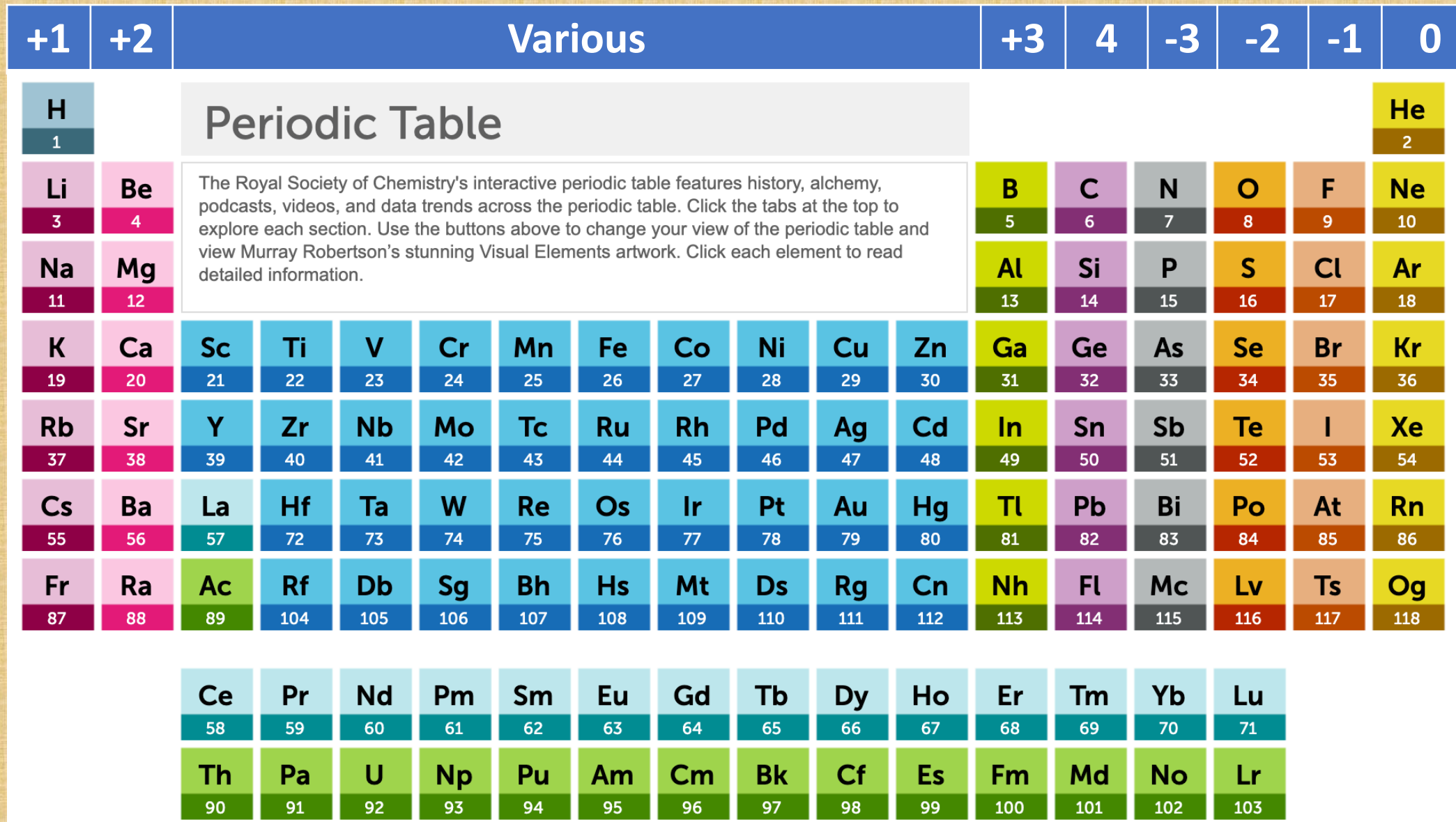
Key Concepts essential for A Level Chemistry

Part 2 - Working out chemical formulae


+1
+2
Various
+3
4
-3
-2
-1
0
Periodic Table
The Royal Society of Chemistry's interactive periodic table features history, alchemy, podcasts, videos, and data trends across the periodic table. Click the tabs at the top to explore each section. Use the buttons above to change your view of the periodic table and view Murray Robertson's stunning Visual Elements artwork. Click each element to read detailed information.
H 1
He 2
Li 3
Be 4
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
Cs 55
Ba 56
La 57
Hf 72
Ta 73
W 74
Re 75
Os 76
Ir 77
Pt 78
Au 79
Hg 80
Tl 81
Pb 82
Bi 83
Po 84
At 85
Rn 86
Fr 87
Ra 88
Ac 89
Rf 104
Db 105
Sg 106
Bh 107
Hs 108
Mt 109
Ds 110
Rg 111
Cn 112
Nh 113
Fl 114
Mc 115
Lv 116
Ts 117
Og 118
Ce 58
Pr 59
Nd 60
Pm 61
Sm 62
Eu 63
Gd 64
Tb 65
Dy 66
Ho 67
Er 68
Tm 69
Yb 70
Lu 71
Th 90
Pa 91
U 92
Np 93
Pu 94
Am 95
Cm 96
Bk 97
Cf 98
Es 99
Fm 100
Md 101
No 102
Lr 103

Polyatomic Ions

Name	Symbol
Ammonium	NH_4^+
Carbonate	CO_3^{2-}
Hydroxide	OH^-
Nitrate(V)	NO_3^-
Nitrate(III)	NO_2^-
Sulphate(VI)	SO_4^{2-}
Sulphite(IV)	SO_3^{2-}
Cyanide	CN^-

Name	Symbol
Hydrogen-carbonate	HCO_3^-
Hydrogen-sulphate (VI)	HSO_4^-
Chlorate(I)	ClO^-
Chlorate(V)	ClO_3^-
Vanadate(V)	VO_3^-
Manganate(VII)	MnO_4^-
Chromate(VI)	CrO_4^{2-}
Dichromate(VI)	$Cr_2O_7^{2-}$

Working out chemical formulae

1. Write down the symbols of the elements and/or polyatomic ions given in the chemical name of the compound

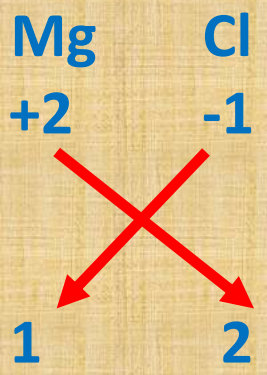
Magnesium Chloride
Mg Cl

2. Now write down the charge of each element or and/or polyatomic ions under the corresponding symbols for the element or polyatomic ions. One must be positive and the other negative. If an element has more than one charge, the name of the compound will indicate which charge is to be used.

Magnesium Chloride
Mg Cl
+2 -1

3. Now cross them over and remove the charge.

Magnesium Chloride



$MgCl_2$

3. This shows the *simplest* combining ratio and may be cancelled down.

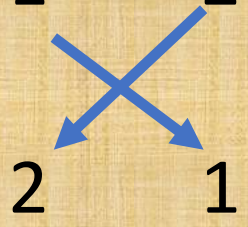
3. Sometimes you can cancel the numbers but, you should **not** do this for organic compounds eg rather than Ca_2O_2 the formula of calcium oxide is CaO.

Examples:

Sodium Sulphate

Na SO_4

1 2



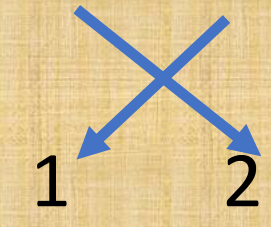
2 1

Na_2SO_4

Calcium hydroxide

Ca OH

2 1



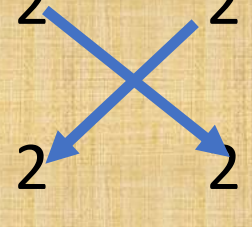
1 2

$Ca(OH)_2$

Barium sulphate

Ba SO_4

2 2



2 2

1 1

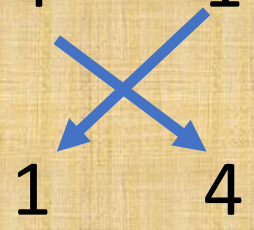
$BaSO_4$

Examples:

Titanium (IV) Chloride

Ti Cl

4 1



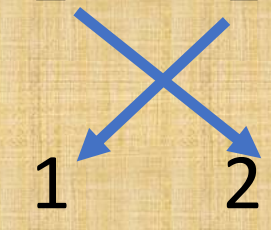
1 4

$TiCl_4$

Calcium nitrate(III)

Ca NO_2^-

2 1



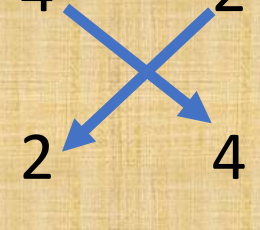
1 2

$Ca(NO_2)_2$

Platinum (IV) sulphate(IV)

Pt SO_3

4 2

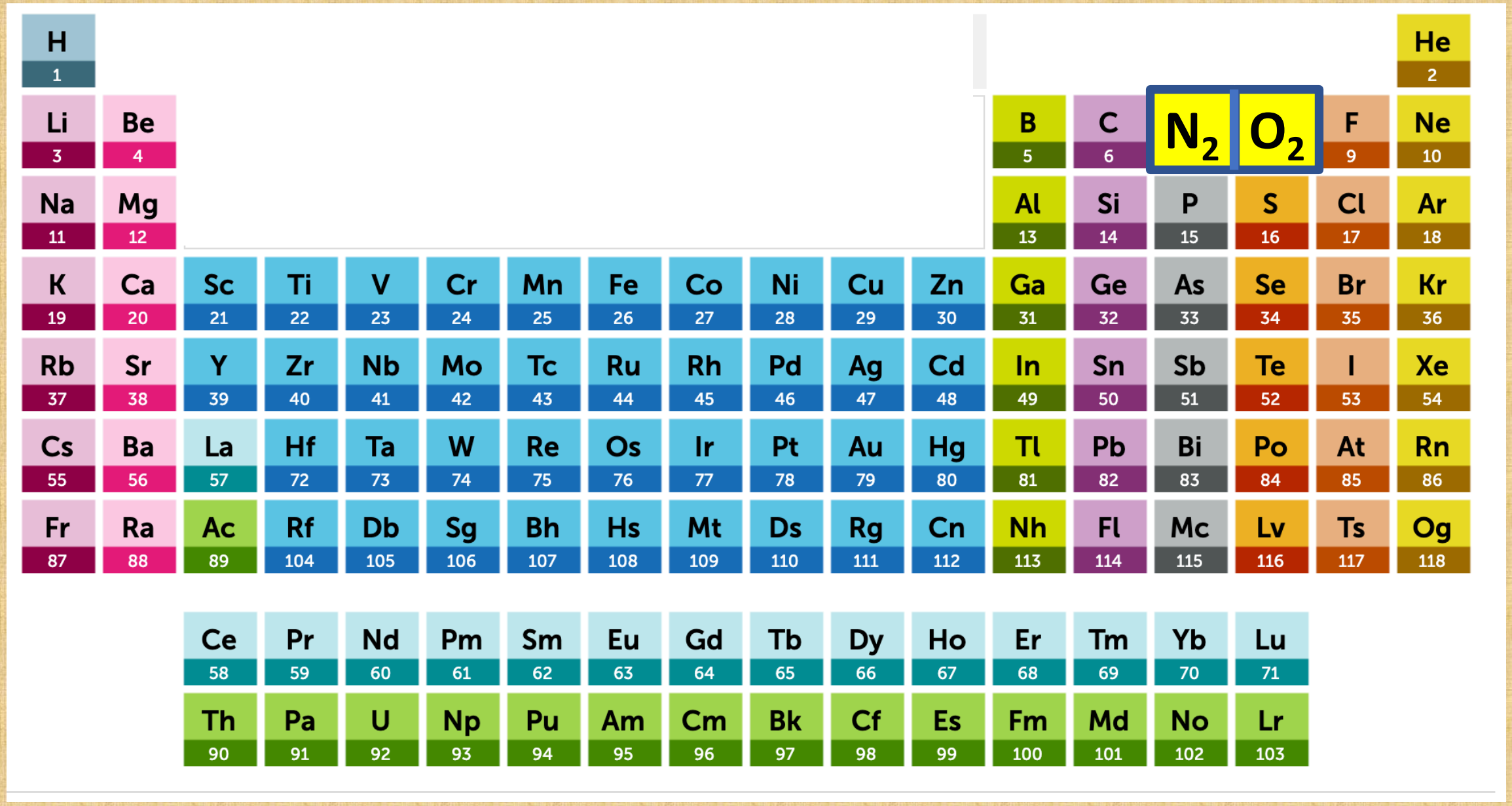


2 4

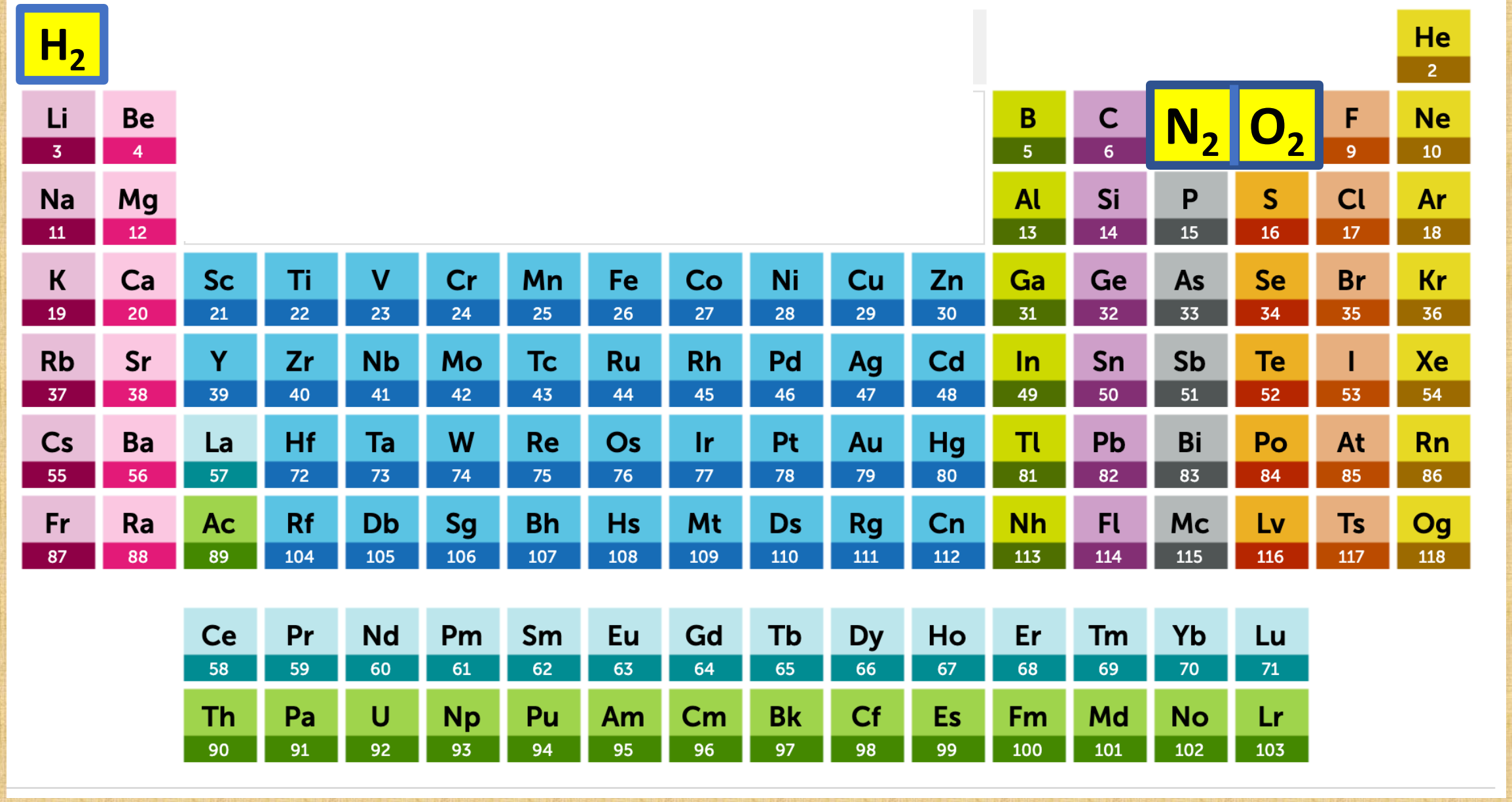
1 2

$Pt(SO_3)_2$

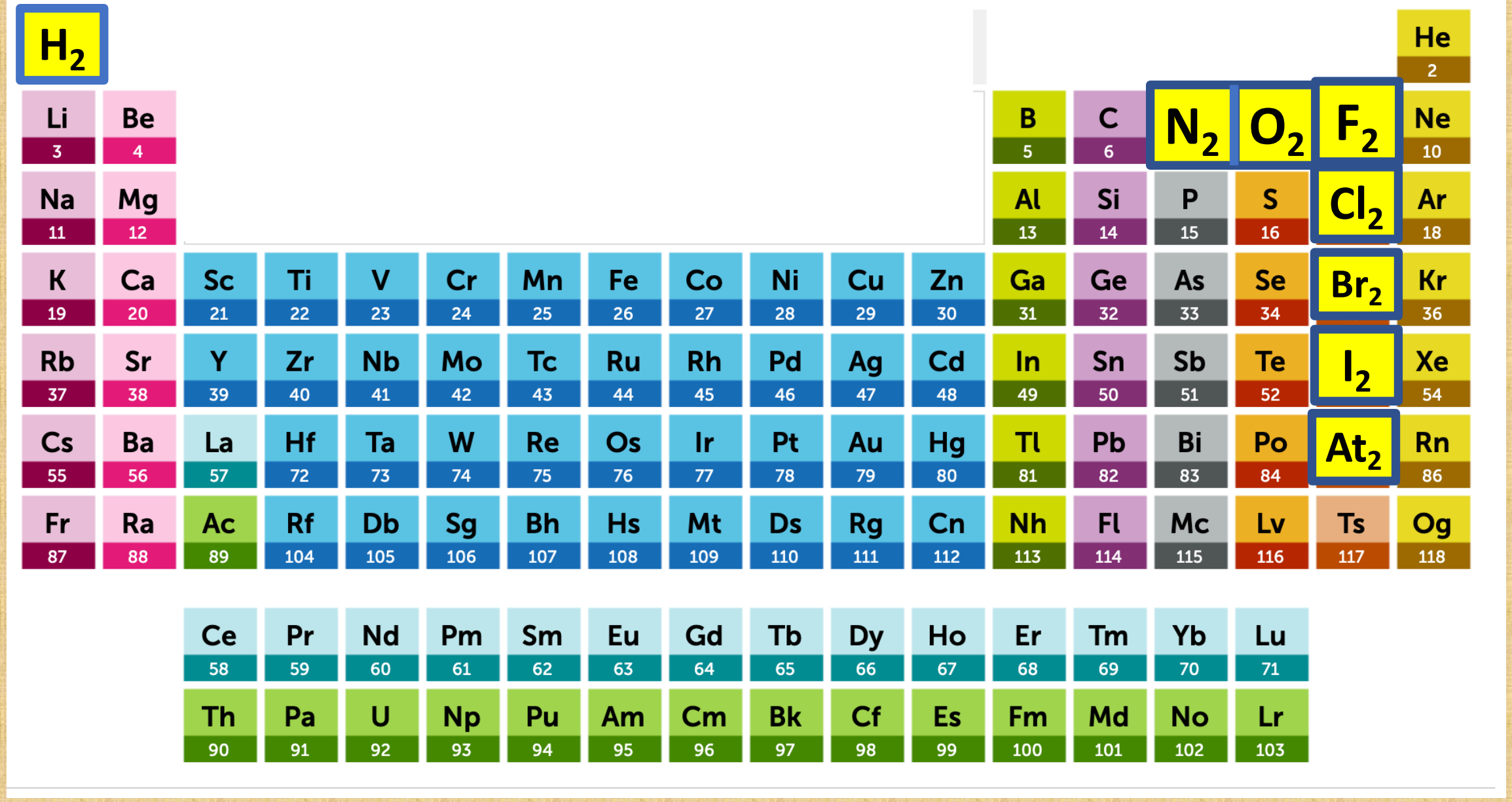
Diatomic Molecules



Diatomic Molecules



Diatomic Molecules



Others to watch out for: