

Thin Film Evaporation Material Source Reference

| Name | Symbol | Melting Point (°C) | Density (g/cm3) | Temp (°C) at Vap. Press. | | | Evaporation Techniques | | | | Remarks (n = index of refraction) |
|--------------------------|---------------------------------|--------------------|-----------------|--------------------------|-----------------------|-----------------------|------------------------|--|----------|--|--|
| | | | | 10 ⁻⁸ Torr | 10 ⁻⁶ Torr | 10 ⁻⁴ Torr | Electron Beam | Crucible | Coil | Boat | |
| Aluminum | Al | 660 | 2.7 | 677 | 821 | 1010 | XInt. | TiB ₂ -BN ZrB ₂ BN | W | TiB ₂ W | Alloys and wets; tungsten-stranded superior |
| Aluminum Antimonide | AlSb | 1080 | 4.3 | | | | | | | | |
| Aluminum Arsenide | AlAs | 1600 | 3.7 | | | ~1300 | | | | | |
| Aluminum Bromide | AlBr ₃ | 97 | 3.01 | | | ~50 | | Graphite | | Mo | |
| Aluminum Carbide | Al ₄ C ₃ | 1400 | 2.36 | | | ~800 | Fair | | | | n=2.7 |
| Aluminum 2% Copper | Al2%Cu | 640 | 2.82 | | | | | | | | Wire feed and flash. Difficult from dual sources. |
| Aluminum Fluoride | AlF ₃ | 1257 Subl. | 3.07 | 410 Subl. | 490 Subl. | 700 Subl. | Poor | Graphite | | Mo, W | n=1.38 at 0.55μ |
| Aluminum Nitride | AlN | Subl. | 3.26 | | | ~1750 | Fair | | | | Decomposes. Reactice evaporate in 10 ⁻³ N ₂ with glow discharge. |
| Aluminum Oxide (alumina) | Al ₂ O ₃ | 2045 | 3.97 | | | 1550 | XInt. | | | W | Sapphire xInt in EB, forms smooth hard films. N=1.66 |
| Alumnum 2% Silicon | Al2%Si | 640 | 2.69 | | | 1010 | | TiB ₂ -BN | | | Wire feed and flash. Difficult from dual sources. |
| Antimony | Sb | 630 | 6.68 | 279 Subl. | 345 Subl. | 425 Subl. | Poor | BN C Al ₂ O ₃ | Mo Ta | Mo Ta Al ₂ O ₃ Coated | Toxic. Evaporates well. Film structure is rate-dependent. |
| Antimony Telluride | Sb ₂ Te ₃ | 619 | 6.5 | | | 600 | | Carbon | | | Decomposes over 750 degrees C. |
| Antimony Trioxide | Sb ₂ O ₃ | 656 | 5.2 or 5.76 | Subl. | Subl. | ~300 Subl. | Good | BN Al ₂ O ₃ | | Pt | Toxic. Decomposes on W. n=2.05 |
| Antimony Triselenide | Sb ₂ Se ₃ | 611 | | | | | | Carbon | | Ta | Stoichiometry variable. |

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| Antimony Trisulphide | Sb ₂ S ₃ | 550 | 4.64 | | | ~200 | Good | Al ₂ O ₃ | | Mo Ta | n=3.01 at 0.55μ. No decomposition. |
| Arsenic | As | 814 | 5.73 | 107 Subl. | 150 Subl. | 210 Subl. | Poor | Al ₂ O ₃ BeO Vit. Carbon | | C | Toxic. Sublimes rapidly at low temperature. |
| Arsenic Selenide | As ₂ Se ₃ | 360 | 4.75 | | | | | Al ₂ O ₃ Quartz | | | n=2.41 at 3.8μ. |
| Arsenic Trisulphide | As ₂ S ₃ | 300 | 3.43 | | | ~400 | Fair | Al ₂ O ₃ Quartz | | Mo | n=2.8 |
| Arsenic Telluride | As ₂ Te ₃ | 362 | | | | | | | | Flash | |
| Barium | Ba | 710 | 3.78 | 545 | 627 | 735 | Fair | Metals | W | W Ta Mo | Wets w/o alloying - reacts with ceramics |
| Barium Chloride | BaCl ₂ | 962 | 3.86 | | | ~650 | | | | Ta, Mo | Use gentle preheat to outgas |
| Barium Fluoride | BaF ₂ | 1280 | 4.83 | Subl. | Subl. | ~700 Subl. | Good | | | Mo | n=1.29 at 5μ. Density Rate Dependent. |
| Barium Oxide | BaO | 1923 | 5.72 or 5.32 | | | ~1300 | Poor | Al ₂ O ₃ | | Pt | Decomposes slightly. n=1.98 |
| Barium Sulphide | BaS | 2200 | 4.25 | | | 1100 | | | | Mo | n=2.16 |
| Barium Titanate | BaTiO ₃ | Dec- omposes | 6 | Dec. | Dec. | Dec. | | | | | Decomposes, yields free Ba from single source; sputtering preferred; or co-evaporate from 2 sources |
| Beryllium | Be | 1278 | 1.85 | 710 | 878 | 1000 | XInt. | BeO C Vit. Carbon | W | W Ta | Wets W/Mo/Ta. Metal powder and oxides are toxic. Evaporates easily. |
| Beryllium Chloride | BeCl ₂ | 440 | 1.9 | | | ~150 | | | | | |
| Beryllium Fluoride | BeF ₂ | 800 | 1.99 | Subl. | Subl. | ~200 Subl. | Good | | | | Toxic. |
| Beryllium Oxide | BeO | 2530 | 3.01 | | | 1900 | Good | | | | Powders toxic. No decomposition from EB guns. n=1.72 |
| Bismuth | Bi | 271 | 9.8 | 330 | 410 | 520 | XInt. | Al ₂ O ₃ Vit. Carbon | W | W Mo Al ₂ O ₃ Ta | Vapors are toxic. High Resistivity. No shorting of baskets. |
| Bismuth Fluoride | BiF ₃ | 727 | 8.75 | Subl. | Subl. | ~300 Subl. | | Graphite | | | n=1.74 at 1μ. 1.64 at 10μ |

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| Bismuth Oxide | Bi ₂ O ₃ | 820 | 8.9 | | | ~1400 | Poor | | | Pt | Vapors are toxic. n=2.55 |
| Bismuth Selenide | Bi ₂ Se ₃ | 710 | 7.66 | | | ~650 | Good | Graphite Quartz | | | Sputtering preferred; or co-evaporate from 2 sources. |
| Bismuth Telluride | Bi ₂ Te ₃ | 585 | 7.85 | | | ~600 | | Graphite Quartz | | W Mo | Sputtering preferred; or co-evaporate from 2 sources. |
| Bismuth Titanate | Bi ₂ Ti ₂ O ₇ | | | Dec. | Dec. | Dec. | | | | | Decomposes. Sputtering preferred; or co-evaporate from 2 sources in 10-2O ₂ |
| Bismuth Trisulphide | Bi ₂ S ₃ | 685 | 7.39 | | | | | | | | n = 1.5 (approx.) |
| Boron | B | 2100 | 2.36 | 1278 Subl. | 1548 Subl. | 1797 Subl. | XInt. | C Vit. Carbon | | C | Material explodes with rapid cooling. Forms carbide with container. |
| Boron Carbide | B ₄ C | 2350 | 2.5 | 2500 | 2580 | 2650 | XInt. | | | | Similar to chromium. |
| Boron Nitride | BN | 2300 | 2.2 | Subl. | Subl. | ~1600 Subl. | Poor | | | | Sputtering preferred; Decomposes. |
| Boron Oxide | B ₂ O ₃ | 460 | 1.82 | | | ~1400 | Good | | | Pt Mo | n=1.46 |
| Boron Trisulphide | B ₂ S ₃ | 310 | 1.55 | | | 800 | | Graphite | | | |
| Cadmium | Cd | 321 | 8.64 | 64 | 120 | 180 | Poor | Al ₂ O ₃ Quartz | | W Cb Mo Ta | Poisons vacuum systems, low sticking coefficient |
| Cadmium Antimonide | CdSb | 456 | 6.92 | | | | | | | | |
| Cadmium Arsenide | Cd ₃ As ₂ | 721 | 6.21 | | | | | Quartz | | | |
| Cadmium Bromide | CdBr ₂ | 567 | 5.19 | | | ~300 | | | | | |
| Cadmium Chloride | CdCl ₂ | 570 | 4.05 | | | ~400 | | | | | |
| Cadmium Fluoride | CdF ₂ | 1070 | 6.64 | | | ~500 | | | | | n=1.56 |
| Cadmium Iodide | CdI ₂ | 400 | 5.3 | | | ~250 | | | | | |
| Cadmium Oxide | CdO | 900 | 6.95 | | | ~530 | | | | | Disproportionates. n=2.49 |
| Cadmium Selenide | CdSe | 1264 | 5.81 | Subl. | Subl. | 540 Subl. | Good | Al ₂ O ₃ Quartz | | Mo Ta | Evaporates easily. n=2.4 at 0.6μ |

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| Cadmium Silicide | CdSiO ₂ | | | | | ~600 | | | | | | n=1.69 |
| Cadmium Sulphide | CdS | 1750 | 4.82 | Subl. | Subl. | 550 Subl. | Fair | Al ₂ O ₃ Quartz | | W Mo Ta | | Sticking coefficient strongly affected by substrate temperature. n=2.4, JVST 12, 188 (1975) |
| Cadmium Telluride | CdTe | 1098 | 6.2 | | | 450 | | | W | W Mo Ta | | Stoichiometry depends on substrate temperature. n=2.6 |
| Calcium | Ca | 842 | 1.55 | 272 Subl. | 357 Subl. | 459 Subl. | Poor | Al ₂ O ₃ Quartz | W | W | | Corrodes in air. |
| Calcium Fluoride | CaF ₂ | 1360 | 3.18 | | | ~1100 | Xint. | Quartz | W Mo Ta | W Mo Ta | | Rate control important. Use gentle preheat to outgas. n=1.2 - 1.4 |
| Calcium Oxide | CaO | 2580 | 3.35 | | | ~1700 | | ZrO ₂ | | W Mo | | Forms volatile oxides with W and Mo. n=1.84 |
| Calcium Silicate | CaO-SiO ₂ | 1540 | 2.9 | | | | Good | Quartz | | | | n=1.61 |
| Calcium Sulphide | CaS | Subl. | 2.18 | | | 1100 | | | | Mo | | Decomposes. n=2.14 |
| Calcium Titanate | CaTiO ₃ | 1975 | 4.1 | 1490 | 1600 | 1690 | Poor | | | | | Disproportionates except in sputtering. |
| Calcium Tungstate | CaWO ₄ | 1620 | 6.06 | | | | Good | | | W | | n=1.92 |
| Carbon | C | Subl. | 1.8 - 2.3 | 1657 Subl. | 1867 Subl. | 2137 Subl. | Xint. | | | | | EB preferred. Arc evaporation. Poor film adhesion. Vitreous carbon n=1.47 |
| Cerium | Ce | 795 | 8.23 | 970 | 1150 | 1380 | Good | Al ₂ O ₃ BeO Vit. Carbon | W | W Ta | | Films oxidize easily. |
| Ceric Oxide | CeO ₂ | 2600 | 7.3 | 1890 Subl. | 2000 Subl. | 2310 Subl. | Good | | | W | | Use 250-300 °C substrate temperature. n=2.2-2.4. Reacts with W. |
| Cerium Fluoride | CeF ₃ | 1418 | 6.16 | | | ~900 | Good | | | W Mo Ta | | Use gentle preheat to outgas. n=1.63 at 0.55μ |
| Cerium Oxide | Ce ₂ O ₃ | 1692 | 6.87 | | | | Fair | | | W | | Alloys with source; use 0.015-0.020 W boat. n=1.95 |
| Cesium | Cs | 28 | 1.87 | -16 | 22 | 30 | | Quartz | | S.S. | | |
| Cesium Bromide | CsBr | 636 | 4.44 | | | ~400 | | | | W | | n=1.70 |
| Cesium Chloride | CsCl | 646 | 3.97 | | | ~500 | | | | W | | n=1.64 Hygroscopic |
| Cesium Fluoride | CsF | 684 | 3.59 | | | ~500 | | | | W | | |

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| Cesium Hydroxide | CsOH | 272 | 3.67 | | | 550 | | | | Pt | | |
| Cesium Iodide | CsI | 621 | 4.51 | | | ~500 | | Pt Quartz | | W Pt | n=1.79 | |
| Chiolote | Na ₅ Al ₃ F ₁₄ | | 2.9 | | | ~800 | | | | Mo W | n=1.33 | |
| Chromium | Cr | 1890 | 7.2 | 837 Subl. | 977 Subl. | 1157 Subl. | Good | Vit. Carbon | W | Cr-plated rod or strip | Films very adherent. High rates possible. | |
| Chromium Boride | CrB | 2760 | 6.17 | | | | | | | | | |
| Chromium Bromide | CrB ₂ | 842 | 4.36 | | | 550 | | | | Inconel | | |
| Chromium Carbide | Cr ₃ C ₂ | 1890 | 6.68 | | | ~2000 | Fair | | | W | | |
| Chromium Chloride | CrCl ₂ | 824 | 2.75 | | | 550 | | | | Fe Inconel | Sublimes easily. | |
| Chromium Oxide | Cr ₂ O ₃ | 2435 | 5.21 | | | ~2000 | Good | | | W, Mo | Disproportionates to lower oxides, reoxidizes at 600 °C in air. n=2.4 | |
| Chromium Silicide | Cr ₃ Si | 1710 | 6.51 | | | | | | | | | |
| Chromium Silicon Monoxide | Cr-SiO | Influenced by composition... | | | | | | Good | | | W | Flash. |
| Cobalt | Co | 1495 | 8.9 | 850 | 990 | 1200 | XInt. | Al ₂ O ₃ BeO | | W Cb | Alloys with refractory metals. | |
| Cobalt Bromide | CoBr ₂ | 678 | 4.91 | Subl. | Subl. | 400 Subl. | | | | Inconel | | |
| Cobalt Chloride | CoCl ₂ | 740 | 3.36 | Subl. | Subl. | 472 Subl. | | | | Inconel | | |
| Cobalt Oxide | CoO | 1935 | 5.68 | | | | | | | | Sputtering preferred. | |
| Copper | Cu | 1083 | 8.92 | 727 | 857 | 1017 | XInt. | Al ₂ O ₃ Mo, Ta | W | Mo | Films do not adhere well. Use intermediate layer, e.g. chromium. Evaporates from any source materials. | |
| Copper Chloride | CuCl | 422 | 3.53 | | | ~600 | | | | | n=1.93 | |
| Copper Oxide | Cu ₂ O | 1235 | 6 | Subl. | Subl. | ~600 Subl. | Good | Al ₂ O ₃ | | Ta | Evaporate in 10 ⁻² - 10 ⁻⁴ of O ₂ ; n=2.70 J. Electrochem. Soc. 110, 119 (1967) | |
| Copper Sulphide | CuS | 1113 | 6.75 | Subl. | Subl. | ~500 Subl. | | | | | n=1.45 | |
| Cryolite | Na ₃ AlF ₆ | 1000 | 2.9 | 1020 | 1260 | 1480 | XInt. | Vit. Carbon | | W, Mo, Ta | Large chunks reduce spitting. Little decomposition. n=2.34 at 6330A. | |

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| Dysprosium | Dy | 1409 | 8.54 | 625 | 750 | 900 | Good | | | Ta | |
| Dysprosium Fluoride | DyF ₃ | 1360 | | Subl. | Subl. | ~800 Subl. | Good | | | Ta | |
| Dysprosium Oxide | Dy ₂ O ₃ | 2340 | 7.81 | | | ~1400 | | | | Ir | Loses oxygen. |
| Erbium | Er | 1497 | 9.06 | 650 Subl. | 775 Subl. | 930 Subl. | Good | | | W, Ta | |
| Erbium Fluoride | ErF ₃ | 1350 | 7.81 | | | ~750 | | | | Mo | |
| Erbium Oxide | Er ₂ O ₃ | 2400 | 8.64 | | | ~1600 | | | | Ir | Loses oxygen. |
| Europium | Eu | 822 | 5.26 | 280 Subl. | 360 Subl. | 480 Subl. | Fair | Al ₂ O ₃ | | W, Ta | Low tantalum solubility. |
| Europium Fluoride | EuF ₂ | 1380 | 6.5 | | | ~950 | | | | Mo | |
| Europium Oxide | Eu ₂ O ₃ | 2056 | 7.42 | | | ~1600 | Good | ThO ₂ | | Ir, Ta, W | Loses oxygen; films clear and hard. |
| Europium Sulphide | EuS | | 5.75 | | | | Good | | | | |
| Gadolinium | Gd | 1312 | 7.89 | 760 | 900 | 1175 | XInt. | Al ₂ O ₃ | | Ta | High Ta solubility. |
| Gadolinium Oxide | Gd ₂ O ₃ | 2310 | 7.41 | | | | Fair | | | Ir | Loses oxygen. n=1.8 at 0.55μ |
| Gallium | Ga | 30 | 5.9 | 619 | 742 | 907 | Good | Al ₂ O ₃ BeO Quartz | | | Alloys with refractory metals. Use EB gun. |
| Gallium Antimonide | GaSb | 710 | 5.6 | | | | Fair | | | W, Ta | Flash evaporate. |
| Gallium Arsenide | GaAs | 1238 | 5.3 | | | | Good | Carbon | | W, Ta | Flash evaporate. n=5.64 at 10.6μ |
| Gallium Nitride | GaN | Subl. | 6.1 | | | ~200 | | Al ₂ O ₃ | | | Evaporate Ga in 10 ⁻³ N ₂ . |
| Gallium Oxide | Ga ₂ O ₃ | 1900 | 5.88 | | | | | | | Pr, W | Loses oxygen. |
| Gallium Phosphide | GaP | 1540 | 4.1 | | 770 | 920 | | Quartz | | W, Ta | Decomposes vapor mostly P. |
| Germanium | Ge | 937 | 5.35 | 812 | 957 | 1167 | XInt. | Quartz Al ₂ O ₃ | | W, C, Ta | Excellent film from EB sources. Use 0.040 W. n=4.01 |
| Germanium Nitride | Ge ₃ N ₂ | 450 | 5.2 | Subl. | Subl. | ~650 Subl. | | | | | Sputtering preferred. |
| Germanium Oxide | GeO ₂ | 1086 | 6.24 | | | ~625 | Good | Quartz Al ₂ O ₃ | | Ta, Mo | Similar to SiO, film predominantly GeO. |

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| Germanium Telluride | GeTe | 725 | 6.2 | | | 381 | | Quartz Al ₂ O ₃ | | W, Mo | |
| Glass, Schott 8329 | | | 2.2 | | | | XInt. | | | | Evaporable alkali glass. Melt in air before evaporating. N=1.47 |
| Gold | Au | 1062 | 19.32 | 807 | 947 | 1132 | XInt. | Al ₂ O ₃ BN Vit. Carbon | W | W, Mo Coated Al ₂ O ₃ | Films soft, not very adherent. |
| Hafnium | Hf | 2230 | 13.09 | 2160 | 2250 | 3090 | Good | | | | |
| Hafnium Boride | HfB ₂ | 3250 | 10.5 | | | | | | | | |
| Hafnium Carbide | HfC | 4160 | 12.2 | Subl. | Subl. | ~2600 Subl. | | | | | |
| Hafnium Nitride | HfN | 2852 | 13.8 | | | | | | | | |
| Hafnium Oxide | HfO ₂ | 2812 | 9.68 | | | ~2500 | Fair | | | W | Film HfO n=2.0 at 0.5μ |
| Hafnium Silicide | HfSi ₂ | 1750 | 7.2 | | | | | | | | |
| Holmium | Ho | 1470 | 8.8 | 650 Subl. | 770 Subl. | 950 Subl. | Good | | W | W, Ta | |
| Holmium Fluoride | HoF ₃ | 1143 | 7.64 | | | ~800 | | Quartz | | | |
| Holmium Oxide | Ho ₂ O ₃ | 2370 | 8.41 | | | | | | | Ir | Loses oxygen. |
| Inconel | Ni/Cr/Fe | 1425 | 8.5 | | | | Good | | W | W | Use fine wire pre-wrapped on W. Low rate req'd for smooth films. |
| Indium | In | 157 | 7.3 | 487 | 597 | 742 | XInt.; Mo Liner req'd | Graphite Al ₂ O ₃ | W | W, Mo | Wets W and Cu; use Mo liner in guns. |
| Indium Antimonide | InSb | 535 | 5.8 | 500 | | ~400 | | | | W | Toxic, Decomposes; sputtering preferred; or co-evaporate from 2 sources; flash. n=4.3 at 1μ |
| Indium Arsenide | InAs | 943 | 5.7 | 780 | 870 | 970 | | | | W | Toxic, Sputtering preferred; or co-evaporate from 2 sources; flash. n=4.5 at 1μ |
| Indium Oxide | In ₂ O ₃ | 1565 | 7.18 | Subl. | Subl. | ~1200 Subl. | Good | Al ₂ O ₃ | | W, Pt | Film In ₂ O; transparent conductor. |
| Indium Phosphide | InP | 1058 | 4.8 | | 630 | 730 | | Graphite | | W, Ta | Deposits P rich. Flash evaporate. |
| Indium Selenide | In ₂ Se ₃ | 890 | 5.7 | | | | | | | | Sputtering preferred; or co-evaporate from 2 sources. Flash. |

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| Indium Sesqui-sulphide | In ₂ S ₃ | 1050 | 4.9 | Subl. | Subl. | 850 Subl. | | Graphite | | | Film In ₂ S |
| Indium Sulphide | In ₂ S | 653 | 5.87 | | | 650 | | Graphite | | | |
| Indium Telluride | In ₂ Te ₃ | 667 | 5.8 | | | | | | | | Sputtering preferred; or co-evaporate from 2 sources; flash. |
| Iridium | Ir | 2459 | 22.65 | 1850 | 2080 | 2380 | Fair | ThO ₂ | | | |
| Iron | Fe | 1535 | 7.86 | 858 | 998 | 1180 | XInt. | Al ₂ O ₃ BeO | W | W | Attacks W. Films hard, smooth. Use gentle preheat to outgas. |
| Iron Bromide | Fe Br ₂ | 689 | 4.64 | | | 561 | | Fe | | | |
| Iron Chloride | FeCl ₂ | 670 | 2.98 | Subl. | Subl. | 300 Subl. | | Fe | | | |
| Iron Iodide | FeI ₂ | 592 | 5.31 | | | 400 | | Fe | | | |
| Iron Oxide | FeO | 1425 | 5.7 | | | | Poor | | | | Decomposes; sputtering preferred. |
| Iron Oxide | Fe ₂ O ₃ | 1565 | 5.24 | | | | Good | | | W | Disproportionates to Fe ₃ O ₄ at 1530 °C, n=3.0 |
| Iron Sulphide | FeS | 1195 | 4.84 | | | | | Al ₂ O ₃ | | | Decomposes. |
| Kanthal | FeCrAl | 1500 | 7.1 | | | ~1150 | | | W | W | |
| Lanthanum | La | 920 | 6.17 | 990 | 1212 | 1388 | XInt. | Al ₂ O ₃ | | W, Ta | Films will burn in air if scraped. |
| Lanthanum Boride | LaB ₆ | 2210 | 2.61 | | | | Good | | | | |
| Lanthanum Bromide | LaBr ₃ | 783 | 5.06 | | | | | | | | n=1.94 Hygroscopic |
| Lanthanum Fluoride | LaF ₃ | 1490 | 6 | Subl. | Subl. | 900 Subl. | Good | | | Ta, Mo | No decomposition. n=1.59 at 0.55μ |
| Lanthanum Oxide | La ₂ O ₃ | 2250 | 5.84 | | | 1400 | Good | | | W, Ta | Loses oxygen. n=1.9 at 0.5μ |
| Lead | Pb | 328 | 11.34 | 342 | 427 | 497 | XInt. | Al ₂ O ₃ Quartz | W | W, Mo | Toxic. Carefully controlled rates req'd for superconductors. |
| Lead Bromide | PbBr ₂ | 373 | 6.66 | | | ~300 | | | | | |
| Lead Chloride | PbCl ₂ | 501 | 5.85 | | | ~325 | | Al ₂ O ₃ | | Pt | Little decomposition. n=2.2 |
| Lead Fluoride | PbF ₂ | 822 | 8.24 | Subl. | Subl. | ~400 Subl. | | BeO | | W, Pt, Mo | Toxic. n=1.75 at 0.3μ |
| Lead Iodide | PbI ₂ | 502 | 6.16 | | | ~500 | | Quartz | | Pt | n=2.7 |
| Lead Oxide | PbO | 890 | 9.53 | | | ~550 | | Quartz Al ₂ O ₃ | | Pt | No decomposition. n=2.55 |
| Lead Stannate | PbSnO ₃ | 1115 | 8.1 | 670 | 780 | 905 | Poor | Al ₂ O ₃ | | Pt | Disproportionates. |

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| Lead Selenide | PbSe | 1065 | 8.1 | Subl. | Subl. | ~500 Subl. | | Graphite Al ₂ O ₃ | | W, Mo | |
| Lead Sulphide | PbS | 1114 | 7.5 | Subl. | Subl. | 550 Subl. | | Quartz Al ₂ O ₃ | | W | Little decomposition. n=3.91 |
| Lead Telluride | PbTe | 917 | 8.16 | 780 | 910 | 1050 | | Al ₂ O ₃ Graphite | | Mo, Pt, Ta | Vapors toxic. Deposits Te rich. Sputtering preferred, or co-evaporate from sources. n=5.6 at 5μ |
| Lead Titanate | PbTiO ₃ | | 7.52 | | | | | | | Ta | |
| Lithium | Li | 179 | 0.53 | 227 | 307 | 407 | Good | Al ₂ O ₃ BeO | | Ta, S.S. | Metal reacts violently in air. |
| Lithium Bromide | LiBr | 547 | 3.46 | | | ~500 | | | | Ni | n=1.78 |
| Lithium Chloride | LiCl | 613 | 2.07 | | | 400 | | | | Ni | Use gentle preheat for outgas. n=1.66 |
| Lithium Fluoride | LiF | 870 | 2.6 | 875 | 1020 | 1180 | Good | Al ₂ O ₃ | | Ni, Ta, Mo, W | Rate control important for optical films. Use gentle preheat for outgas. n=1.36 |
| Lithium Iodide | LiI | 446 | 4.06 | | | 400 | | | | Mo, W | |
| Lithium Oxide | Li ₂ O | 1427 | 2.01 | | | 850 | | | | Pt, Ir | n=1.64 |
| Lutetium | Lu | 1652 | 9.84 | | | 1300 | XInt. | Al ₂ O ₃ | | Ta | |
| Lutetium Oxide | Lu ₂ O ₃ | 2489 | 9.41 | | | 1400 | | | | Ir | Decomposes. |
| Magnesium | Mg | 651 | 1.74 | 185 Subl. | 247 Subl. | 327 Subl. | Good | Al ₂ O ₃ Vit. Carbon | W | W, Mo Ta, Cb | Extremely high rates possible. |
| Magnesium Aluminate | MgAl ₂ O ₄ | 2135 | 3.6 | | | | Good | | | | Natural spinel. |
| Magnesium Bromide | MgBr ₂ | 700 | 3.72 | | | ~450 | | | | Ni | Decomposes. |
| Magnesium Chloride | MgCl ₂ | 708 | 2.32 | | | 400 | | | | Ni | Decomposes. n=1.6 |
| Magnesium Fluoride | MgF ₂ | 1266 | 2.9-3.2 | | | 1000 | XInt. | Al ₂ O ₃ | | Mo, Ta | Rate control and substrate heat important for optical films. n=1.38 |
| Magnesium Iodide | MgI ₂ | 700 | 4.24 | | | 200 | | | | Ir | |
| Magnesium Oxide | MgO | 2800 | 3.58 | | | 1300 | Good | Carbon Al ₂ O ₃ | | | W produces volatile oxides. n=1.7. |
| Manganese | Mn | 1244 | 7.2 | 507 Subl. | 572 Subl. | 647 Subl. | Good | Al ₂ O ₃ BeO | W | W, Ta, Mo | |
| Manganese Bromide | MnBr ₂ | 695 | 4.38 | | | 500 | | | | Inconel | |

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|--------------------------|--------------------------------|---------|-------|------|------|------|-------|---|---|--------|--|
| Niobium Carbide | NbC | 3800 | 7.82 | | | | Fair | | | | |
| Niobium Nitride | NbN | 2573 | 8.4 | | | | | | | | Reactive, evaporate Nb in 10 ⁻³ N ₂ . |
| Niobium Oxide | NbO | | 6.27 | | | 1100 | | | | Pt | |
| Niobium Pentoxide | Nb ₂ O ₅ | 1530 | 4.47 | | | | | | | W | n=2.3 |
| Niobium Telluride | NbTe _x | | 7.6 | | | | | | | | Composition variable. |
| Niobium-Tin | Nb ₃ Sn | | | | | | XInt. | | | | Co-evaporate from 2 sources. |
| Niobium Trioxide | Nb ₂ O ₃ | 1780 | 7.5 | | | | | | | W | |
| Osmium | Os | 1700 | 22.5 | 2170 | 2340 | 2760 | Fair | | | | |
| Palladium | Pd | 1550 | 12.4 | 842 | 992 | 1192 | XInt. | Al ₂ O ₃ BeO | W | W | Alloys with refractory metals; rapid evaporation suggested. Spits in EB. |
| Palladium Oxide | PdO | 870 | 8.31 | | | 575 | | Al ₂ O ₃ | | | Decomposes. |
| Parylene (Union Carbide) | C ₈ H ₈ | 300-400 | 1.1 | | | | | | | | Vapor depositable plastic |
| Permalloy | Ni/Fe | 1395 | 8.7 | 947 | 1047 | 1307 | Good | Al ₂ O ₃ Vit. Carbon | | W | Film low in Ni content. Use 84% Ni source. |
| Phosphorus | P | 41.4 | 1.82 | 327 | 361 | 402 | | Al ₂ O ₃ | | | Metal reacts violently in air. |
| Platinum | Pt | 1769 | 21.45 | 1292 | 1492 | 1747 | XInt. | C, ThO ₂ | W | W | Alloys with metals. Films soft, poor adhesion. |
| Plutonium | Pu | 635 | 19 | | | | | | | W | Toxic, radioactive. |
| Polonium | Po | 254 | 9.4 | 117 | 170 | 244 | | Quartz | | | Radioactive |
| Potassium | K | 64 | 0.86 | 23 | 60 | 125 | | Quartz | | Mo | Metal reacts violently in air. Use gentle preheat to outgas. |
| Potassium Bromide | KBr | 730 | 2.75 | | | ~450 | | Quartz | | Ta, Mo | Use gentle preheat to outgas. n=1.56 |
| Potassium Chloride | KCl | 776 | 1.98 | | | 510 | Good | | | Ta, Ni | Use gentle preheat to outgas. n=1.49 |
| Potassium Fluoride | KF | 880 | 2.48 | | | ~500 | Poor | Quartz | | | Use gentle preheat to outgas. n=1.35 |
| Potassium Hydroxide | KOH | 360 | 2.04 | | | ~400 | | | | Pt | Use gentle preheat to outgas. |
| Potassium Iodide | KI | 723 | 3.13 | | | ~500 | | | | Ta | Use gentle preheat to outgas. n=1.68 |
| Praseodymium | Pr | 931 | 6.78 | 800 | 950 | 1150 | Good | | | Ta | |

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|--------------------|--------------------------------|-----------|---------|-------|-------|-----------|-------|---|---------|---------|--|
| Praseodymium Oxide | Pr ₂ O ₃ | 2125 | 6.88 | | | 1400 | Good | ThO ₂ | | Ir | Loses oxygen. n=2.0 |
| Radium | Ra | 700 | 5 | 246 | 320 | 416 | | | | | |
| Rhenium | Re | 3180 | 20.53 | 1928 | 2207 | 2571 | Poor | | | | Fine wire will self-evaporate. |
| Rhenium Oxide | Re ₂ O ₇ | 297 | 8.2 | | | ~100 | | | | | |
| Rhodium | Rh | 1966 | 12.41 | 1277 | 1472 | 1707 | Good | ThO ₂ Vit. Carbon | W | W | EB gun preferred. |
| Rubidium | Rb | 38.5 | 1.47 | -3 | 37 | 111 | | Quartz | | | |
| Rubidium Chloride | RbCl | 715 | 2.76 | | | ~550 | | Quartz | | | n=1.49 |
| Rubidium Iodide | RbI | 642 | 3.55 | | | ~400 | | Quartz | | | |
| Ruthenium | Ru | 2700 | 12.45 | 1780 | 1990 | 2260 | Poor | | | W | Spits violently in EB. Requires degas. |
| Samarium | Sm | 1072 | 7.54 | 373 | 460 | 573 | Good | Al ₂ O ₃ | | Ta | |
| Samarium Oxide | Sm ₂ O ₃ | 2350 | 7.43 | | | | Good | ThO ₂ | | Ir | Loses O ₂ . Films smooth, clear. |
| Samarium Sulphide | Sm ₂ S ₃ | 1900 | 5.72 | | | | Good | | | | |
| Scandium | Sc | 1539 | 2.99 | 714 | 837 | 1002 | XInt. | Al ₂ O ₃ BeO | | W | Alloys with Ta |
| Scandium Oxide | Sc ₂ O ₃ | 2300 | 3.86 | | | ~400 | Fair | | | | Loses oxygen. n=1.88 at 0.5μ |
| Selenium | Se | 217 | 4.79 | 89 | 125 | 170 | Good | Al ₂ O ₃ Vit. Carbon | W Mo | W, Mo | Toxic. Poisons vacuum systems. |
| Silicon | Si | 1410 | 2.42 | 992 | 1147 | 1337 | Fair | BeO Ta Vit. Carbon | | W Ta | Alloys with W; use heavy W boat. SiO produced above 4 x 10 ⁻⁶ Torr. EB best. n=3.42 |
| Silicon Boride | SiB ₆ | | 2.47 | | | | Poor | | | | |
| Silicon Carbide | SiC | 2700 | 3.22 | | | 1000 | | | | | Sputtering preferred. |
| Silicon Dioxide | SiO ₂ | 1610-1710 | 2.2-2.7 | | | ~1025 | XInt. | Al ₂ O ₃ | | | Quartz excellent in EB. n=1.47 |
| Silicon Monoxide | SiO | 1702 | 2.1 | Subl. | Subl. | 850 Subl. | Fair | Ta | W | Ta | Baffle box source best for resistance evaporation. Low rate suggested. n=1.6 |
| Silicon Nitride | Si ₃ N ₄ | Subl. | 3.44 | | | ~800 | | | | | n=2.1 |
| Silicon Selenide | SiSe | | | | | 550 | | Quartz | | | |

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|--------------------|---|---------------|-------|-------|-------|---------------|-------|--------------------------------------|---|-----------|---|
| Silicon Sulphide | SiS | Subl. | 1.85 | | | 450 | | Quartz | | | |
| Silicon Telluride | SiTe ₂ | | 4.39 | | | 550 | | Quartz | | | |
| Silver | Ag | 961 | 10.49 | 847 | 958 | 1105 | XInt. | Al ₂ O ₃ Mo | W | Ta Mo | Evaporates well from any source. |
| Silver Bromide | AgBr | 432 | 6.47 | | | ~380 | | Quartz | | Ta | n=2.25 |
| Silver Chloride | AgCl | 455 | 5.56 | | | ~520 | | Quartz | | Mo, Pt | n=2.07 |
| Silver Iodide | AgI | 558 | 5.67 | | | ~500 | | | | Ta | n=2.21 |
| Sodium | Na | 97 | 0.97 | 74 | 124 | 192 | | Quartz | | Ta, S.S. | Use gentle preheat to outgas. Metal reacts violently in air. |
| Sodium Bromide | NaBr | 755 | 3.2 | | | ~400 | | Quartz | | | Use gentle preheat to outgas. n=1.64 |
| Sodium Chloride | NaCl | 801 | 2.16 | | | 530 | Good | Quartz | | Ta, W, Mo | Cu ovens, little decomposition. Use gentle preheat to outgas. n=1.54 |
| Sodium Cyanide | NaCN | 563 | | | | ~550 | | | | Ag | Use gentle preheat to outgas. n=1.45 |
| Sodium Fluoride | NaF | 988 | 2.79 | | | ~700 | Good | BeO | | Mo, Ta, W | Use gentle preheat to outgas. No decomposition. n=1.30 at 0.55μ. |
| Sodium Hydroxide | NaOH | 318 | 2.13 | | | ~470 | | | | Pt | Use gentle preheat to outgas. n=1.36 |
| Spinel | MgO ₃ 5Al ₂ O ₃ | | 8 | | | | Good | | | | n=1.72 |
| Strontium | Sr | 769 | 2.6 | 239 | 309 | 403 | Poor | Vit. Carbon | W | W, Ta, Mo | Wets but does not alloy with refractory metals. May react violently in air. |
| Strontium Fluoride | SrF ₂ | 1190 | 4.24 | | | ~1000 | | Al ₂ O ₃ | | | n=1.44 |
| Strontium Oxide | SrO | 2460 | 4.7 | Subl. | Subl. | 1500 Subl. | | Al ₂ O ₃ | | Mo | Reacts with Mo and W; n=1.87 |
| Strontium Sulphide | SrS | Above 2000 | 3.7 | | | | | | | Mo | Decomposes. n=2.11 |
| Sulphur | S ₈ | 115 | 2 | 13 | 19 | 57 | Poor | Quartz | | W | Poisons vacuum system. |
| Supermalloy | Ni/Fe/Mo | 1410 | 8.9 | | | | Good | | | | Sputtering preferred; or co-evaporate from 2 sources, Permalloy and Mo. |
| Tantalum | Ta | 2996 | 16.6 | 1960 | 2240 | 2590 | XInt. | | | | Forms good films. |
| Tantalum Boride | TaB ₂ | 3000 | 12.38 | | | | | | | | |
| Tantalum Carbide | TaC | 3880 | 14.65 | | | ~2500 | | | | | |
| Tantalum Nitride | TaN | 3360 | 16.3 | | | | | | | | Reactive; evaporate Ta in 10 ⁻³ N ₂ . |

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|---------------------|--------------------------------|------|-------|--------------|--------------|---------------|-------|--|---|-----------|---|
| Tantalum Pentoxide | Ta ₂ O ₅ | 1800 | 8.74 | 1550 | 1780 | 1920 | Good | Vit. Carbon | W | Ta | Slight decomposition; evaporate in 10 ⁻³ Torr of O ₂ . n=2.0 at 1.5μ |
| Tantalum Sulphide | TaS ₂ | 1300 | | | | | | | | | |
| Technetium | Tc | 2200 | 11.5 | 1570 | 1800 | 2090 | | | | | |
| Teflon | PTFE | 330 | 2.9 | | | | | | | W | Baffled Source. Film structure doubtful. |
| Tellurium | Te | 452 | 6.25 | 157 | 207 | 277 | Poor | Al ₂ O ₃ Quartz | W | W, Ta | Wets w/o alloying. Toxic. |
| Terbium | Tb | 1357 | 8.27 | 800 | 950 | 1150 | XInt. | Al ₂ O ₃ | | Ta | |
| Terbium Fluoride | TbF ₃ | 1176 | | | | ~800 | | | | | |
| Terbium Oxide | Tb ₂ O ₃ | 2387 | 7.87 | | | 1300 | | | | Ir | Partially decomposes. |
| Terbium Oxide | Tb ₄ O ₇ | | | | | | | | | Ta | Films TbO. |
| Thallium | Tl | 302 | 11.85 | 280 | 360 | 470 | Poor | Al ₂ O ₃ Quartz | | W, Ta | Wets freely, very toxic. |
| Thallium Bromide | TlBr | 480 | 7.56 | Subl. | Subl. | ~250 Subl. | | Quartz | | Ta | Toxic. n=2.3 |
| Thallium Chloride | TlCl | 430 | 7 | Subl. | Subl. | ~150 Subl. | | Quartz | | Ta | Toxic. n=2.25 |
| Thallium Iodide (B) | TlI | 440 | 7.09 | Subl. | Subl. | ~250 Subl. | | Quartz | | | Toxic. n=2.78 |
| Thallium Oxide | Tl ₂ O ₃ | 717 | 9.65 | | | 350 | | | | | Toxic, Goes to Tl ₂ O at 850 °C |
| Thorium | Th | 1875 | 11.7 | 1430 | 1660 | 1925 | XInt. | | W | W, Ta, Mo | Toxic, radioactive. |
| Thorium Bromide | ThBr ₄ | | 5.67 | Subl. | Subl. | Subl. | | | | Mo | Toxic, n=2.47 at 5μ |
| Thorium Carbide | ThC ₂ | 2773 | 8.96 | | | ~2300 | | Carbon | | | Radioactive |
| Thorium Dioxide | ThO ₂ | 3050 | 10.03 | | | ~2100 | Good | | | W | Radioactive. n=1.86 at 2.2 microns |
| Thorium Fluoride | ThF ₄ | 1110 | 6.3 | | | ~750 | Fair | Vit. Carbon | | Mo | Radioactive. n=1.52. Heat substrate to above 150°C. |
| Thorium Oxyfluoride | ThOF ₂ | 900 | 9.1 | | | | | | | Mo, Ta | Radioactive, n=1.52 |
| Thorium Sulphide | ThS ₂ | | 6.8 | | | | | | | | Sputtering preferred; or co-evaporate from 2 sources. |
| Thulium | Tm | 1545 | 9.32 | 461 Subl. | 554 Subl. | 680 Subl. | Good | Al ₂ O ₃ | | Ta | |
| Thulium Oxide | Tm ₂ O ₃ | | 8.9 | | | 1500 | | | | Ir | Decomposes. |

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|---------------------------|--------------------------------|-------|-------|-------|-------|-------------|-------|--|---|-------|--|
| Tin | Sn | 232 | 7.75 | 682 | 807 | 997 | XInt. | Al ₂ O ₃ | W | Mo | Wets Mo; use a Ta liner in EB guns. |
| Tin Oxide | SnO ₂ | 1127 | 6.95 | Subl. | Subl. | ~1000 Subl. | XInt. | Quartz Al ₂ O ₃ | W | W | Films from W oxygen deficient, oxidize in air. n=2.0 |
| Tin Selenide | SnSe | 861 | 6.18 | | | ~400 | Good | Quartz | | | |
| Tin Sulphide | SnS | 882 | 5.08 | | | ~450 | | Quartz | | | |
| Tin Telluride | SnTe | 780 | 6.44 | | | ~450 | | Quartz | | | |
| Titanium | Ti | 1675 | 4.5 | 1067 | 1235 | 1453 | XInt. | TiC | | W | Alloys with refractory metals; evolves gas on first heating. |
| Titanium Boride | TiB ₂ | 2980 | 4.5 | | | | Poor | | | | |
| Titanium Carbide | TiC | 3140 | 4.93 | | | ~2300 | | | | | |
| Titanium Dioxide (rutile) | TiO ₂ | 1640 | 4.29 | | | ~1300 | Fair | | | W, Mo | Evaporate in 10-4 of O ₂ onto 350° substrates. n=2.4 |
| Titanium Monoxide | TiO | 1750 | 4.93 | | | ~1500 | Good | Vit. Carbon | | W, Mo | Use gentle preheat to outgas. Films TiO ₂ if evaporated like TiO ₂ ; n=2.2 |
| Titanium Nitride | TiN | 2930 | 5.43 | | | | Good | | | Mo | Sputtering preferred. Decomposes with thermal evaporation. |
| Titanium Sesquioxide | Ti ₂ O ₃ | 2130 | 4.6 | | | | Good | | | W | Decomposes. |
| Tungsten | W | 3410 | 19.3 | 2117 | 2407 | 2757 | Good | | | | Forms volatile oxides. Films hard & adherent. |
| Tungsten Boride | WB ₂ | 2900 | 12.75 | | | | Poor | | | | |
| Tungsten Carbide | W ₂ C | 2860 | 17.15 | 1480 | 1720 | 2120 | XInt. | | | C | |
| Tungsten Telluride | WTe ₃ | | 9.49 | | | | | Quartz | | | |
| Tungsten Trioxide | WO ₃ | 1473 | 7.16 | Subl. | Subl. | 980 Subl. | Good | | | W, Pt | Use gentle preheat to outgas. W reduces oxide slightly. n=1.68 |
| Uranium | U | 1132 | 19.07 | 1132 | 1327 | 1582 | Good | | W | Mo, W | Films oxidize. |
| Uranium Carbide | UC ₂ | 2260 | 11.28 | | | 2100 | | Carbon | | | Decomposes. |
| Uranium Dioxide | UO ₂ | 2176 | 10.9 | | | | | | | W | Ta causes decomposition |
| Uranium Fluoride | UF ₄ | ~1000 | | | | 300 | | | | Ni | |
| Uranium Oxide | U ₃ O ₈ | Dec | 8.3 | | | | | | | W | Decomposes at 1300°C to UO ₂ |
| Uranium Phosphide | UP ₂ | | 8.57 | | | 1200 | | | | Ta | Decomposes |

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|------------------------|--|------|------|-----------|-----------|-------------|-------|--|---------|-----------|--|
| Uranium Sulphide | U ₂ S ₃ | | | | | 1400 | | | | W | Slight decomposition |
| Vanadium | V | 1890 | 5.96 | 1162 | 1332 | 1547 | XInt. | | | W, Mo | Wets Mo. EB evaporated films preferred. |
| Vanadium Boride | VB ₂ | 2400 | 5.1 | | | | | | | | |
| Vanadium Carbide | VC | 2810 | 5.77 | | | ~1800 | | | | | |
| Vanadium Dioxide | VO ₂ | 1967 | 4.34 | Subl. | Subl. | ~575 Subl. | | | | | Deposit metal in 1 x 10 ⁻³ O ₂ |
| Vanadium Nitride | VN | 2320 | 6.13 | | | | | | | | |
| Vanadium Pentoxide | V ₂ O ₅ | 690 | 3.36 | | | ~500 | | Quartz | | | |
| Vanadium Silicide | VS _{i2} | 1700 | 4.42 | | | | | | | | |
| Ytterbium | Yb | 824 | 6.98 | 520 Subl. | 590 Subl. | 690 Subl. | Good | | | Ta | |
| Ytterbium Fluoride | YbF ₃ | 1157 | 8.17 | | | ~800 | | | | Mo | n=1.57 at 3.8μ |
| Ytterbium Oxide | Yb ₂ O ₃ | 2346 | 9.17 | Subl. | Subl. | ~1500 Subl. | | | | Ir | Loses oxygen. |
| Yttrium | Y | 1509 | 4.48 | 830 | 973 | 1157 | XInt. | Al ₂ O ₃ | W | W, Ta | High Ta solubility. |
| Yttrium Aluminum Oxide | Y ₃ Al ₅ O ₁₂ | 1990 | | | | | Good | | W | | Films not ferroelectric |
| Yttrium Fluoride | YF ₃ | 1387 | 4.01 | | | | | | | | |
| Yttrium Oxide | Y ₂ O ₃ | 2680 | 4.84 | Subl. | Subl. | ~2000 Subl. | Good | C | | W | Loses oxygen, films smooth and clear. n=1.79 at 1μ |
| Zinc | Zn | 419 | 7.14 | 127 | 177 | 250 | XInt. | Al ₂ O ₃ Quartz | W | Mo, W, Ta | Evaporates well under wide range of conditions. |
| Zinc Antimonide | Zn ₃ Sb ₂ | 546 | 6.3 | | | | | | | | |
| Zinc Bromide | ZnBr ₂ | 394 | 4.22 | | | ~300 | | Carbon | | W | Decomposes. |
| Zinc Fluoride | ZnF ₂ | 872 | 4.84 | | | ~800 | | Quartz | | Pt, Ta | |
| Zinc Nitride | Zn ₃ N ₂ | | 6.22 | | | | | | | Mo | Decomposes. |
| Zinc Oxide | ZnO | 1975 | 5.61 | | | ~1800 | Fair | | | | Anneal in air at 450°C to reoxidize; n=2.0 |
| Zinc Selenide | ZnSe | 1526 | 5.42 | | | 660 | | Quartz | W Mo | Ta, W, Mo | Use gentle preheat to outgas. Evaporates well, n=2.6 |

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|-----------------------|--------------------|------|------|-------|-------|---------------|-------|--|--|--------|--|
| Zinc Sulphide | ZnS | 1830 | 4.09 | Subl. | Subl. | ~800 Subl. | Good | | | Ta, Mo | Use gentle preheat to outgas. Films partially decompose. Sticking coefficient varies with substrate temperature. n=2.3 at 0.5μ |
| Zinc Telluride | ZnTe | 1238 | 6.34 | | | ~600 | | | | Mo, Ta | Use gentle preheat to outgas. n=2.85 at 0.5μ |
| Zircon | ZrSiO ₄ | 2550 | 4.56 | | | | | | | | |
| Zirconium | Zr | 1852 | 6.4 | 1477 | 1702 | 1987 | XInt. | | | W | Alloys with W. Films oxidize readily. |
| Zirconium Boride | ZrB ₂ | 3040 | 6.08 | | | | Good | | | | |
| Zirconium Carbide | ZrC | 3540 | 6.73 | | | ~2500 | | | | | |
| Zirconium Nitride | ZrN | 2980 | 7.09 | | | | | | | | Reactively evaporate in 10 ⁻³ N ₂ atmosphere. |
| Zirconium Oxide | ZrO ₂ | 2700 | 5.49 | | | ~2200 | Good | | | W | Films oxygen deficient, clear, and hard. n=2.05 at 0.75μ |
| Zirconium Silicide | ZrSi ₂ | 1700 | 4.88 | | | | | | | | |