Gemstone Species and Ornamental Materials (Excluding Varieties)

Actinolite
Adamite
Albite
Algodonite
Allanite
Almandine
Amber
Amblygonite
Amphibole (G)*
Analcime
Anatase
Andalusite
Andesine
Andradite
Anglesite
Anhydrite
Ankerite
Anorthite
Anorthoclase
Antigorite
Apatite (G)
Apophyllite
Aragonite
Augelite
Axinite (G)
Azurite

Barite
Bayldonite
Benitoite
Beryl
Beryllonite
Bismutotantalite
Boleite
Boracite
Bornite
Brazilianite
Breithauptite
Bronzite
Brookite
Brucite
Buergerite
Bustamite
Bytownite

Calcite
Canasite
Cancrinite
Cassiterite
Catapleiite
Celestite
Ceruleite
Cerussite
Chabazite
Chambersite
Charoite
Childrenite
Chiolite
Chlorapatite
Chondrodite
Chromdravite
Chromite
Chrysoberyl
Chrysocolla
Chrysotile
Cinnabar
Clinochrysotile
Clinohumite
Clinozoisite
Cobaltite
Colemanite
Coral
Cordierite
Corundum
Covellite
Creedite
Crocoite
Cryolite
Cuprite

Danburite
Datolite
Diamond
Diaspore
Dickinsonite
Diopside
Dioptase
Dolomite
Dravite
Dumortierite

Ekanite
Elbaite
Enstatite
Eosphorite
Epidote
Ettringite
Euclase
Eudialyte
Euxenite

Feldspar (G)
Fergusonite
Ferridravite
Ferroaxinite
Ferrosalite
Fluorapatite
Fluorite
Forsterite
Friedelite

Gadolinite
Gahnite
Gahnospinel
Galaxite
Garnet (G)
Gaylussite
Grandidierite
Grossular
Gypsum

Hambergite
Hancockite
Haüyne
Hedenbergite
Hematite
Hemimorphite
Hercynite
Herderite
Hodgkinsonite
Holtite
Hornblende
Howlite
Huebnerite
Humite
Hureaulite
Hurlbutite
Hydrogrossular
Hydroxylapatite
Hypersthene

Idocrase
Inderite

*(G) indicates names referring to groups (not distinct species).

Jade (G)
Jadeite
Jeffersonite
Jeremejevite
Jet

Kämmererite
Kornerupine
Kurnakovite
Kyanite

Labradorite
Langbeinite
Lawsonite
Lazulite
Lazurite (lapis lazuli)
Legrandite
Lepidolite
Leucite
Liddicoatite
Linarite
Lizardite
Ludlamite

Magnesioaxinite
Magnesiochromite
Magnesite
Malachite
Manganaxinite
Manganotantalite
Marcasite
Marialite
Meionite
Meliphanite
(= melinophane)
Mellite
Mesolite
Microcline
Microlite
Milarite
Millerite
Mimetite
Monazite
Montebrasite
Mordenite

Nambulite
Natrolite
Natromontebrasite
Nepheline
Nephrite
Neptunite
Niccolite
Norbergite

Obsidian
Oligoclase
Olivine (peridot) (G)
Opal
Orthoclase
Orthoferrosilite

Painite
Palygorskite
(= attapulgite)
Papagoite
Pargasite
Parisite
Pearl
Pectolite
Pentlandite
Periclase
Petalite
Phenakite
Phosgenite
Phosphophyllite
Piedmontite
Pollucite
Powellite
Prehnite
Prosopite
Proustite
Pumpellyite
(= chlorastrolite)
Purpurite
Pyrargyrite
Pyrite
Pyrope
Pyrophyllite
Pyroxmangite
Pyrrhotite

Quartz

Realgar
Rhodizite
Rhodochrosite
Rhodonite
Rutile

Salite
Samarskite
Sanidine
Sapphirine
Sarcolite
Scapolite (G)
Scheelite
Schefferite
Schorl
Schorlomite
Scolecite
Scorodite
Scorzalite
Sellaite
Senarmontite
Serandite
Serpentine (G)
Shattuckite
Shortite
Siderite
Sillimanite
(= fibrolite)
Simpsonite
Sinhalite
Smaltite
(= skutterudite)
Smithsonite
Sodalite
Sogdianite
Spessartine
Sphalerite
Sphene
(= titanite)
Spinel
Spinel (G)
Spodumene
Staurolite
Stibiotantalite
Stichtite
Stolzite
Strontianite
Sturmanite
Sugilite
Sulfur
Taaffeite
Talc
(= soapstone
= steatite)
Tantalite
Tektite
Tephroite
Thaumasite
Thomsonite
Tinzenite
Topaz
Tourmaline (G)
Tremolite
Triphylite
Tsilaisite
Tugtupite
Turquoise

Ulexite
Uvarovite
Uvite

Vanadinite
Variscite
Väyrenenite
Vesuvianite
Villiaumite
Vivianite

Wardite
Wavellite
Weloganite
Whewhellite
Wilkeite
Willemite
Witherite
Wollastonite
Wulfenite

Xonotlite

Yugawaralite

Zektzerite
Zincite
Zircon
Zoisite
Zunyite

Mineral Groups of Gemological Interest

(NOTE: only species of gemological interest have been listed)

AMBLYGONITE GROUP
Amblygonite Montebrasite Natromontebrasite

AMPHIBOLE GROUP
Actinolite Hornblende Tremolite
Ferroactinolite Pargasite

APATITE GROUP
Carbonate-hydroxylapatite Carbonate-fluorapatite
Fluorapatite Mimetite Pyromorphite
Vanadinite

ARAGONITE GROUP
Aragonite Cerussite Strontianite Witherite

BARITE GROUP
Barite Anglesite Celestite

CALCITE GROUP
Calcite Magnesite Rhodochrosite Siderite
Smithsonite

EPIDOTE GROUP
Allanite Clinozoisite Epidote Hancockite
Piedmontite Zoisite

FELDSPAR GROUP
Albite Oligoclase Andesine Labradorite
Bytownite Anorthite Anorthoclase Celsian
Hyalophane Microcline Orthoclase

GARNET GROUP
Almandine Andradite Grossular
Hydrogrossular Kimzeyite Goldmanite
Pyrope Schorlomite Spessartine Uvarovite
Knorringite Yamatoite

HUMITE GROUP
Chondrodite Clinohumite Humite
Norbergite

OLIVINE GROUP
Fayalite Forsterite Tephroite

OSUMILITE GROUP
Milarite Osumilite Sogdianite Sugilite

PYROXENE GROUP
Acmite Augite Clinoenstatite
Clinohypersthene Diopside Enstatite
Hypersthene Jadeite Spodumene

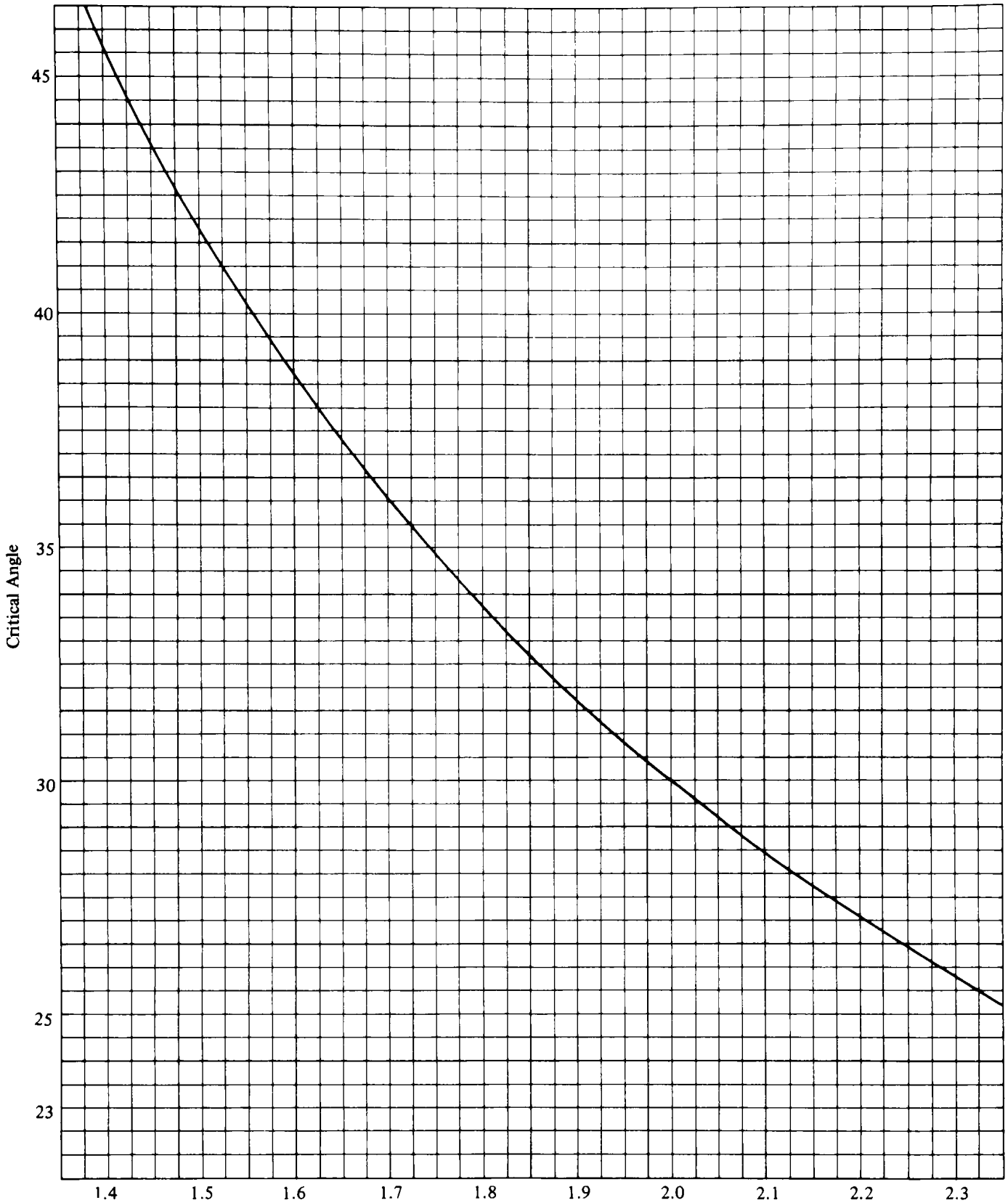
RUTILE GROUP
Cassiterite Rutile

SODALITE GROUP
Hauyne Lazurite Nosean Sodalite

SPINEL GROUP
Chromite Franklinite Gahnite Galaxite
Hercynite Magnesiochromite Magnetite
Spinel

TOURMALINE GROUP
Buergerite Dravite Uvite Elbaite
Schorl Liddicoatite Ferridravite
Chromdravite Tsilaisite

ZEOLITE GROUP
Analcime Chabazite Gmelinite Heulandite
Mesolite Natrolite Pollucite Scolecite
Stilbite Thomsonite Yugawaralite



Graph of index of refraction plotted against critical angle, as determined by the formula: Critical angle = arcsin (1/*n*) where *n* is the refractive index. This graph is most useful to the gem cutter for determining main pavilion angles. Maximum brilliance is achieved when the pavilion main angle is slightly greater than the critical angle. This can be determined for any given gem material with a quick refractive index measurement on a polished surface prior to cutting the pavilion.

PERIODIC CLASSIFICATION OF THE ELEMENTS

IA	II A	III B	IV B	V B	VI B	VII B	VIII B		I B	II B	III A	IV A	V A	VI A	VII A	0
1 H Hydrogen 1.0079																2 He Helium 4.00260
3 Li Lithium 6.941	4 Be Beryllium 9.01218										5 B Boron 10.81	6 C Carbon 12.011	7 N Nitrogen 14.0067	8 O Oxygen 15.9994	9 F Fluorine 18.99840	10 Ne Neon 20.179
11 Na Sodium 22.98977	12 Mg Magnesium 24.305										13 Al Aluminum 26.98154	14 Si Silicon 28.086	15 P Phosphorus 30.97376	16 S Sulfur 32.06	17 Cl Chlorine 35.453	18 Ar Argon 39.948
19 K Potassium 39.098	20 Ca Calcium 40.08	21 Sc Scandium 44.9559	22 Ti Titanium 47.90	23 V Vanadium 50.9414	24 Cr Chromium 51.996	25 Mn Manganese 54.9380	26 Fe Iron 55.847	27 Co Cobalt 58.9332	28 Ni Nickel 58.71	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.72	32 Ge Germanium 72.59	33 As Arsenic 74.9216	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.80
37 Rb Rubidium 85.4678	38 Sr Strontium 87.62	39 Y Yttrium 88.9059	40 Zr Zirconium 91.22	41 Nb Niobium 92.9064	42 Mo Molybdenum 95.94	43 Tc Technetium 98.9062[b]	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.9055	46 Pd Palladium 106.4	47 Ag Silver 107.868	48 Cd Cadmium 112.40	49 In Indium 114.82	50 Sn Tin 118.69	51 Sb Antimony 121.75	52 Te Tellurium 127.60	53 I Iodine 126.9045	54 Xe Xenon 131.30
55 Cs Cesium 132.9054	56 Ba Barium 137.34	57* La Lanthanum 138.9055	72 Hf Hafnium 178.49	73 Ta Tantalum 180.9479	74 W Tungsten 183.85	75 Re Rhenium 186.2	76 Os Osmium 190.2	77 Ir Iridium 192.22	78 Pt Platinum 195.09	79 Au Gold 196.9665	80 Hg Mercury 200.59	81 Tl Thallium 204.37	82 Pb Lead 207.2	83 Bi Bismuth 208.9804	84 Po Polonium (210)[a]	85 At Astatine (210)[a]	86 Rn Radon (222)[a]
87 Fr Francium (223)[a]	88 Ra Radium 226.0254[b]	89** Ac Actinium (227)[a]	104 (260)[a]	105 (260)[a]	106 (263)*												

metals ← → nonmetals

58 Ce Cerium 140.12	59 Pr Praseo-dymium 140.9077	60 Nd Neodymium 144.24	61 Pm Promethium (145)[a]	62 Sm Samarium 150.4	63 Eu Europium 151.96	64 Gd Gadolinium 157.25	65 Tb Terbium 158.9254	66 Dy Dysprosium 162.50	67 Ho Holmium 164.9304	68 Er Erbium 167.26	69 Tm Thulium 168.9342	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.97
90 Th Thorium 232.0381[b]	91 Pa Protactnium 231.0359[b]	92 U Uranium 238.029	93 Np Neptunium 237.0482[b]	94 Pu Plutonium (242)[a]	95 Am Americium (243)[a]	96 Cm Curium (247)[a]	97 Bk Berkelium (249)[a]	98 Cf Californium (251)[a]	99 Es Einsteinium (254)[a]	100 Fm Fermium (253)[a]	101 Md Mendelevium (256)[a]	102 No Nobelium (254)[a]	103 Lr Lawrencium (257)[a]

[a] Mass number of most stable or best known isotope.

[b] Mass of most commonly available, long-lived isotope.