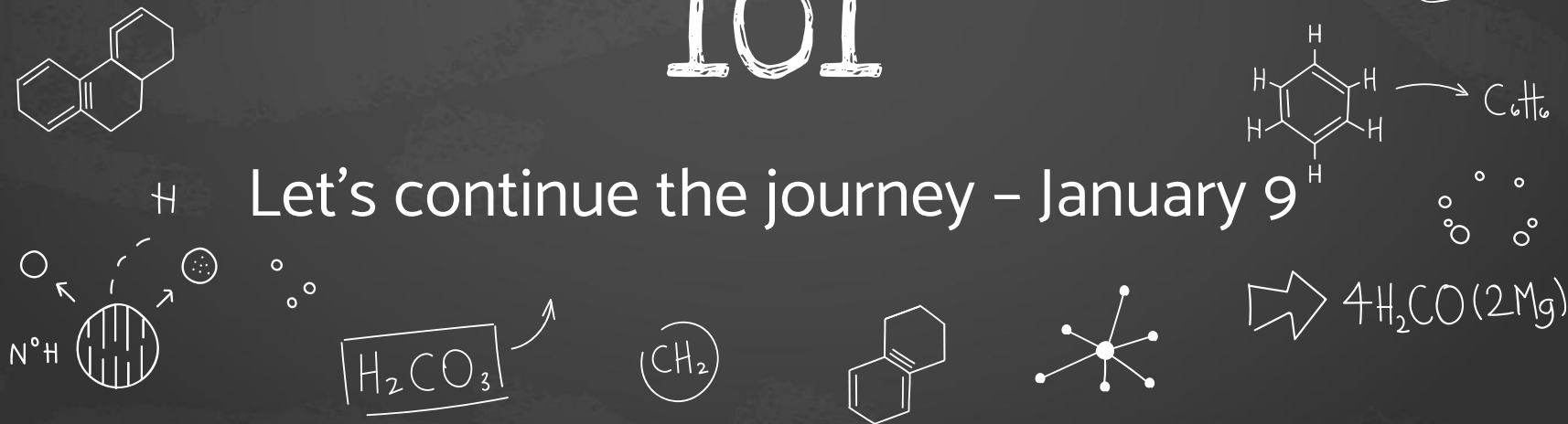




Chemistry - 101

Let's continue the journey – January 9



Which of the following is possible
for the same element:

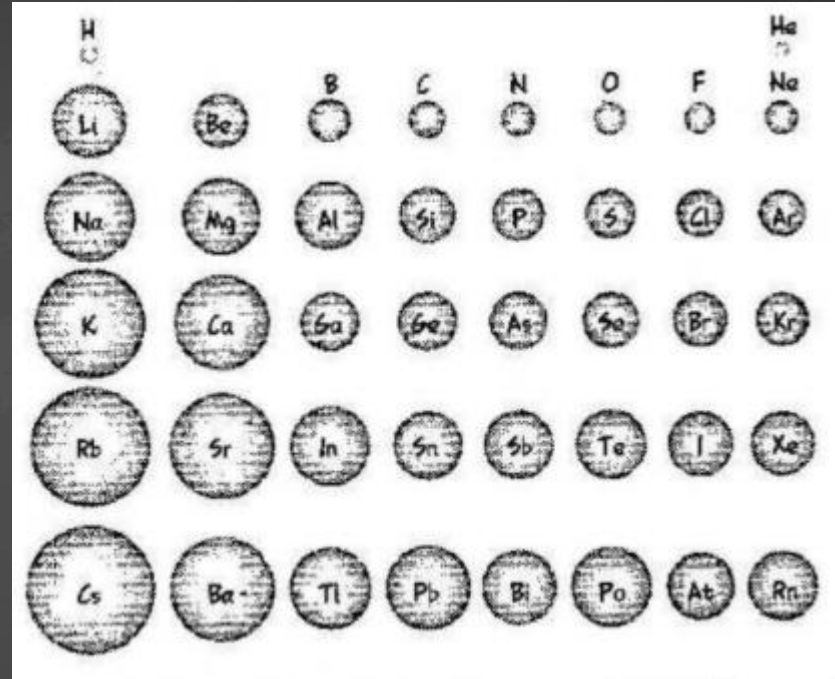
- a) different number of electrons?
- b) different number of protons?
- c) different number of neutrons?

Group→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
↓Period																			
1	1 H																	2 He	
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne	
3	11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar	
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr	
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe	
6	55 Cs	56 Ba	57 La	*	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra	89 Ac	**	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og
				*	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu	
				**	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr	

Going along a row from left to right, atoms get smaller, and moving down a column, they get bigger.

Moving to the right, the bigger charge of the nucleus pulls electrons closer in.

Going down a column, the outer electrons are in higher shells, hence farther away from the nucleus.



Periodic table of the elements

Oxidizing and non-metallic properties

Reducing and metallic properties

Reducing and metallic properties

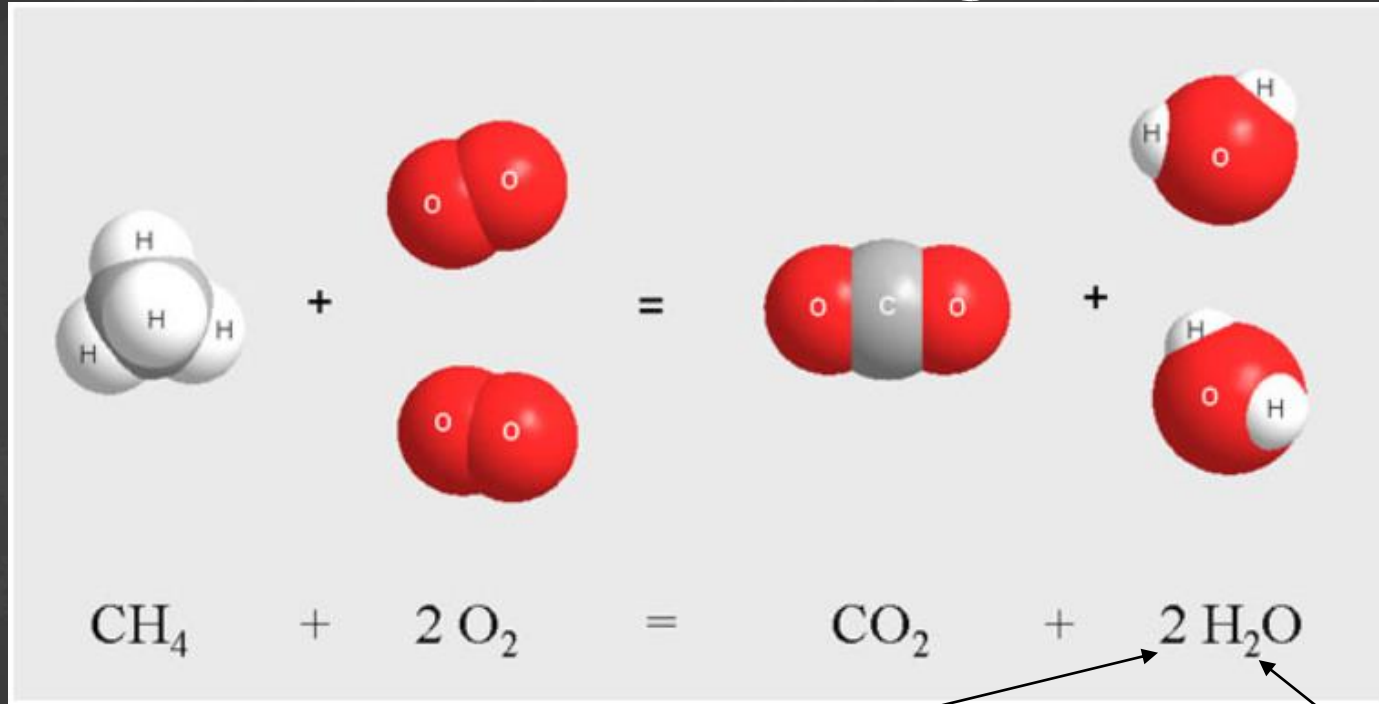
Electronegativity

[illegible]

Chemical reactions

In chemical reactions substances with certain compositions and properties turn into different substances with different compositions and properties BUT the nuclei of atoms DO NOT change.

Combustion of methane in oxygen from the air



Coefficient shows how many molecules participate or form in the reaction

Index shows the number of atoms in a molecules

Combustion reaction



The number of atoms for each element is the same in the left and the right parts of the equation.

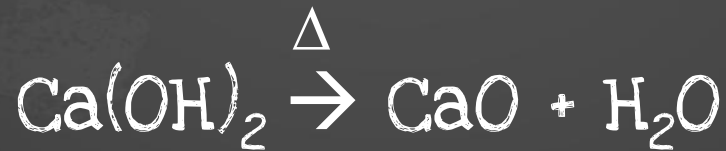
To equate the number of atoms in the left and the right parts of the equation we use coefficients that we write in front of the molecular formulas.

Unlike in math equations, left and right parts of chemical equations cannot be exchanged.

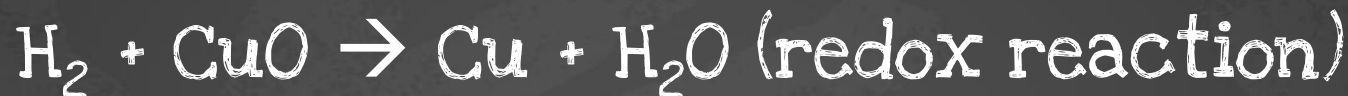
Combination (Synthesis) reaction

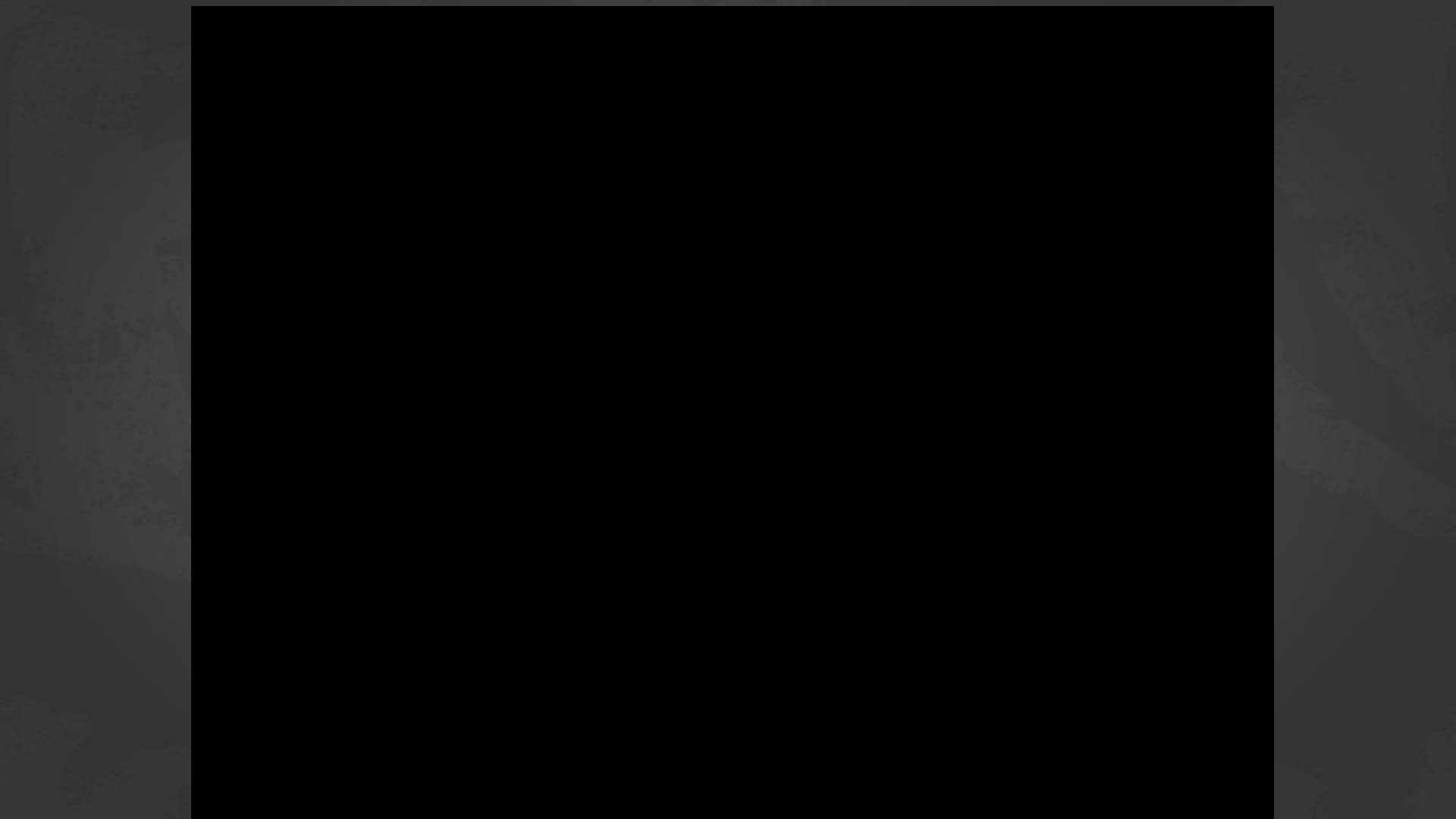


Decomposition reaction



Single and double replacement reactions





This class uses the materials from the following books:

Larry Gonick and Graig Criddle “The cartoon guide to chemistry”

Manyuilov and Rodionov “Chemistry for children and adults”

Kuzmenko, Eremin, Popkov “Beginnings of chemistry”