

Reference Data

PHYSICAL PROPERTIES OF THE PLATINUM METALS

The April 1957 issue of *Platinum Metals Review* included a table of the properties of the six platinum metals. This table has now been revised to include more recent determinations of certain of these properties.

	Platinum	Iridium	Osmium	Palladium	Rhodium	Ruthenium
Atomic number ..	78	77	76	46	45	44
Atomic weight ..	195.09	192.2	190.2	106.4	102.905	101.07
Thermal neutron cross section, barns ..	9	440	15	8	156	2.6
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) $\begin{matrix} a \\ c/a \end{matrix}$	3.9231	3.8394	2.7341 1.5800	3.8907	3.8031	2.7056 1.5820
Density at 20°C ..	21.45	22.65	22.61	12.02	12.41	12.45
Melting point, °C	1769	2443	3050	1552	1960	2310
Thermal conductivity, (0-100°C), joule cm/cm ² /sec/°C ..	0.73	1.48	0.87	0.76	1.50	1.05
Specific heat, cal/g/°C at 0°C ..	0.03136	0.0307	0.0309	0.0584	0.0589	0.0551
Coefficient of linear expansion (20-100°C) × 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, microhm-cm at 0°C ..	9.85	4.71	8.12	9.93	4.33	6.71
Temperature coefficient of resistance .. (0-100°C) ..	0.0039	0.0043	0.0042	0.0038	0.0046	0.0042
Thermal e.m.f. against platinum at 1000°, mV ..		+12.73		-11.505	+14.05	
Mass susceptibility, χ , cm ³ /g × 10 ⁶ ..	+0.9712	+0.133	+0.052	+5.231	+0.9903	+0.427
Thermionic function A, amp. cm ⁻² (°K) ⁻²	64	170		60	100	
Work function, ϕ volts ..	5.27	5.40		4.99	4.90	
Tensile strength, annealed, lb/in. ²	18,000	160,000		25,000	100,000	
Modulus of elasticity in tension, lb/in. ² × 10 ⁻⁶ ..	25	75	81	17	46	60
Hardness, annealed, Hv ..	40-42	200-240	300-670	40-42	100-120	200-350