

さまざまな物質の熱的性質

TABLE 20.1 Tabulation of the Thermal Properties for a Variety of Materials

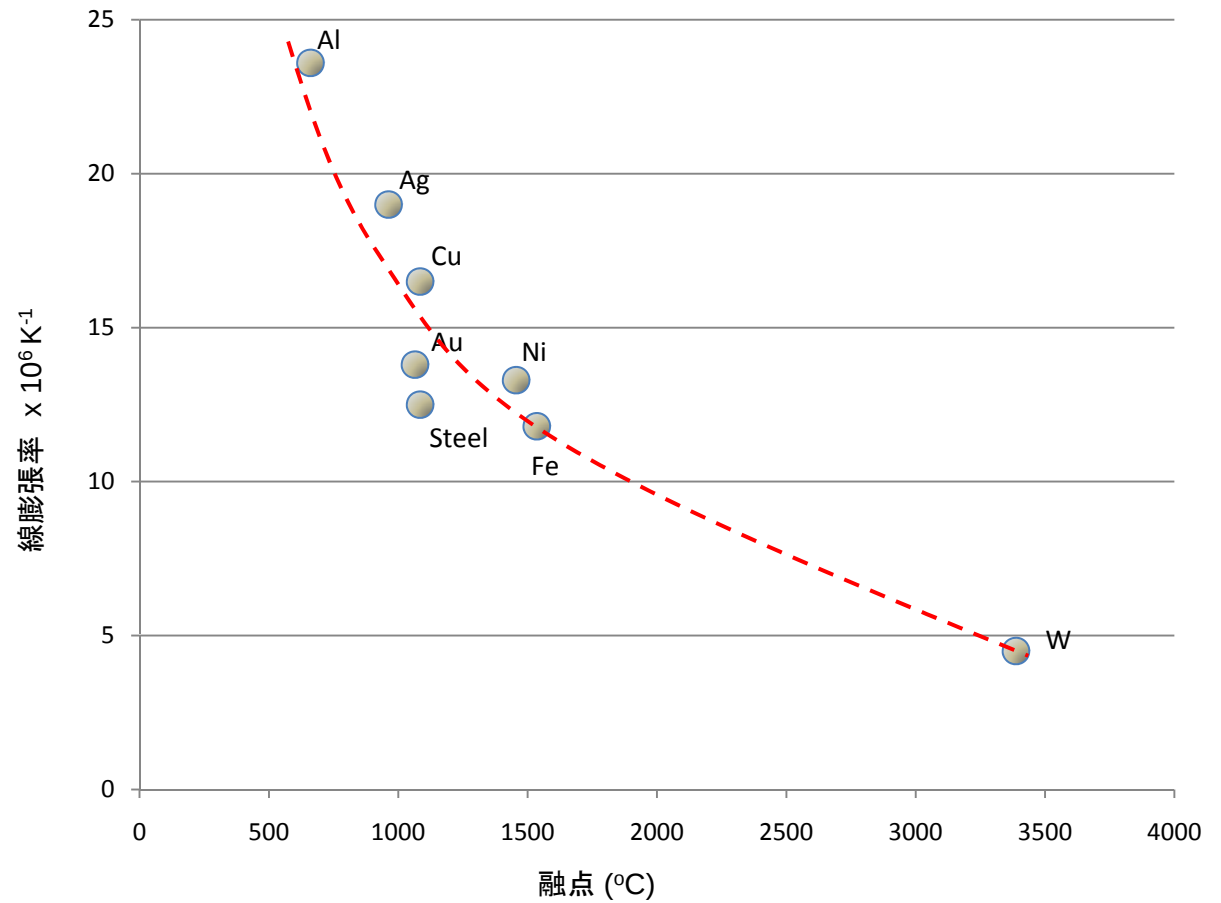
Material	c_p (J/kg-K) ^a	α_l [(°C) ⁻¹ × 10 ⁻⁶] ^b	k (W/m-K) ^c	L [Ω-W/(K) ² × 10 ⁻⁸]
Metals				
Aluminum	900	23.6	247	2.24
Copper	386	16.5	398	2.27
Gold	130	13.8	315	2.52
Iron	448	11.8	80.4	2.66
Nickel	443	13.3	89.9	2.10
Silver	235	19.0	428	2.32
Tungsten	142	4.5	178	3.21
1025 Steel	486	12.5	51.9	—
316 Stainless steel	502	16.0	16.3 ^d	—
Brass (70Cu–30Zn)	375	20.0	120	—
Ceramics				
Alumina (Al ₂ O ₃)	775	8.8	30.1	—
Beryllia (BeO)	1050 ^d	9.0 ^d	220 ^e	—
Magnesia (MgO)	940	13.5 ^d	37.7 ^e	—
Spinel (MgAl ₂ O ₄)	790	7.6 ^d	15.0 ^e	—
Fused silica (SiO ₂)	740	0.5 ^d	2.0 ^e	—
Soda–lime glass	840	9.0 ^d	1.7 ^e	—
Polymers				
Polyethylene	2100	60–220	0.38	—
Polypropylene	1880	80–100	0.12	—
Polystyrene	1360	50–85	0.13	—
Polytetrafluoroethylene (Teflon)	1050	135–150	0.25	—
Phenol-formaldehyde (Bakelite)	1650	68	0.15	—
Nylon 6,6	1670	80–90	0.24	—
Polyisoprene	—	220	0.14	—

炭素繊維の熱伝導率
900 W/(m K)

チャンピオンデータ
1200 W/(m K)

金属の融点と線膨張率の関係

Metal	T _m (°C)	$\alpha_l \times 10^{-6}$ (K ⁻¹)
Al	660	23.6
Cu	1084	16.5
Au	1064	19.8
Fe	1535	11.8
Ni	1455	13.3
Ag	962	19.0
W	3387	4.5
Steel	1084	12.5



W:タングステン

Metals

C_p (J/(kg · K))

		原子量 x kg/mol	25/x J/(kg K)
Aluminum	900	26.98	926
Copper	386	63.55	393
Gold	130	196.97	127
Iron	448	55.85	448
Nickel	443	58.69	426
Silver	235	107.87	231
Tungsten	142	183.85	137

Ceramics

		x	25/x
Alumina (Al ₂ O ₃)	775	102	245
Beryllia (BeO)	1050	25	1000
Magnesia (MgO)	940	40	625
Spinel (MgAl ₂ O ₄)	790	142	176
Fused silica (SiO ₂)	740	60	417

Polymers

		x	25/x
Polyethylene	2100	28	892
Polypropylene	1880	42	595
Polystyrene	1360	104	240
Polytetrafluoroethylene	1050	100	250
Nylon 6,6	1670	246	101