

Summer Memory Work for Chemistry

Look at a Periodic Table while reading.

The columns of elements on the Periodic Table are **groups or families**; each has a family name ie Alkali Metals, Halogens, Nobles Gases. These groups are the vertical columns on the Periodic Table. The charges beside the symbols are an indication of whether atoms are giving or taking electrons; this is referred to as the **charge, valence number, or oxidation number**. It is important to **know symbols and spelling** ahead of time because we will use these to write formulas and then balance equations in our first meeting. *You do not need to know which elements are in which group from memory, but locating the symbol quickly on the Periodic Table will be extremely helpful. (Na is on the left, Br is on the right.)* I have broken these into weeks for you to study during the summer.

Week 1 Polyatomic Ions *Know the names, charges and exact formula for each. (The number of atoms is in the lower right corner of an atom; the overall charge on the group is in the top right. Read the next page**

Ammonium	NH ₄ ⁺	Acetate	C ₂ H ₃ O ₂ ⁻¹	Carbonate	CO ₃ ⁻²
Chlorate	ClO ₃ ⁻¹	Chromate	CrO ₄ ⁻²	Dichromate	Cr ₂ O ₇ ⁻²
Hydroxide	OH ⁻¹	Nitrate	NO ₃ ⁻¹	Permanganate	MnO ₄ ⁻¹
Phosphate	PO ₄ ⁻³	Sulfate	SO ₄ ⁻²		

Week 2

Group IA

Alkali Family +1

Lithium	Li
Sodium	Na
Potassium	K
Rubidium	Rb
Cesium	Cs
Francium	Fr

Group IIA

Alkali Earth +2

Beryllium	Be
Magnesium	Mg
Calcium	Ca
Strontium	Sr
Barium	Ba
Radium	Ra

Group IIIA

Boron Family +3

Boron	B
Aluminum	Al
Gallium	Ga
Indium	In
Thallium	Tl

Week 3

Group IVA

Carbon Family +/- 4

Carbon	C
Silicon	Si
Germanium	Ge
Tin	Sn
Lead	Pb

Group VA

Pnictide Family -3/+5

Nitrogen	N
Phosphorus	P
Arsenic	As
Antimony	Sb
Bismuth	Bi

Group VIA

Chalcogen Family -2

Oxygen	O
Sulfur	S
Selenium	Se
Tellurium	Te
Polonium	Po

Week 4

Group VIIA

Halogen Family -1

Fluorine	F
Chlorine	Cl
Bromine	Br
Iodine	I
Astatine	At

Group VIIIA

Noble Gases 0

Helium	He
Neon	Ne
Argon	Ar
Krypton	Kr
Xenon	Xe
Radon	Rn

Others

Gold	Au	Copper	Cu
Silver	Ag	Nickel	Ni
Zinc	Zn	Uranium	U
Mercury	Hg	Cobalt	Co
Platinum	Pt	Tungsten	W
Iron	Fe	Chromium	Cr
Manganese	Mn	Scandium	Sc

Polyatomic Ions are groups of atoms that have a charge. In the structures below the dots or x represent electrons. Just look at these with interest; we will study these after Christmas.

Ammonium NH_4^+

This formula for the polyatomic ion **ammonium** represents one nitrogen atom bonded to 4 hydrogen atoms and the group has a +1 charge. This is the only positively charged group.

Carbonate CO_3^{-2}

This formula for the polyatomic ion **carbonate** represents one carbon atom bonded to 3 oxygen atoms. The entire group has a -2 charge.

Acetate $\text{C}_2\text{H}_3\text{O}_2^-$

This formula for the polyatomic ion **acetate** represents 2 carbon atoms bonded to 3 Hydrogen atoms and 2 oxygen atoms. The entire group has a charge of -1.

