

Double Replacement Reactions



**always pair a cation (+) with an anion (-)

- 1) Switch ions (cation from 1st with anion from 2nd)
- 2) Cross charges
- 3) Balance



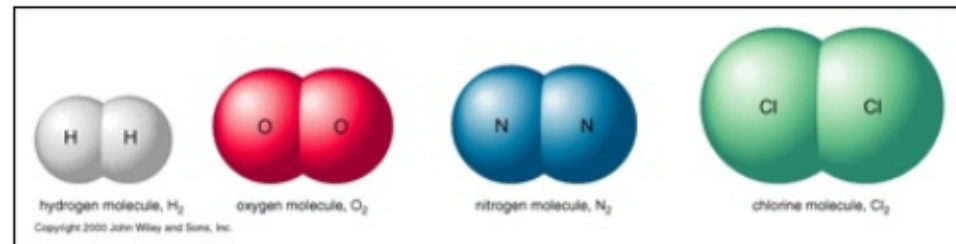
Synthesis Reactions



- 1) Write element symbols
- 2) Combine metal and nonmetal
- 3) Cross charges for elements that are bonded
- 4) Check elements by themselves to see if they are diatomic
- 5) Balance

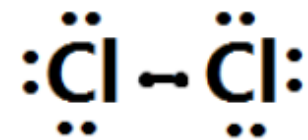
Diatomic Elements

elements that exist in pairs when by themselves
(not bonded to other elements)



Why?

8 valence electrons
(there are also a few other reasons)



How can I remember them?

acronym: **Br I N Cl H O F**

1 IA												13 IIIA		14 IVA	15 VA	16 VIA	17 VIIA	18 VIIIA	
1 H 1.008												5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18		
3 Li 6.94	4 Be 9.01											13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.07	17 Cl 35.45	18 Ar 39.95		
11 Na 22.99	12 Mg 24.31	3	4	5	6	7	8	9	10	11	12	13 Ga 69.72	14 Ge 72.61	15 As 74.92	16 Se 78.96	17 Br 79.90	18 Kr 83.80		
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 72.61	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)	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 118.71	51 Sb 121.75	52 Te 127.60	53 I 126.90	54 Xe 131.29		
55 Cs 132.91	56 Ba 137.33	57 La 138.9	72 Hf 178.5	73 Ta 180.9	74 W 183.9	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 208.98	84 Po (209)	85 At (210)	86 Rn (222)		

Our Chemical Reaction Toolbox:

If elements are bonded together: NaCl
cross charges

If elements are by themselves: $\text{Na} + \text{Cl}$
check to see if they are diatomic





Decomposition Reactions



- 1) Write element symbols
- 2) Break apart reactant into elements
- 3) Cross charges for elements that are bonded
- 4) Check elements by themselves to see if they are diatomic
- 5) Balance

Single Replacement Reactions



- 1) Write element symbols & charges of + or -
- 2) Check activity chart to see if reaction happens
- 3) Switch ions (ALWAYS put a positive with a negative, never two positives together)
- 4) Cross charges for elements that are bonded. Check for diatomics for elements by themselves.
- 5) Balance



- 1) Write element symbols & charges of + or -
- 2) Check activity chart to see if reaction happens
- 3) Switch ions (ALWAYS put a positive with a negative, never two positives together)
- 4) Cross charges for elements that are bonded.
Check for diatomics for elements by themselves.
- 5) Balance

<u>Activity Chart</u>	
	strong
Li	F ₂
K	Cl ₂
Ba	Br ₂
Ca	I ₂
Na	
Mg	
Al	
	weak

- Aluminum chloride + fluorine →



Combustion Reactions

1. Put down CO_2 and H_2O as products
2. Balance carbons & hydrogens first
3. Set up algebra problem for oxygen & solve
4. Double coefficients if necessary