PHYSICAL PROPERTIES OF THE PLATINUM METALS

Platinum Metals Review last published a table of the properties of the six platinum metals in October 1963. This revised table includes some more recently determined values and is expressed in SI units where appropriate.

	Platinum	Iridium	Osmium	Palladium	Rhodium	Ruthenium
Atomic number..	78	77	76	46	45	44
Atomic weight ..	195.09	192.22	190.2	106.4	102.9055	101.07
Thermal neutron cross section, barns	9±1	425±15	15.3±0.7	6.0±1.0	150±5	3.0±0.8
Lattice structure	F.c.c.	F.c.c.	C.p.h.	F.c.c.	F.c.c.	C.p.h.
Lattice constants at 20°C, Å *a*	3.9229	3.8392	2.7340	3.8906	3.8029	2.7056
c/a			1.5799			1.5825
Density at 20°C, kg/m³	21450	22650	22610	12020	12410	12450
Melting point, °C	1768	2443	3050	1552	1960	2310
Thermal conductivity at 0–100°C, W/mK ..	73	148	87	76	150	105
Specific heat at 0°C, J/kg K ..	131.2	128.4	129.3	244.3	246.4	230.5
Coefficient of linear expansion at 20–100°C, $\times 10^6$	9.1	6.8	6.1	11.1	8.3	9.1
Vapour pressure at 1500°C, Torr	10^{-6}	10^{-8}	10^{-12}	10^{-2}	10^{-6}	10^{-8}
Resistivity at 0°C, μohm.cm ..	9.85	4.71	8.12	9.93	4.33	6.80
Temperature coefficient of resistance at 0–100°C	0.0039	0.0043	0.0042	0.0038	0.0046	0.0042
Thermal e.m.f. against platinum at 1000°C, mV		+12.73		−11.505	+14.05	+9.760
Mass susceptibility χ, cm³/g, $\times 10^6$	+0.9712	+0.133	+0.052	+5.231	+0.9903	+0.427
Thermionic function, A/cm²K²	64	170	120	60	100	
Work function φ, V	5.27	5.40	4.8	4.99	4.90	>4.54
Tensile strength, annealed, lb/in², $\times 10^3$ ..	18	160		25	100	72
kN/m², $\times 10^3$..	124	1100		172	688	496
Modulus of elasticity in tension, lb/in², $\times 10^6$ ..	25	75	81	17	46	60
kN/m², $\times 10^6$..	172	516	556	117	316	417
Hardness, annealed, Hv	40–42	200–240	300–670	40–42	100–102	200–350