

Table of Selected Radioactive Isotopes

The A & B subgroup designations, applicable to elements in rows 4, 5, 6, and 7, are those recommended by the International Union of Pure and Applied Chemistry. It should be noted that some authors and organizations use the opposite convention in distinguishing these subgroups.

† The names and symbols of elements 104 - 106 are those recommended by IUPAC. There are systematic alternatives to those suggested by the purported discoverers. Berkeley (USA) researchers have proposed Rutherfordium, Rf, for element 104 and Dubna (USSR) researchers, who also claim the discovery of these elements have proposed different names (and symbols).

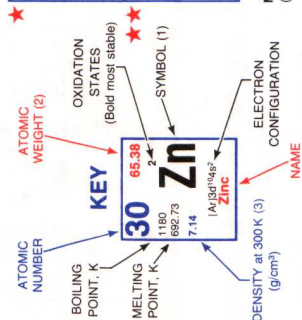
104	Unq	$(\text{Rn})5f^{14}6d^7s^2 \uparrow$ (Unnilquadium)
105	Unq	$(\text{Rn})5f^{14}6d^7s^2 \uparrow$ (Unnilpentium)
106	Unh	$(\text{Rn})5f^{14}6d^7s^1 \uparrow$ (Unnilhexium)

NOTES:

- (1) Black — solid.
Red — gas.
Blue — liquid.
- (2) Based upon carbon-12. () indicates most stable or best known isotope.
- (3) Entries marked with asterisks refer to the gaseous state at 273 K and 1 atm and are given in units of α/l .

Outline — synthetically prepared.

Side 1



Percent Ionic Character of a Single Chemical Bond

Difference in electronegativity	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2
Percent ionic character %	0.5	1	2	4	6	9	12	15	19	22	26	30	34	39	43	47	51	55	59	63	67	70	74	76	79	82	84	86	88	89	91	92

[illegible]

DATA CONCERNING THE MORE STABLE ELEMENTARY (SUBATOMIC) PARTICLES					
Symbol	Neutron n	Proton p	Electron* e (e ⁻)	Neutrino* ν	Photon γ
Rest mass (kg)	1.67493×10^{-27}	1.67265×10^{-27}	9.1095×10^{-31}	~0	0
Relative atomic mass (¹ H = 12)	1.008665	1.007276	5.48580×10^{-4}	~0	0
Charge (C)	0	1.60219×10^{-19}	-1.60219×10^{-19}	0	0
Radius (m)	8×10^{-16}	8×10^{-16}	$< 1 \times 10^{-16}$	~0	0
Spin quantum number	1/2	1/2	1/2	1/2	1
Magnetic Moment†	$-1.913 \mu_N$	$2.793 \mu_N$	$1.001 \mu_B$	0	0

* The positron (e⁺) has properties similar to those of the (negative) electron or beta particle except that its charge has opposite sign (-). The antineutrino (ν̄) has properties similar to those of the neutrino except that its spin (or rotation) is opposite in relation to the rest of the nucleus.
† μ_N = Nuclear magneton and μ_B = Bohr magneton.

[illegible]

CRYSTAL STRUCTURE (2)	SYMBOL	IONIC RADIUS, Å	COV. RADIUS, Å (7)	ATOMIC VOLUME, cm ³ /mol (8)	HEAT OF VAPORIZATION, kJ/mol (4)	ACID-BASE PROPERTIES (1)	ELECTRONEGATIVITY (Pauling 3)
★		1.65	1.25	9.2	—	—	1.65
	Ce	1.65	1.25	9.2	—	—	1.65
		1.12	1.05	1.13	—	—	1.12
	Pr	1.12	1.05	1.13	—	—	1.12
		1.65	1.25	9.2	—	—	1.65
	Th	1.65	1.25	9.2	—	—	1.65
		1.65	1.25	9.2	—	—	1.65
	Pa	1.65	1.25	9.2	—	—	1.65
		1.65	1.25	9.2	—	—	1.65
	U	1.65	1.25	9.2	—	—	1.65
		1.65	1.25	9.2	—	—	1.65
	Pu	1.65	1.25	9.2	—	—	1.65
		1.65	1.25	9.2	—	—	1.65
	Am	1.65	1.25	9.2	—	—	1.65
		1.65	1.25	9.2	—	—	1.65
	Cm	1.65	1.25	9.2	—	—	1.65
		1.65	1.25	9.2	—	—	1.65
	Bk	1.65	1.25	9.2	—	—	1.65
		1.65	1.25	9.2	—	—	1.65
	Cf	1.65	1.25	9.2	—	—	1.65
		1.65	1.25	9.2	—	—	1.65
	Es	1.65	1.25	9.2	—	—	1.65
		1.65	1.25	9.2	—	—	1.65
	Fm	1.65	1.25	9.2	—	—	1.65
		1.65	1.25	9.2	—	—	1.65
	Md	1.65	1.25	9.2	—	—	1.65
		1.65	1.25	9.2	—	—	1.65
	No	1.65	1.25	9.2	—	—	1.65
		1.65	1.25	9.2	—	—	1.65
	Lr	1.65	1.25	9.2	—	—	1.65

[illegible]

The names and symbols of elements 104 - 106 are those recommended by IUPAC as systematic alternatives to those suggested by the purported discoverers. Berkeley (USA) researchers have proposed Rutherfordium, Rf, for element 104 and Hahnium, Ha, for element 105. Dubna (USSR) researchers, who also claim the discovery of these elements have proposed different names (and symbols).

NOTES: (1) For representative oxides (higher valence) of group. Oxide is acidic if color is red, basic if color is blue and amphoteric if both colors are shown. Intensity of color indicates relative strength.

alline)

ELECTRICAL CONDUCTIVITY
 $10^6 \Omega^{-1} \text{cm}^{-1}$ (6) (Poly is Po

— THERMAL CONDUCTIVITY,

 $W \text{ cm}^{-1} \text{ K}^{-1} (3)$