Source Materials symbol	Melting Point ℃	Theorectical Density gm/cm3	Deposition Parameters			Physical parameter		Application/(operation) note
			Appx. Evaporation Temp. ℃@10^{-4} Torr	Thermal "Boat"	E-beam /(Thermal) "Crucible"	Transparent region, μm Reflectance@0.667μ	Refractive index wavelength, μm	
Ag	961	10.49	950	W.Ta.Mo. Al2O3	Mo.C	R=96.4%	2.14/4μ 4.6/6μ	Highest reflectance mirrors visible to IR.
Al	660	2.70	1010	BN-TiB2,W	BN-TiB2,C	R=91.2%		Conductive lines. Front surface mirrors, reflectors (alloy and wets W)
AlCu 98/2 wt%	640	2.82						Wire feed & flash. Diffcult from dual sources.
AlF_3	1257 sublimes	2.9	700 sublimes	W.Mo.Ta	X		1.39/vis	Not affected by water. Good mechanical strength
AlN	2200	3.26	1750	(RF sputter)		R=13.4%		Decomposes. Reactive evap in 10^{-3} T N2 with glow discharge.
Al_2O_3	2015	3.96	1325	W	W	0.2-9	1.8/UV 1.63/Vis 1.73/IR	Al mirror protection. UV laser ARC and high reflectors.
AlSiCu 98.5/1/0.5 wt%	640	2.73						
AZOY 2/98 wt%	1975	5.66					1.98/0.44μ 1.90/0.56μ 1.86/0.68μ	Transparent conductive film
Au	1063	19.3	1132	W.Mo	Mo.C	R=95.1%		Contact layer. High reflecting films for front surface mirror in IR laser
B	2180	2.35	1797 sublimes		C			(carbide with crucible, cool slow)
Ba	714	3.58	735	W.Mo. Ta	W			(wets without alloying, reacts with ceramic)
BaF_2	1280	4.89	~700	W.Mo. Ta	W.Mo	0.25-15	1.5/UV 1.47/Vis 1.44/IR	
BN	~3000	2.25	~1600	(RF sputter)				Decomposes when sputtered; Reactive preferred
B2O3	~450	1.81	~1400		Pt.Mo		1.48	
BaO	1923	5.72	~1200	Pt	X(Al2O3)			
$BaTiO_3$	1618	6.02	decomposed	(RF sputter)			2.4/Vis 2.4/IR	Dielectric film. Thin film capacitor.
Be	1278	1.85	1000	W.Mo.Ta	C.(BeO)			(Toxic) Semiconductor junctions.(Wets W.Mo Ta)
Bi_2O_3	820	8.9	~1400	Pt.Mo.	X		1.91/Vis	(Vapor toxic) Beam splitter
Bi_2Te_3	585	7.9	400~800	W.Mo.	-(QZ)			Magneto-optic film.(by co-evaporation)
C	3500	B	2130 sublimes	(Arc/RF sputter)		R=17.1%	2.45/0.44μ 2.42/0.6μ	
Ca	850	1.55	459	W	X(Al2O3,QZ)			Corrodes in air
CaF_2	1403	3.18	120~1000	Mo. Ta. W	-(QZ)	0.15-12	1.4/Vis 1.3/IR	Low index UV-IR. Anti-Reflection Coating on glass
CdS	1477	4.82	~250 sublimes	Mo. W	-(QZ)		2.4-2.8/Vis	(aperture cover required)
CeF_3	1460	6.16	~900	W.Mo.Ta		0.3-11	1.62/0.5 1.5/5-10	(preheat to outgas)
CeO_2	2600	7.13	2310	W			2.1/Vis 2.2/IR	
Cd	321	8.64	180	W.Mo.Ta	(Al2O3)		2.34/1μ	Bad for vacuum systems. Low sticking coeffcient.
CdSe	>1350	5.81	540	Mo.Ta	(Al2O3)		2.54/1μ	Evaporates easily.
CdTe	1121	5.85	450	W.Mo.Ta			2.6	
Co	1492	8.9	1200	W/Al2O3,W	(Al2O3,BeO)	(R=68%)		Ferromagnetic thin film.(alloys with refractories)
CoO	1795	6.45		(RF sputter)				
Cr	1890	7.19	1157 sublimes	W or Cr metallized on W rod	C,W	R=63.6%	2.7-3.2/V	Beam splitting film. Mirrors. Adhesion film on glass for printed circuits.

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Cr_2O_3	2435	5.2	~2000	W	W. Mo	0.6	2.5/Vis 2.4/1.8	hard binding layer. (Decompose to lower oxided, reoxided @600℃)
Cr-SiO				W				Resistor films (by flash evaporation)
Cu	1083	8.93	1017	W. Mo. Ta	Mo,C,BN-TiB2	R=93.8%		IR reflector. Contacts
Fe	1536	7.87	1200	W	(Al2O3,BeO)			Photo mask. (attacks W)
FeO	1369	5.7		(RF sputter)			2.32	
Fe2O3	1565	5.24		W			3.01	Disproportionates to Fe3O4 at 1530℃
Ga	30	5.9	907		(QZ,Al2O3)			(alloys with refractories)
GaAs	1238	5.3		W.Ta		R=28.6/ 5μ	3.3/5μ	
GaN	800 sublimes	6.1	~200		(Al_2O_3)	(R=16%)	2.44/0.5μ 2.40/0.6μ	(evaporate Ga in 10^{-3} N2)
GaP	1540	4.1	920	W Ta	(QZ)	R=29.5%	3.2-3.8/Vis	
Ge	958	5.32	1167	W. Mo. Ta	C.(Al2O3,QZ)		4.4/2μ 4.0/010μ	High index film in IR filters.
GeO_2	1086	G	~625	Mo. Ta. W	(QZ. Al_2O_3)			Dielectric, protective film
Hf	2230	13.28	3090					
HfO2	2812	9.68	~2500	W		0.25	2.09/0.3μ 2.0/0.5μ 1.93/0.7μ	IR mirror overcoat, UV laser multilayers, emitter wire coating. (high damage threshold 0.35μ)
In	156	7.31	742	W. Mo	Ta. Mo(Al_2O_3)			Transistor contacts, Solder joints. (wets W and Cu, Ta or Mo liner
In2O3	850	7.18	~1200	W.Pt	W. (Al2O3)			
InP	1070	4.8	730	W.Ta		R=32.2%	3.5-4.1/Vis	
ITO 90/10 wt%	~1900	7.17		W. Pt		0.4-2	2/Vis	Transparent conductive film.
Ir	2410	22.42	2380	(DC sputter)				
La	920	6.17	1388	Ta	(Al2O3)			(Films burn in air if scrape)
LaB6	2210	2.61		(RF sputter)				
La2O3	2307	6.51	1400	W.Ta	W		1.73	
LaF3	1490	5.94	~900	Mo. Ta	Mo. W	0.25-11	1.64/0.3 1.61/0.4 1.5/3μ	(preheat to outgas)
Li	181	0.53	407	Ta	(Al2O3)	R=90.2%		metal reacts quickly in air
LiF	845	2.6	1180	Ta. Mo. W			1.36/Vis	(preheat to outgas)
LiNbO3	1257	4.64				R=15.5%	2.34/0.5μ 2.30/0.6μ	
Mg	650	1.74	327 sublimes	W. Mo. Ta	(C, Al2O3)	(R=96%)		Diffusion with Bi on glass to form ferromagnetic film.
MgAl2O4	2135	3.6		(RF sputter)			1.72	Natural spinel.
MgF2	1261	3.2	~1300	W. Mo. Ta	Mo	0.15-6	1.42/0.3 1.38/Vis 1.35/IR	ARC multilayers. (reacts with W)
MgO	2852	3.58	~1600	W	C.W		1.73/Vis	Insulator. High Temp. dielectric.
Mn	1245	7.43	647	W.Mo. Ta	-(C,Al2O3)	(R=61%)		Semiconductor contacts. Adhesion film.
Mo	2610	10.22	2100		C or Mo cone	(R=58%)		Semiconductor contacts. Hard, smooth film.
MoS2	1185	4.8	~50	(RF sputter)				

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MoSi2	2050	6.31		W				Decomposes
Na	98	0.97	192	Ta. SS	(QZ)	(R=98%)	0.042	Preheat gently to outgas. Metal reacts
Na_3AlF_6	1000	2.9	900	W.Ta.Mo	W.Mo.C	0.25~14	1.35/0.55	Soft, water reactive
Nb	2468	8.57	2285		W			Anodic film for rectificantion.
NbO		7.3	1100	Pt	(RF sputter)			
Nb2O3	1780	7.5		W	(RF sputter)			
Nb2O5	1520	4.47		W	(RF sputter)		2.4/0.5μ 2.33/0.6μ	
Ni	1453	8.91	1260	W/Al2O3.W	(Al2O3.C.BeO)	R=65.4%		Durable mirrors. Adhesion layer.(alloy with refractories)
NiCr 80/20 wt%	1450	8.4	1250	W.Ta	(Al_2O_3.C.BeO)			Thin film resistor. Good adhesion on non-metals.(alloy with refractories)
NiFe 81/19 wt%	1395	8.7	1307	W	(Al2O3.C)			
Pb	328	11.34	497	W.Ta.Mo	(QZ. Al2O3)			(Toxic,tate control important)
PbF_2	855	8.24	~400	W.Pt.Ta	-(Al_2O_3)		1.98/UV 1.75/Vis 1.7/IR	(Toxic)Dielectric interference filter for UV
PbO	886	9.53	550	Pt	(QZ. Al2O3)		2.6	
PbS	1114	7.5	500	W	W.Mo (QZ.Al2O3)		3.92 4.2-4.04/3.5-10μ	
Pd	1552	12.02	1192	W	(Al2O3.BeO)	R=72.4%		(alloy with refractories,fine wire-rapid evaporation suggested)
Pr_2O_3	2200	7.07	1900	W	W.C.	0.4-3	1.75-1.8/0.4 1.75-1.7/0.5-0.7	wide-band Vis AR coating (Reactive to radio frequency)
Pt	1769	21.45	1747	W	C.(ThO2)	R=68.4%		(alloy with matal liner,fine wire will self evaporate)
Re	3180	21.04	2571					(fine wire will self evaporate)
Rh	1966	12.41	1707	W	C			
Ru	2310	12.3	2260	W				
Sb	631	6.62	425	Ta.Mo	X(Al2O3.BN)			(Toxic)
Sb_2O_3	656	5.67	~300	Pt.Mo	(BN.Al_2O_3)	0.3-10	2.2/0.4 2.1/0.55	(Toxic,gentle heating sublimes)
Sc	1539	3.0	1000	Ta	(Al2O3.BeO)			Neutron filters.(alloy with Ta)
Sc2O3	2485	3.86	2400		C.W	0.25-5	1.95/0.3 1.90/0.4 1.85/0.7	UV ARC 248nm. High damage threshold at 355 nm with MgF2
Se	217	4.79	170	Mo.W	(C,Al2O3)		2.78/Vis	(Toxic) photoconductive and rectifier flim.
Si	1410	2.33	1350	Ta	C.W.(BeO)		3.4/3μ	(SiO produce with W boat alloy)
SiC	2700	3.22	~1000	(RF sputter)		(R=20%)	2.65-2.7	
SiO	1702	2.13	~850 sublimes	Ta. W. Mo	Ta	0.45-7	12.0/0.5 1.91/1	Resistance evaporation. Low tensile stress. (low rate suggest)
SiO2	1710	2.2	~1200	Ta. W.	no liner, C	0.2-7	1.49/UV 1.46/Vis 1.44/IR	Insulating layer.
Si3N4	1900	3044	~880	(RF sputter)		R=11.4%	2.03/0.5μ	
Sn	232	7.29	997	Mo. Ta	Ta (Al2O3)			Cyrogenic switching device. (wets Mo)

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SnO_2	1630	6.95	600 sublimes	W	W (Al_2O_3)		2.0/Vis	Anti-static film. Transparent heating element.
SrF_2	1473	4.24	~1000				1.44/Vis	Transparent film in IR
Ta	2996	16.6	2590		Ta cone	(R=49%)		Film capacitors.
TaN	3360	16.3		(RF sputter)				Evaporate Ta in 10^{-3} Torr N2
Ta_2O_5	1800	8.2	1920	Ta	C. Ta	0.3-10	2.4/0.3 2.09/0.55-2	Film capacitors. Visible filter, Laser ARC, Hard protective films
Tb	1356	8.27	1150	Ta	(Al2O3)			
Te	450	6.24	277	W. Ta. Mo	x(QZ, Al_2O_3)			
Ti	1668	4.51	1453	W. Ta	C	(R=54%)		Adhesion layer for Au. Vacuum getter.
TiO	1750	4.95	~1500	W.Mo	(RF sputter)		2.2	
TiO_2	1850	3.9(a) 4.26(r)	~1300	W. Ta	no liner, Ta	0.45-11	2.81/0.45 2.71/0.5 2.55/0.7 2.45/1-2	(Amorphous below 300℃, anatase and rutile phases above 300℃) Durable multilayer, Protective coating.
Ti2O3	2130	4.6		W	(RF sputter)			
Ti3O5	1750	4.2						
V	1900	6.11	1547	W. Mo		R=53%		(alloy with W, wets Mo)
V2O5	690	3.36	~500		(QZ) (RF sputter)		1.46-1.76	
W	3387	19.3	2757		W cone	R=50.4%	3.3-3.6/Vis	Contacts on semiconductors.
WO3	1473	7.16	1460	W. Pt			1.68/Vis	Shadow casting for electro microscope.
W/Ti 90/10 wt%		14.6	2600					Diffusion barrier films, primarily between interconnects.
WS2	1250	7.5		(RF sputter)				
WSi2	>900	9.4		(RF sputter)				
Y	1522	4.47	1157	W.Ta				
Y3Al5O12	1990	4.55		W	(RF sputter)		1.83/0.6μ	
YF3	1387	4.01					~1.5/Vis	
Y2O3	2410	5.01	~2000	W.Ta	C	0.3-11	1.93/Vis	Hard film, thin film capacitor.
YbF_3	1157	8.17	~800	Mo	(Al_2O_3)	0.25-11	1.45/IR	
Zn	420	7.13	250	W.Ta.Mo	Mo(Al2O3,QZ)			Metallized paper.Capacitor dielectric films
ZnO	1975	5.61	~1800				2.05/0.5μ 2.0/0.6μ	Sensor
ZnS	1700	4.1	800 sublimes partially decompose	Ta.Mo (QZ)	(RF sputter)		2.35/Vis 2.2/IR	Multilayers. High index film used in non-absorbing beam splitters.
ZnSe	1526	5.42	660	Ta.W.Mo	(QZ)		2.5/Vis	
ZnTe	1239	6.34	~600	Ta.MO	(RF sputter)		3.56	Preheat gently to outags
Zr	1852	6.51	1987	W				Interference layers. On W field emitters to alter emission characteristics. (alloy with W)
ZrO2	2700	5.89	~2200	W			2.15/Vis 2.0/IR	Dielectric coating, emitter coating on wire