PERIODIC TABLE OF THE ELEMENTS

»Zn 65 (244.1 d) β⁺, EC

72 (14.10 h) β

79 (6.5×10⁴ v) B

74 (17.9 d) B-, B+, EC

"Ga 67 (78.2 h) EC

"Ge 68 (275 d) EC

33As 73 (80.3 d) EC

»Se 75 (118.5 d) β

35Br 82 (35.34 h) β

30Kr 81 (2.1x105 v) EC

37 (10.72 y) β 88 86 (18.7 d) β⁻ 87 (4.8×10¹¹ y) β⁻

... 88 (106 6 d) R+ FC

34**Sr** 90 (28.8 y) β

«Zr 93 (1.5×10° γ) β -95 (64.0 d) β -

"Nb 94 (2.0x10⁴ y) β⁻ 95 (35.15 d) β⁻

«Mo 99 (66.02 h) β

Te 97 (2.6x10° v) EC

"Ru 106 (367 d) B

45Rh 101 (3.3 y) EC

"Pd 103 (17.0 d) EC

«Ag 108 (127 y) EC

...Cd 109 (453 d) EC

aln 114 (49.51 d) [

VIA

[Arl3d=4e1

2890 **V**O

95.9

soSn 121 (76 y) β

24

2130

7 19

[Arl2d3/e2

[Kr]4d45e

92.906

110 (252 d) β⁻ 111 (7.45 d) β

98 (4.2×10⁶ v) /

99 (2.13×10⁵ y) B

85 (10.72 v) E

1 (15.3 min) B

3 (12.26 y) β

7 (53.3 d) EC 10 (1.6x10⁴ y) β

C 11 (20.40 min) β' 14 (5730 y) β

-E 18 (109 8 min) R

12Mg 28 (20.9 h) β

S 35 (87.2 d) β

PCI 36 (3.01x105 y)

Ar 37 (35.02 d) EC

30 1265 VI B

42 (12 36 b) B 20Ca 45 (165 d) B

.. Se 46 (83 80 d) B

24Cr 51 (27.70 d) EC

Mn 53 (2x10¢ v) E

₁₆Fe 59 (44.6 d) β

-Co 56 (78 8d) 8+ FC

60 (5.272 y) (

36.0 h) β⁺, EC 59 (8x10⁴ y) EC

63 192 VI B

IVA

[Ar]3d²4s²

[Kr]4d25e

104 (261

П

IIIA

[Ar]3d14e2

39 88.905

1193

3473 1323 Ra

10.07

CONFIGURATION

89227.0278

SC 1943

54 (313.0 d) E0 56 (2.578 h) β'

40 (1.28x10° y) EC

"Na 22 (2.602 y) β+, EC

24 (15 02 h) B

Al 26 (7.2×105 y) β+,EG

32 (14.26 d) β

38 (37.2 min) /

GROUP

IA

Hydrogen

20.268 14.025

0.0899*

3

336.35

961 312.64 1.53

(g/cm³)

1 007

Na

IIA

12 24.30

1.55

56

|Ar|4s2

87.6

9

|Xel6s

88 226.025

Be

Table of Selected Radioactive Isotopes

Selected Radioactive Isotones Naturally occurring radioactive isotopes are designated by a mass 35b 124 (60.20 d) β⁻ 125 (2.7 v) β⁻ »Pa 231 (3.28x104 y) α number in blue (although some are also manufactured). Letter m in-185 (75.1 d) β⁻ 188 (69 d) β⁻ 233 (1.59×10⁵ y) a 234 (2.44×10⁵ y) a dicates an isomer of another isotope of the same mass number ₅₂Te 121 m(154 d) IT Half-lives follow in parentheses, where s, min, h, d, and y stand re-**Re 187 (5×1010 v) B 123 m(119 7 d) IT (7.04×108 y) o 127 m(109 d) IT 20s 194 (6.0 v) B (2.34×107 v) enectively for seconds minutes hours days and years. The table (4.47×10° y) o includes mainly the longer-lived radioactive isotopes; many others 131 (8.040 d) β (1.6x10⁷ y) β 7/r 192 (74.2 d) β-, β+, EC »Np 236 (1.1×10⁵ y) EC, β⁻ 237 (2.14×10⁶ y) α have been prepared. Isotopes known to be radioactive but with -Au 195 (183 d) EC .. Xe 133 (5 25 d) R 196 (6.18 d) β⁺ 198 (2.696 d) β half-lives exceeding 1012 v have not been included. Symbols de-135 (9.10 h) β 239 (2 346 d) B scribing the principal mode (or modes) of decay are as follows VIII 11Cs 134 (2.06 v) B «Pu 238 (87.75 y) α 199 (3.15 d) B (these processes are generally accompanied by gamma radiation): 135 (2.9×10° y) 137 (30.17 y) β 12 41×104 v) ыHa 203 (46.8 d) В alpha particle emission (6.54×10³ y) a (3.8×10⁵ y) a "TI 204 (3.77 y) β beta particle (electron) emission «Ba 140 (12.8 d) B ...Ph 202 (3x105 v) EC 244 (8 3×107 v) a position emission gla 137 (6x104 y) EC 205 (3x10⁷ y) EC 210 (22.3 y) β⁻, α m 241 (432 y) α 243 (7.37×10³ y) α EC orbital electron capture 140 (40 3 6) 6 -Am 241 0.95 (at 26 atm)).1787•He isomeric transition from upper to lower isomeric state «Ce 144 (284 d) β **Bi 207 (38 y) EC 208 (3.7×10⁵ y) EC *Pr 142 (19.1 h) β' *Nd 147 (11.1 d) β' «Cm 242 (163.2 d) α spontaneous fission 244 (18.12 y) α 247 (1.55x10⁷ y) α 248 (3.5x10³ y) α, SF 210 (5.01 d) B-, o IIIB IVB VIB VIIB VB 210 m(3x10⁴ y) α •Pm 145 (18 y) EC 147 (2.62 y) β ыPo 208 (2.90 v) a "Bk 247 (1.4x10³ y) α 18.99840 14.006 20.17 ••Sm 146 (7x10⁷ y) α 151 (93 y) β 209 (102 y) α 210 (138.38 d) α 10.81 12.01 15.999 «Cf 249 (351 y) α 251 (900 y) α ωEu 152 (13 y) β+, EC. β sAt 209 (5.4 h) EC, α 210 (8.1 h) EC 211 (7.21 h) EC, α 4275 2300 4470# 90.18 -Es 252 (472 d) α 50.35 4 553 253 (20.47 d) α 254 (276 d) α 0.901* 4Gd 150 (2.1×10° v) a 2 34 2 62 251 420+ 1 696 "Tb 158 (1.2×10³ y) EC, β •Rn 222 (3.824 d) α 255 (20.1 h) α 257 (100.5 d) α νFr 212 (19.3 min) EC, α 222 (15 min) β⁻ 223 (21.8 min) β⁻ 1s22s2p3 160 (72.3 d) B »Ho 166 m(1.2x103 y) β 101 Md 258 (55 d) α "Tm 170 (128 6 d) B 18 39.948 171 (1.92 y) β⁻ ₁₇Yb 169 (32.0 d) EC **Rα 226 (1.60×10³ y) α **Ac 227 (21.77 y) β 5 30.9737 ...No 259 (58 min) α 13 26.981 28.085 32.06 35.453 100Lr 260 (3.0 min) α wTh 228 (1.913 y) α 230 (7.7x10⁴ y) α 232 (1.40x10¹⁰ y) α 104 261 (65 s) α 175 (4.19 d) B 2.7x1010 y) β 105 262 (40 s) α 106 263 (0.9 s) α 933 25 317 30 36. 888 83.81 9 2Ta 182 (115.0 d) B 17* 2 33 1 82 1 79/1 INel3s2n3 INel3s2p6 VIIA -VIIIA IB IIB 30 31 33 74.9216 25 36 83.80 55.847 63.54 78.9 ±3.5 -246 3201 1768 Se 1517 **Mn** 1809 1726 692.73 265.90 3 74 • 8.90 8 90 5 32 [Ar]3d⁷4s² [Ar]3d104s1 [Arl3d104s2n3 [Ar]3d104s2n4 [Ar]3d54e [Arl3d64e2 [Arl3d104e2n Krypton 48 53126.904 54 131.30 112.4 101.0 107.86 114.8 118.6 127.6 161.36 **Xe** 1825 HI 91 9 II 12.2 12.4 12.0 8.65 6.68 [Kr]4d105s [Kr]4d105s2 [Kr]4d105s2n1 IKrl4d105s2n (Kr)Ad55s [Kr] 4d'5s' [Kr]4d85s [Kr]4d105s2n2 IKrl4d105s2n5 Xenon

22.4 [Xe]4f145d76s2 [Xe]4f145d56s2 105 (262 106 † 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 discov-Rn]5f'*6d*7s*† Jnnilhexium ery of these elements have proposed different names (and symbols).

21.0

11.5

76

23468

22 5

7.6.4.2

n

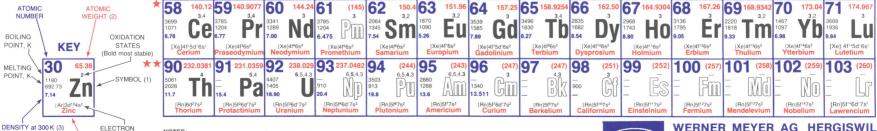
The A & B subgroup designations, applicable to elements in rows 4, 5, 6, and 7, are those recommended by the International Union of Pure and Applied Chemistry. It should be noted that some authors and organizations use the opposite convention in distinguishing these subgroups.

[Xe]4f145d106s2p3

207

[Xe]4f145d106s2p2

Lead



NOTES: (1) Black - solid Red - gas. Blue - liquid.

Outline - synthetically prepared

(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 g/I.



WERNER MEYER AG HERGISWIL Seestrasse 49 CH-6052 Hergiswil Schweiz

86

9.91*

IXel4f145d106s2p

42

78

100

[Xe]4f¹⁴5d⁹6s¹

3.1

19.3

[Xe] 4f145d106s1

13.53

11.85

[Xe]4f145d106s2p1

192.22

2.3.4.6

TABLE OF PERIODIC PROPERTIES OF THE ELEMENTS

