

## Magnetic susceptibility for gemstones

Magnetic responses are standardized to 1/2" x 1/2" N-52 magnet cylinders. (see <http://kjmagnetics.com>). Colorless and extremely pale stones tend to be inert. (Inert includes diamagnetic). Black opaque stones of many species are strongly magnetic and may pick up or drag. Pick up/drag responses are weight-dependent. Larger garnets may be too heavy to pick up

GEM	VARIETY	COLOR	RESPONSE	CAUSE OF COLOR
Afghanite		blue	inert- - diamagnetic	chromium, vanadium
Allanite		black	picks up	
Amber		any color	inert- - diamagnetic	organic
Amblygonite			inert- - diamagnetic	unknown
Andalusite			inert- - diamagnetic	manganese
Apatite		any color	inert- - diamagnetic	manganese, rare earth
Astrophyllite			strong	iron, manganese
Axinite			drags	iron, manganese
Azurite			strong	copper
Barite		pale brown	inert- - diamagnetic	unknown
Bastnasite	rough		strong	rare earth
Benitoite			inert- - diamagnetic	charge transfer Fe/Ti
Beryl	aquamarine	pale to medium	weak to moderate	iron
	golden	yellow	inert to weak	iron
	heliodor	yellowish green	inert- - diamagnetic	chromium, iron
	maxixe	blue	inert- - diamagnetic	color centers
	morganite		inert- - diamagnetic	manganese
	bixbite	red	weak	manganese
	green beryl	green	inert- - diamagnetic	chromium, vanadium, iron
	emerald	green	weak	chromium, vanadium
Beryl synth.	synth. Emerald	green	weak to moderate	chromium, vanadium
Calcite		most colors	inert- - diamagnetic	various
		pink	weak	cobalt
Cassiterite		pale yellow	inert- - diamagnetic	iron
Cavansite	stabilized cab.		moderate	vanadium
Chalcedony	most agates & jaspers		inert- - diamagnetic	iron
	red jasper	red	weak to picks up	iron
	mahogany jasper	brown	strong	iron
	bloodstone		weak to strong	iron
	carnelian		inert- - diamagnetic	iron
	chrysoprase	green	weak to strong	nickel
	blue chalcedony	blue	inert- - diamagnetic	unknown
	fire agate		picks up	iron
	mtrolite	green	inert- - diamagnetic	chromium
onyx		inert- - diamagnetic	iron	
Charoite			weak	unknown
Chrysoberyl			weak to moderate	iron
Chrysocolla			strong	copper, iron impurities
Clinohumite		red	weak	iron, manganese
		orange	strong	manganese, iron
Coral			inert- - diamagnetic	organic
	reconstructed		moderate	
Cordierite			moderate to strong	iron
Corundum	sapphire	black star	weak to moderate	titanium, iron
		blue	inert (Sri lanka) to moderate	titanium, iron
	ruby	red	weak to moderate	chromium, titanium, iron

GEM	VARIETY	COLOR	RESPONSE	CAUSE OF COLOR
Corundum synth.	synth. ruby	red	inert to strong	chromium, titanium
	synth. sapphire		inert- - diamagnetic	titanium
Cubic zirconium		most colors	inert to weak	various
		pink	drags	rare earth
Danburite		yellow	inert- - diamagnetic	unknown
Diamond		any color	inert- - diamagnetic	carbon, nitrogen, boron
Diamond synth. & CVD			may show magnetic response	
Diaspore			weak	manganese, chromium, iron
Diopside		black star	picks up	iron (magnetite)
	chrome diopside	green	weak to strong	chromium
	vanadium diopside	mint green	weak	vanadium
	green diopside	grayish green	strong	iron, chromium
		yellow	weak	iron
	violane	blue	inert- - diamagnetic	manganese
	violane Aosta		weak to moderate	
Dumortierite			weak	various
Enstatite	transparent		drags	iron
	hypersthene	opaque black	drags	iron
Epidote			drags	iron
Euclase		pale blue	inert- - diamagnetic	iron
Eudialite			strong	manganese, iron
Fabulite			inert- - diamagnetic	
Feldspar	bytownite		weak	unknown
	andesine		weak	copper
	labradorite	Oregon sunstone	weak	copper
		spectrolite	inert- - diamagnetic	
		yellow	weak	iron
	oligoclase	sunstone	inert- - diamagnetic	iron (hematite)
	microcline	amazonite	inert- - diamagnetic	lead, color centers
	orthoclase	moonstone	inert- - diamagnetic	
yellow		weak to moderate	iron	
Fluorite		any color	inert- - diamagnetic	color centers
Garnet	almandine		picks up	iron
	pyrope		picks up	
	spessartine		picks up	
	andradite		picks up	
	uwarovite	green	picks up	iron, chromium
	hessonite	yellow/orange	moderate to strong	iron
	grossular	from Mali	drags	iron
	grossular	pale green	weak to strong	vanadium, chromium
	tsavorite	green	moderate to strong	vanadium, chromium
	rosolite	pink	strong	manganese
hydrogrossular	green	strong	iron, chromium	
Gaspeite			strong	nickel, iron
GGG	art.product		picks up	
Glass	man-made	most colors	inert- - diamagnetic	various
		blue	inert to weak	cobalt
		goldfluss	moderate to strong	copper particles
Glass/garnet	doublet		inert glass side / strong garnet side	iron
Hauyne			weak	unknown
Hematite			picks up	iron
Hematine synth.			picks up	
Hemimorphite		blue	inert- - diamagnetic	copper

GEM	VARIETY	COLOR	RESPONSE	CAUSE OF COLOR
Howlite		white or dyed	inert- - diamagnetic	
Idocrase		green	strong	iron
Iolite			moderate to strong	iron
Ivory			inert- - diamagnetic	organic
Jade	jadeite	green	weak to moderate	iron, chromium
		orange	weak	iron
		red	weak to moderate	iron
		purple	weak to moderate	iron
		white/yellow	inert to weak	
	maw-sit-sit		moderate to strong	chromium
nephrite	black	strong	iron	
	green	moderate to strong	iron	
	white/yellow	inert- - diamagnetic		
Jade				
Jet			inert- - diamagnetic	organic
Kornerupine			strong	iron
Kyanite		blue	inert- - diamagnetic	iron, chromium, titanium
		green	weak	vanadium
Lapis lazuli	natural		inert- - diamagnetic	sulfur, color centers
	Gilson synth		weak to strong	
	reconstructed		weak to strong	
Libyan desert glass			inert- - diamagnetic	iron
Magnesite		white	inert- - diamagnetic	
Malachite			drags	copper
Moldavite			weak	iron
Obsidian		mahogany	picks up	iron
		opaque	drags	iron
		translucent	strong	iron
		transparent	weak to moderate	iron
Olivine	peridot		drags	iron
	forsterite	near colorless	weak	iron
Opal		any color	inert- - diamagnetic	
Pearl			inert- - diamagnetic	organic
Pectolite	larimar	blue	inert- - diamagnetic	copper
Pezzottaite			weak	manganese
Plastic			inert- - diamagnetic	
Prehnite		green	weak to moderate	iron
Psilomelane			strong to drags	manganese
Pyrite			weak	Iron-sulfur
Pyromorphite		opaque	inert- - diamagnetic	unknown
Quartz	amethyst	violet	inert- - diamagnetic	color centers
	citrine	yellow	inert- - diamagnetic	irradiation, some iron
	rock crystal	colorless	inert- - diamagnetic	
	rose quartz	pink	inert- - diamagnetic	manganese, iron
	smoky quartz		inert- - diamagnetic	irradiation
Quartz with inclusions	rutile, hematite & most other inclusions		inert- - diamagnetic	
	tourmaline		weak	iron, copper
	chrysocolla		weak to moderate	copper
	hedenbergite green		weak	iron
	tourmaline blue		weak	copper
	tiger's eye		inert to picks up	iron oxide
	hawk's eye		weak	iron oxide
	pietersite		inert to strong	iron oxide
aventurine quartz		inert to weak	chromium	
Quartz	jasper	any color	inert to picks up	

GEM	VARIETY	COLOR	RESPONSE	CAUSE OF COLOR
Rhodochrosite			picks up	manganese
Rhodonite			picks up	manganese
Rutile		red	strong	iron, titanium
Rutile synth.		colorless	inert to very weak	rare earth
Scapolite			inert- - diamagnetic	color centers
Scheelite		yellow	inert- - diamagnetic	rare earth
Serpentine			drags to picks up	iron, chromium, nickel
Shell			inert- - diamagnetic	organic
Sillimanite		green/yellow	weak	iron, chromium
	fibrolite	gray	weak	iron
Sinhalite			weak	iron
Sodalite			inert to weak	color centers
	hackmanite		inert- - diamagnetic	color centers
Sphalerite		orange/yellow	inert- - diamagnetic	iron
Sphene		yellow	weak	rare earth
		green	weak	chromium
Spinel		Co-blue	moderate	iron, cobalt
		pale colors	inert to weak	iron, cobalt, chromium
		pink, red, blue, black	weak to moderate	iron, cobalt, chromium
Spinel synth.	Verneuil	mint green	inert to moderate	manganese, chromium
		most colors	inert- - diamagnetic	various
		blue	weak in rare cases	
	flux	red	weak	
Spodumene	hiddenite	dark green	unknown	chromium
		greenish yellow	weak	chromium
	kunzite	pink, purple	inert- - diamagnetic	chromium
		pale yellow/green	inert- - diamagnetic	chromium
Staurolite		transparent	picks up	iron, titanium
		opaque	drags	iron
Strontium titanite			inert- - diamagnetic	
Sugilite			drags to picks up	manganese, iron
Topaz			inert- - diamagnetic	color centers, chromium
Tortoise shell			inert- - diamagnetic	organic
Tourmaline	schorl	black	drags	iron
	dravite	brown	inert- - diamagnetic	chromium
	Cr-tourmaline	green	inert- - diamagnetic	chromium
	achroite	colorless	inert- - diamagnetic	
	cuprian paraiba	any color	strong	copper, manganese, Ti
	elbaite	green	strong to drags	iron, chromium, vanadium
		olive green	moderate to strong	iron, chromium, vanadium
	indicolite	blue	drags	iron
	elbaite	pink & mauve	inert to strong	manganese
	elbaite	red (rubellite)	inert to strong	managnese
	elbaite	watermelon	weak	various
elbaite	yellow	inert- - diamagnetic	unknown	
tsilaisite	yellow	drags	manganese	
Turquoise		blue	weak to moderate	copper
		green	weak to strong	copper, iron
	reconstructed		inert- - diamagnetic	
Variscite			inert to moderate	chromium, iron
Vesuvianite			strong	iron
YAG		yellow	inert to weak	various
		green	inert to strong	chromium
		pink	strong to drags	manganese
Zincite synth		orange	inert- - diamagnetic	
Zircon		any color	inert- - diamagnetic	color centers

<b>GEM</b>	<b>VARIETY</b>	<b>COLOR</b>	<b>RESPONSE</b>	<b>CAUSE OF COLOR</b>
Zoisite	tanzanite		inert- - diamagnetic	vanadium
	thulite	pink opaque	picks up	manganese
Bibliography : Kirk Feral - <a href="http://www.gemstonemagnetism.com">www.gemstonemagnetism.com</a>				