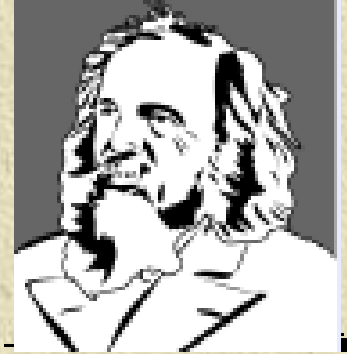


18.3 The Periodic Table of Elements

Partial Periodic Table
Number of valence electrons in parentheses


(1) 1																	(8) 18
H 1	(2) 2											(3) 13	(4) 14	(5) 15	(6) 16	(7) 17	He 2
Li 3	Be 4											B 5	C 6	N 7	O 8	F 9	Ne 10
Na 11	Mg 12	Transition metals - groups 3 - 12 (Variable number of valence electrons)										Al 13	Si 14	P 15	S 16	Cl 17	Ar 18
K 19	Ca 20	3	4	5	6	7	8	9	10	11	12	Ga 31	Ge 32	As 33	Se 34	Br 35	Kr 36
Rb 37	Sr 38	Y 39	Zr 40	Nb 41	Mo 42	Tc 43	Ru 44	Rh 45	Pd 46	Ag 47	Cd 48	In 49	Sn 50	Sb 51	Te 52	I 53	Xe 54

The Periodic Table



In 1871, Dimitri Mendeleev organized information about all known elements in a periodic table, based on similar physical and chemical properties.

It became known as the periodic table of elements.




- The modern periodic table contains 111 different kinds of elements.

- Groups (families) of elements – elements arranged in columns with similar chemical properties.

The Periodic Table of Elements

- ✦ **Elements listed by increasing atomic number.**
- ✦ **Rows (side-to-side) tell how many electrons in each region of the electron cloud.**

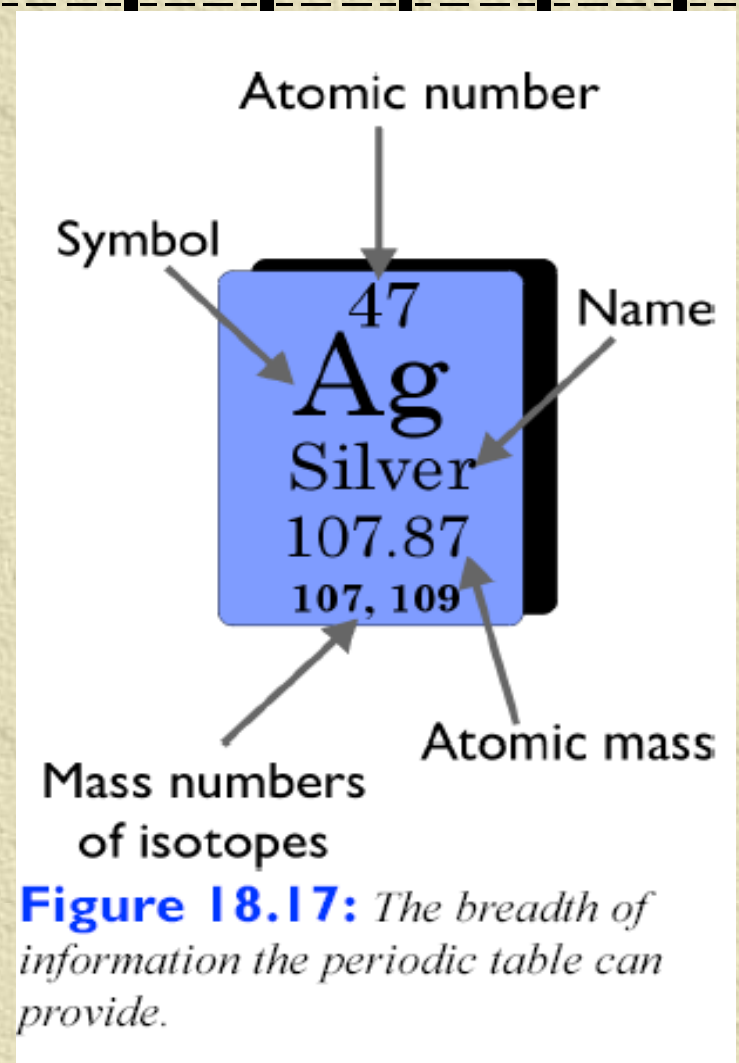
 **Ex. Carbon, in row 2, has 6 electrons.**

**2 in the 1st energy level &
4 in the 2nd (2,4)**

**Valence electrons- electrons
in the outermost region of
the electron cloud (valence
shell) and are involved in
forming chemical bonds.**

Reading the periodic table

Periodic table
can show
different
information.



Chemical Symbols

✦ Chemical symbol - an abbreviation of an element's name. May come from element's Latin or German name. The first letter in a symbol is upper case and the second is lower case.

element	symbol	origin
copper	Cu	<i>cuprium</i>
gold	Au	<i>aurum</i>
iron	Fe	<i>ferrum</i>
lead	Pb	<i>plumbum</i>
potassium	K	<i>kalium</i>
silver	Ag	<i>argentum</i>
sodium	Na	<i>natrium</i>
tin	Sn	<i>stannum</i>

Figure 18.18: The symbols for some elements don't always obviously match their names.

Atomic number, Mass number, Atomic mass

✦ Atomic number- number of protons.

✦ Mass number- protons (P) + neutrons (N).

ex. Silver has two mass numbers:

Ag107 (47 P + 60 N)

Ag109 (47 P + 62 N) They are isotopes.

Cont.

**Atomic mass- average mass
of all known isotopes of an
element.**

**Expressed in atomic mass
units, or amu.**

Partial Periodic Table

(1)

Number of valence electrons in parentheses

(8)

H 1																He 2	
Li 3	Be 4	Transition metals: groups 3-12 (Variable number of valence electrons)										B 5	C 6	N 7	O 8	F 9	Ne 10
Na 11	Mg 12											Al 13	Si 14	P 15	S 16	Cl 17	Ar 18
K 19	Ca 20	Sc 21	Ti 22	V 23	Cr 24	Mn 25	Fe 26	Co 27	Ni 28	Cu 29	Zn 30	Ga 31	Ge 32	As 33	Se 34	Br 35	Kr 36
Rb 37	Sr 38	Y 39	Zr 40	Nb 41	Mo 42	Tc 43	Ru 44	Rh 45	Pd 46	Ag 47	Cd 48	In 49	Sn 50	Sb 51	Te 52	I 53	Xe 54