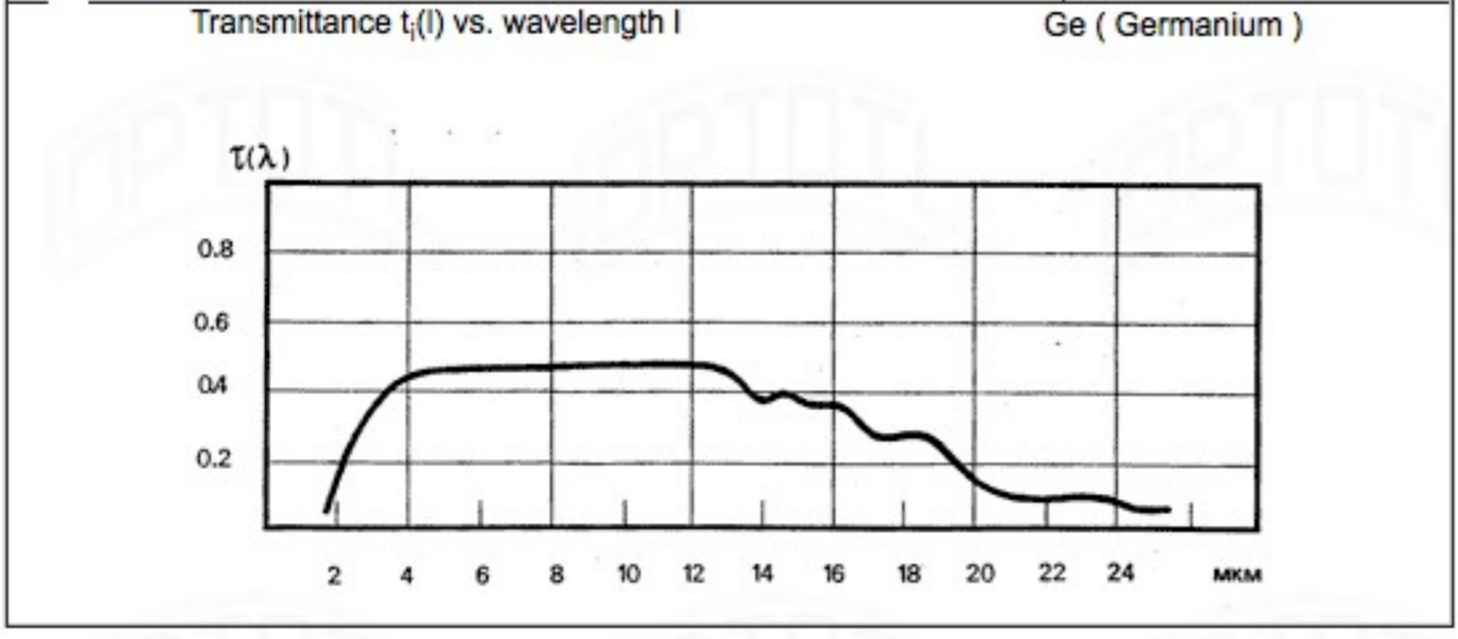
Syngony	Cubic
Symmetry Class	m3m
Lattice Constants, Angstroms	a=5.657 c=a
Cleavability	(111), non-perfect

Optical Ge (Germanium)

Refractive Index at $n_{10.6}$	4.0034
Refractive Index, $n_{8.0}-n_{12.5}$	0.0036
Thermal Coefficient of Refractive Index at $l=3.39$ microns, $^{\circ}C^{-1}$ for $-60^{\circ}C$	$(35.0,40.0) \cdot 10^{-5}$
Transmission Range, microns (thickness 10mm)	1.8,17

l, MKM	$t_i(l)$
2.0	0.97
3.0	0.97
4.0	0.97
5.0	0.97
6.0	0.97
7.0	0.97
8.0	0.97
9.0	0.97
10.0	0.96
12.0	0.70
15.0	0.56
20.0	0.05

l, MKM	$n(l)$
2.0	4.1079
3.0	4.0446
4.0	4.0242
5.0	4.0153
6.0	4.0106
7.0	4.0076
8.0	4.0053
9.0	4.0047
10.0	4.0040
11.0	4.0031
12.0	4.0029
12.5	4.0024
15.0	4.0017



Thermal Ge (Germanium)

Thermal Linear Expansion $\alpha_l, ^{\circ}C^{-1}$ for $\pm 60^{\circ}C$	$(5.1,5.8) \cdot 10^{-6}$
Thermal Conductivity, $W/(m \cdot ^{\circ}C)$ at $27^{\circ}C$	59.8
Specific Heat Capacity, $J/(kg \cdot ^{\circ}C)$ for 20, 100 $^{\circ}C$	309.8
Melting Point, $^{\circ}C$	937

Mechanical Ge (Germanium)

Density, g/cm^3 at $20^{\circ}C$	5.33	
Mohs Hardness	6	
Vickers Microhardness, Pa	$900 \cdot 10^7$	
Constants of Elastic Compliance, Pa^{-1}	S_{11}	$9.69 \cdot 10^{-12}$
	S_{12}	$-2.65 \cdot 10^{-12}$
	S_{44}	$14.89 \cdot 10^{-12}$
Poisson Ratio	0.278	
Young Modulus (E), Pa	<100>	$10.32 \cdot 10^{10}$
	<100>	$15.56 \cdot 10^{10}$
Shear Modulus (G), Pa	(100)	$4.67 \cdot 10^{10}$
	(100)	$6.72 \cdot 10^{10}$

Chemical Ge (Germanium)

Solubility Ge	
in water at $20^{\circ}C$ $g/100cm^3$	in acids
insoluble	soluble

"Opto-Technological Laboratory" produces lenses, windows, prisms, wedges, ball lenses, cylindrical lenses and others optical components according to customers' specifications and drawings out of crystals germanium (Ge).