

The Periodic Table

A work of art!

Pg 184

The Periodic Table

- Columns are called groups, or families
 - Rows are called periods
 - Elements are arranged according to atomic number (# protons)
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Periods

- A new row means a new electron orbit
 - The end of the row means a full outer orbit
 - A full outer orbit means stability
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Groups

- 3 main groups are the metals, non-metals and metalloids

Legend:

- Atomic number
- Symbol
- Atomic weight
- Metal (Red)
- Semimetal (Green)
- Nonmetal (Yellow)

1	2											13	14	15	16	17	18
1 H 1.008																	2 He 4.003
3 Li 6.941	4 Be 9.012											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18
11 Na 22.99	12 Mg 24.31	3	4	5	6	7	8	9	10	11	12	13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.07	17 Cl 35.45	18 Ar 39.95
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.88	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.69	29 Cu 63.55	30 Zn 65.39	31 Ga 69.72	32 Ge 72.61	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc 98.91	44 Ru 101.1	45 Rh 102.9	46 Pd 106.4	47 Ag 107.9	48 Cd 112.4	49 In 114.8	50 Sn 118.7	51 Sb 121.8	52 Te 127.6	53 I 126.9	54 Xe 131.3
55 Cs 132.9	56 Ba 137.3	71 Lu 175.0	72 Hf 178.5	73 Ta 180.9	74 W 183.8	75 Re 186.2	76 Os 192.2	77 Ir 192.2	78 Pt 195.1	79 Au 197.0	80 Hg 200.6	81 Tl 204.4	82 Pb 207.2	83 Bi 209.0	84 Po 209.0	85 At 210.0	86 Rn 222.0
87 Fr 223.0	88 Ra 226.0	103 Lr 262.1	104 Rf 261.1	105 Db 262.1	106 Sg 263.1	107 Bh 264.1	108 Hs 265.1	109 Mt 268	110 Uun 269	111 Uuu 272	112 Uub 277	113 Uut 289	114 Uuq 289	115 Uup 289	116 Uuh 289	117 Uus 293	118 Uuo 293
		57 La 138.9	58 Ce 140.1	59 Pr 140.9	60 Nd 144.2	61 Pm 146.9	62 Sm 150.4	63 Eu 152.0	64 Gd 157.3	65 Tb 158.9	66 Dy 162.5	67 Ho 164.9	68 Er 167.3	69 Tm 168.9	70 Yb 173.0		
		89 Ac 227.0	90 Th 232.0	91 Pa 231.0	92 U 238.0	93 Np 237.0	94 Pu 244.1	95 Am 243.1	96 Cm 247.1	97 Bk 247.1	98 Cf 251.1	99 Es 252.0	100 Fm 257.1	101 Md 258.1	102 No 259.1		

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Families

- Elements in the same family tend to have similar physical and chemical properties
 - There are 4 main families – alkali metals, alkaline earth metals, halogens, and noble gases
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Alkali Metals

- Group 1 on periodic table (except H)
 - Soft, shiny, very soluble in water
 - Highly reactive (1 valence electron)
 - Form compounds that are mostly white solids
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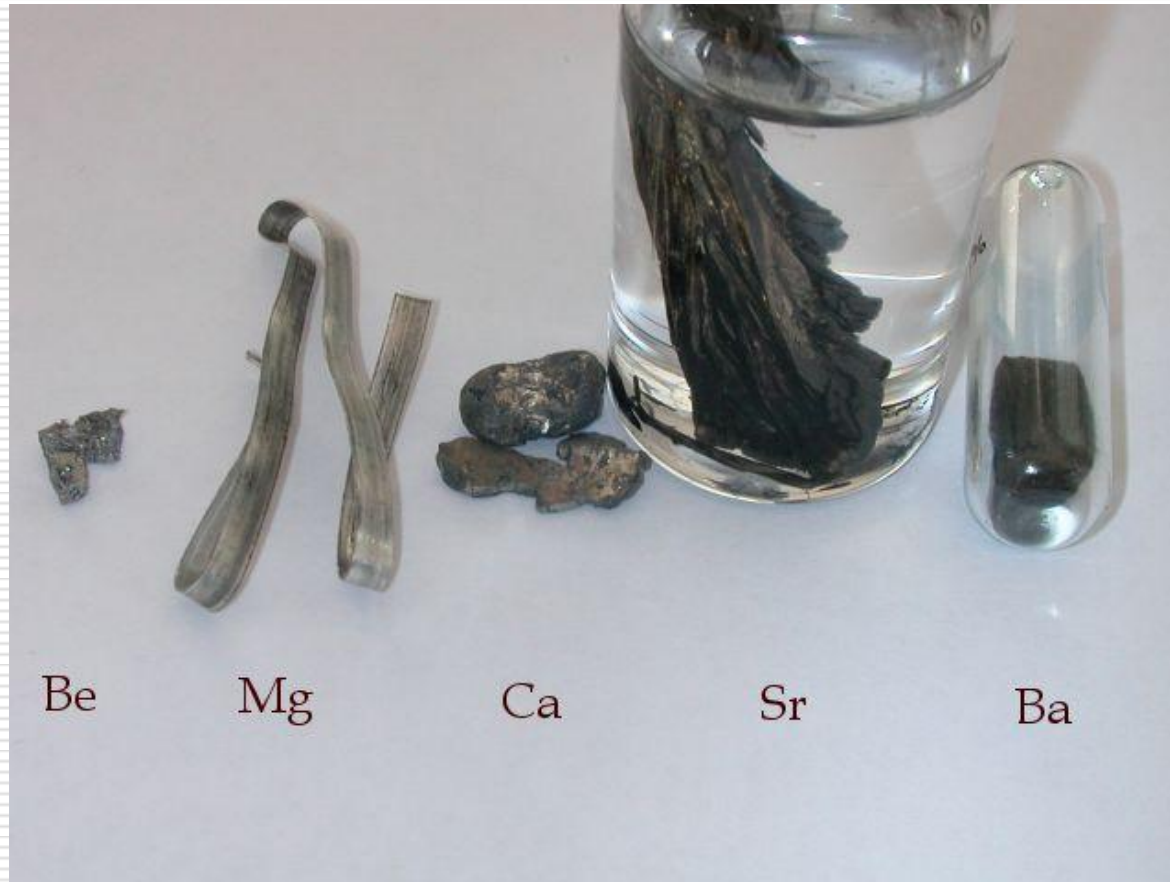
Alkali Metals



Alkaline Earth Metals

- Group 2
 - Shiny, silvery metals
 - Mostly insoluble in water
 - Reactive, but less so than alkali metals (2 valence electrons)
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Alkaline Earth Metals



Halogens

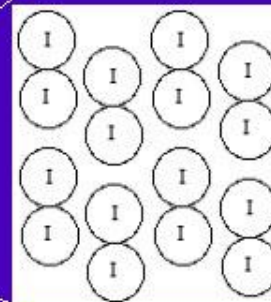
- Group 17
 - Highly reactive, (7 valence electrons)
 - Poisonous
 - All three states of matter at room temperature
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Halogens

iodine



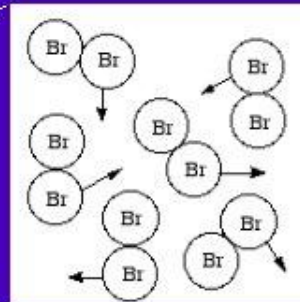
solid



bromine



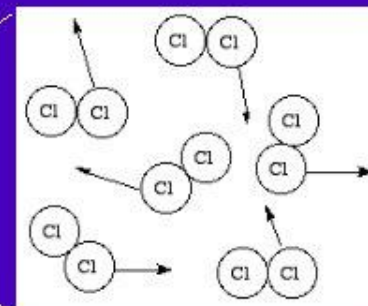
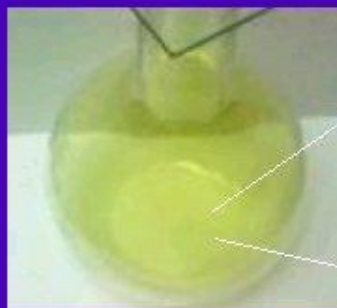
liquid



chlorine

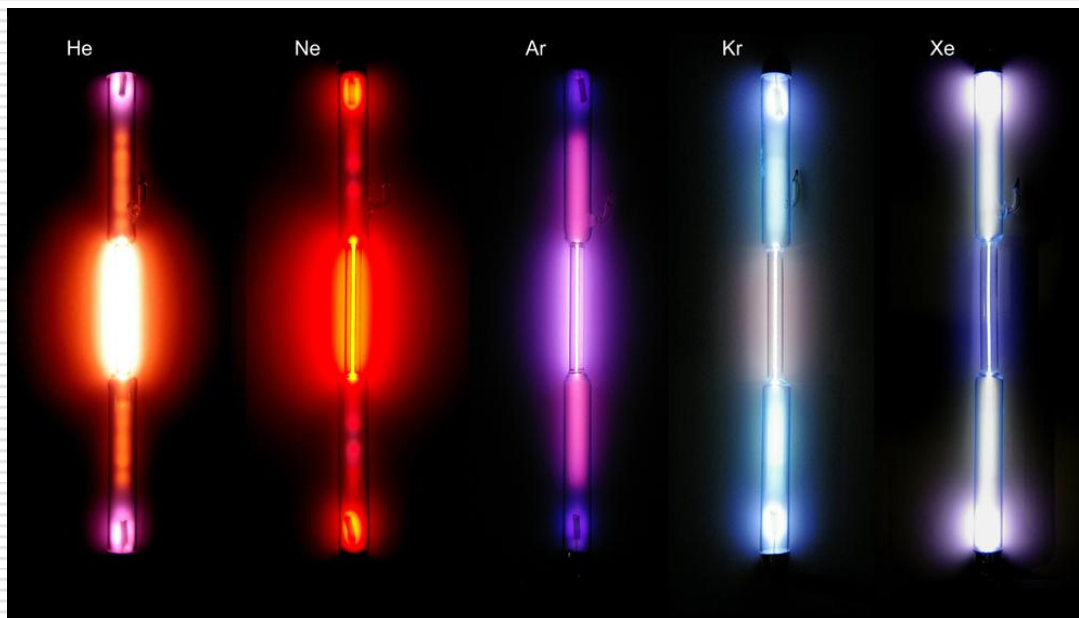


gas



Noble Gases

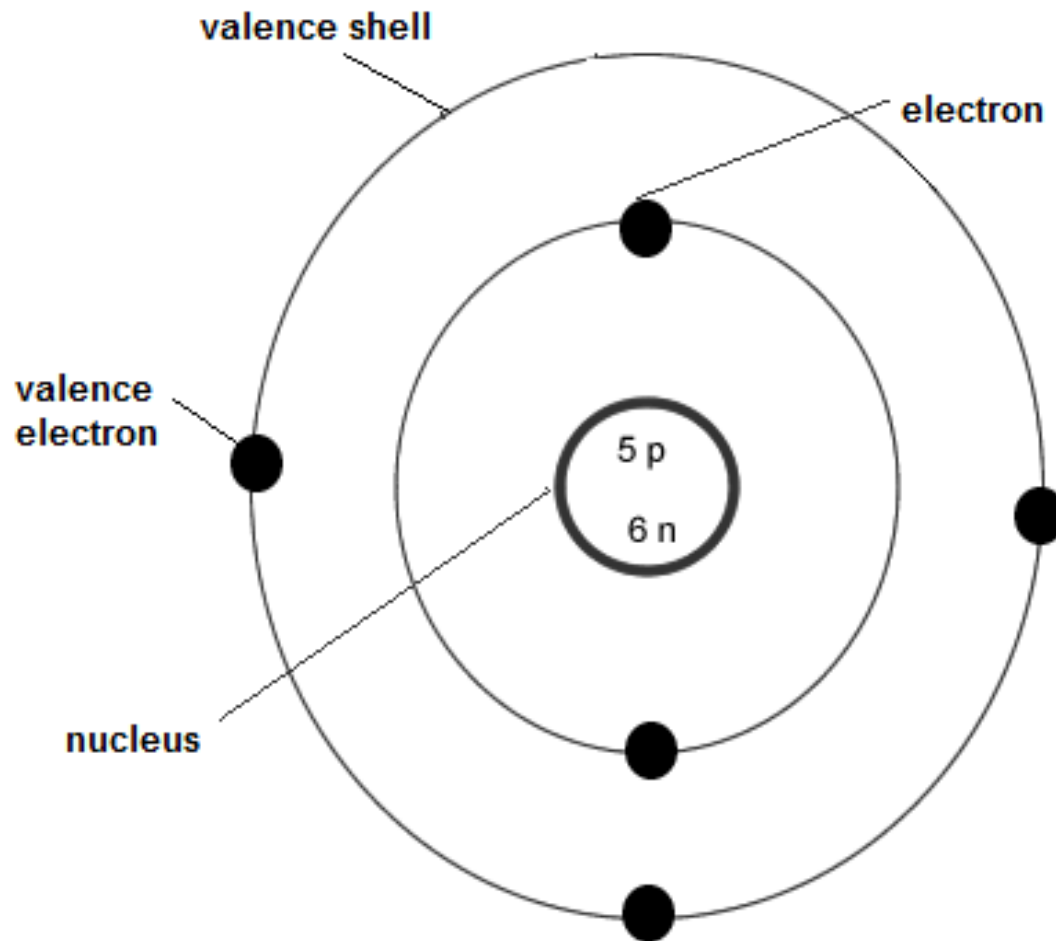
- Group 18
- Very stable (8 valence electrons)



Electrons and Reactivity

- Arrangement of electrons about the nucleus is key to chemical reactivity and formation of compounds
 - Outer shell = **valence shell**
 - Electrons in outer shell = **valence electrons**
 - Electrons required gain or lose to achieve stability = **valence #**
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Electrons & Reactivity



Predicting Reactivity

- Valence electrons have the most energy
 - The **further** the electron is from the nucleus, the **easier** it is to remove from the atom and therefore the more **reactive** the atom is.
 - Filled outer orbits are the most stable arrangement for any atom
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Homework

- Periodic Table Crossword
- B-R. Diagrams 20 Elements
- Page 187 # 1 - 4, 6

