

AgGaSe2 (AGSe)

AgGaSe2 (AGSe) crystals have band edges at 0.73 and 18 μm . Its useful transmission range (0.9 – 18 μm) and wide phase matching capability provide excellent potential for OPO applications when pumped by a variety of different lasers. Tuning within 2.5 – 12 μm has been obtained when pumping by Ho:YLF laser at 2.05 μm ; as well as non-critical phase matching (NCPM) operation within 1.9 – 5.5 μm when pumping at 1.4 – 1.55 μm . AgGaSe2 (AgGaSe2) has been demonstrated to be an efficient frequency doubling crystal for infrared CO2 lasers radiation.

Main features:

- High frequency doubling efficiency for mid-infrared laser
- It can be used for optical parametric amplification, optical parametric oscillation and differential frequency generation
- The application wavelength can reach 18 μm in the middle infrared
- Optical narrow-band filtering in the region near isotropic points



Typical applications:

- Generation second harmonics on CO and CO2 - lasers
- Optical Parametric Oscillator
- Different frequency generator to middle infrared regions up to 18 μm
- Frequency mixing in the middle IR region

Technical Parameters

Parameters	Values & Ranges
Density(g/cm^3)	5.7
Melting point ($^{\circ}\text{C}$)	851
Mohs hardness(Mohs)	3-3.5
Thermal conductivity	1.0 W/M/ $^{\circ}\text{C}$
Thermo-Optic Coefficient	$\text{dno}/\text{dt}=15.0 \times 10^{-5}/^{\circ}\text{C}$ $\text{dne}/\text{dt}=15.0 \times 10^{-5}/^{\circ}\text{C}$
Transparency Range	0.73-18.0 μm
The refractive index @ 1.064 μm @ 5.300 μm @ 10.60 μm	$n_o=2.70102$, $n_e=2.67922$, $n_o=2.67922$, $n_e=2.58082$, $n_o=2.5579$
NLO Coefficients @ 10.6 μm	$d_{36}=d_{24}=d_{15}=39.5 \text{ pm/V}$
Sellmeier Equations(λ in μm)	$n_o^2=4.6453+2.2057/(1-0.1879/\lambda^2)+1.8577/(1-1600/\lambda^2)$ $n_e^2=5.2912+1.3970/(1-0.2845/\lambda^2)+1.9282/(1-1600/\lambda^2)$
Damage Threshold @ ~ 10 ns, 1.064 μm	20-30 MW/ cm^2 (surface)