

Properties of YIG and GaYIG

Property	Symbol	YIG	GaYIG	Units
Empirical Formula		$Y_3Fe_5O_{12}$	$Ga_xY_3Fe_{5-x}O_{12}$	
Magnetization Saturation	$4\pi M_s$	1780	400	Gauss
Formula Weight		737.95	751.13	
Ferrimagnetic Resonance Linewidth	ΔH	<0.3	<0.9	Oersted
Gyromagnetic Ratio		2.8	2.8	MHz/Gauss
Anisotropy Constant	K_1	-6.2×10^3	-1.7×10^3	erg/cm ³
Anisotropy Constant	K_2	-0.05×10^3		erg/cm ³
Magnetostriction Constant (100)	λ	-1.25×10^{-6}	-0.95×10^{-6}	
Magnetostriction Constant (111)	λ	-2.73×10^{-6}	-0.99×10^{-6}	
Magnetoelastic Constant	b_1	2.95	2.31	erg/cm ³
Magnetoelastic Constant	b_2	6.27	2.45	erg/cm ³
Density		5.17	5.28	g/cm ³
Melting Point		1555	1545	°C
Moh Hardness		7	6.9	
Crystal Structure		Cubic	Cubic	
Curie Temperature	T_c	280	170	°C
Lattice Constant		12.376	12.360	Å
Space Group		1a3d	1a3d	
Resistivity		1×10^{14}	1×10^{14}	W-cm
Thermal Conductivity		0.074		W/cm-°C
Specific Heat		4.5		Cal/mol-E
Thermal Expansion Coefficient		1.04×10^{-4}		°C ⁻¹
Dielectric Constant		16	16	
Effective g Factor		2.0	2.0	
Young's Modulus	Y	2×10^{12}	1×10^{12}	
Poisson Ratio	M	0.29	0.25	
Refractive Index @ 1.3mm	h	2.25		
Absorption Coefficient @ 1.3mm	a	0.1		cm ⁻¹
Transmittance @ 1.3mm *	T	>98	>98	%
Faraday Rotation @ 1.3 mm	F	220		°/cm

* 3 mm path length and Dual AR coated for 1.3 mm