Review for 1st Exam

Chapter 1-3.

Chapter 1

- What's an:
- element
- atom
- molecule
- compound
- ionic compound
- molecular compound
- 3 states of matter
  - what distinquishes them?

  Classification of matter (homogeneous, solution etc.

Chapter 1.

- Know:
  - Si units
  - prefixes (giga, deca, etc.)
  - Significant figures
  - Density mass/volume
  - Accuracy vs. precision
  - Dimensional analysis

Chapter 2.

- The atomic theory
- Cathode ray tubes (J. J. Thompson)
- Gold Foil experiment
- Oil drop experiment
- Radioactivity
  - What is an α particle? (He nucleus)
  - What is a β particle? (an electron)
  - γ rays (electromagnetic radiation, light)

  subatomic particles

Chapter 2

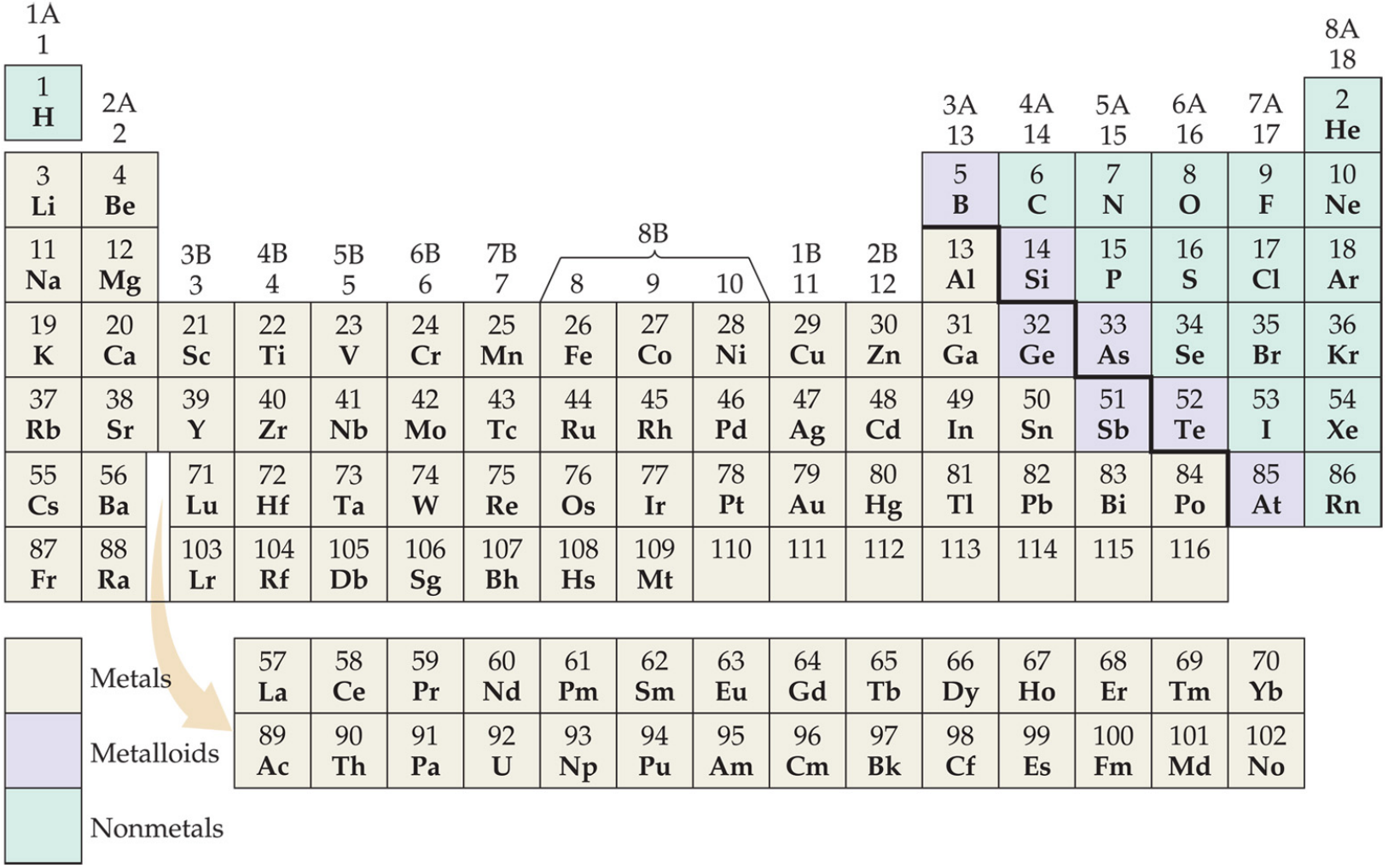
- Symbols of elements

$$^{12}_{6}C$$

- Isotopes
- Average masses
  - calculating ave. mass from nat. abundance
  - Calculating nat. abundance from isotope data.

Chapter 2

- Periodic table



Chapter 2

- The common groups

Group	Name	Elements
1A	Alkali metals	Li, Na, K, Rb, Cs, Fr
2A	Alkaline earth metals	Be, Mg, Ca, Sr, Ba, Ra
6A	Chalcogens	O, S, Se, Te, Po
7A	Halogens	F, Cl, Br, I, At
8A	Noble gases (or rare gases)	He, Ne, Ar, Kr, Xe, Rn

Chapter 2

- Molecular compounds
- Ionic compounds
- Diatomic elements/molecules.
- H_2, N_2, O_2, F_2, Cl_2, Br_2, I_2,
- Molecular versus empirical formulas
  - Glucose: molecular: $C_6H_{12}O_6$, empirical: CH_2O

Common Cations

Charge	Formula	Name	Formula	Name
1+	*$\mathbf{H^+}$	**Hydrogen ion**	*$\mathbf{NH_4^+}$	**Ammonium ion**
	*Li^+	Lithium ion	*Cu^+	Copper(I) or cuprous ion
	*$\mathbf{Na^+}$	**Sodium ion**		
	*$\mathbf{K^+}$	**Potassium ion**		
	*Cs^+	Cesium ion		
	*$\mathbf{Ag^+}$	**Silver ion**		
2+	*$\mathbf{Mg^{2+}}$	**Magnesium ion**	Co^{2+}	Cobalt(II) or cobaltous ion
	*$\mathbf{Ca^{2+}}$	**Calcium ion**	*$\mathbf{Cu^{2+}}$	**Copper(II)** or cupric ion
	*Sr^{2+}	Strontium ion	*$\mathbf{Fe^{2+}}$	**Iron(II)** or ferrous ion
	*Ba^{2+}	Barium ion	Mn^{2+}	Manganese(II) or manganous ion
	*$\mathbf{Zn^{2+}}$	**Zinc ion**	Hg_2^{2+}	Mercury(I) or mercurous ion
	*Cd^{2+}	Cadmium ion	$\mathbf{Hg^{2+}}$	**Mercury(II)** or mercuric ion
			*Ni^{2+}	Nickel(II) or nickelous ion
			*$\mathbf{Pb^{2+}}$	**Lead(II)** or plumbous ion
			Sn^{2+}	Tin(II) or stannous ion
3+	*$\mathbf{Al^{3+}}$	**Aluminum ion**	*Cr^{3+}	Chromium(III) or chromic ion
			*$\mathbf{Fe^{3+}}$	**Iron(III)** or ferric ion

*The most common ions are in boldface.

*You should know these.

Common Anions

Charge	Formula	Name	Formula	Name
1−	*H^-	Hydride ion	***$C_2H_3O_2^-$**	Acetate ion
	***F^-**	**Fluoride ion**	*ClO_3^-	Chlorate ion
	***Cl^-**	**Chloride ion**	***ClO_4^-**	**Perchlorate ion**
	***Br^-**	**Bromide ion**	***NO_3^-**	**Nitrate ion**
	***I^-**	**Iodide ion**	*MnO_4^-	Permanganate ion
	*CN^-	Cyanide ion	***ClO_2^-**	**Chlorite**
	***OH^-**	**Hydroxide ion**	***ClO^-**	**Hypochlorite**
2−	***O^{2-}**	**Oxide ion**	***CO_3^{2-}**	**Carbonate ion**
	*O_2^{2-}	Peroxide ion	*CrO_4^{2-}	Chromate ion
	***S^{2-}**	**Sulfide ion**	*$Cr_2O_7^{2-}$	Dichromate ion
			***SO_4^{2-}**	**Sulfate ion**
3−	*N^{3-}	Nitride ion	***PO_4^{3-}**	**Phosphate ion**

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*You should know these.

Polyatomic anions

I_3^-	triiodide
O_2^-	Superoxide
OH^-	hydroxide
CN^-	cyanide
SCN^-	thiocyanate
NO_3^-	nitrate
NO_2^-	nitrite
SO_3^{-2}	sulfite
HSO_3^-	bisulfite
SO_4^{-2}	sulfate
HSO_4^-	bisulfate
HCO_3^-	bicarbonate
CO_3^{-2}	carbonate
CH_3CO_2	Acetate

HPO_4^{2-}	hydrogen phosphate
$H_2PO_4^-$	dihydrogen phosphate
PO_4^{-3}	Phosphate
ClO^-	hypochlorite
ClO_2^-	chlorite
ClO_3^-	chlorate
ClO_4^-	perchlorate
MnO_4^-	Permanganate
CrO_4^{-2}	Chromate
$Cr_2O_7^{-2}$	Dichromate

Chap. 2.

- Naming compounds
  - P_2O_5 diphosphorous pentoxide
  - Ammonium acetate $NH_4C_2H_3O_2$
- Naming acids.

Chapter 3, stoichiometry

- Balancing chemical reactions.
- Reaction types
  - precipitation
  - Combustion (especially with hydrocarbons)

  Computations

  Stoichiometric calculations

  limiting reagents

  Yield.

Exam breakdown:

- 1 homogeneous/mixture/etc
- Density problem (buancy)
- (2)Subatomic particles (alpha/beta/ gamma)
- (2)Famous experiments (gold foil cathode ray tube, oil drop)
- Sig figs
- Dimensional analysis
- (2)Periodic table
- (2)Percent composition

Exam breakdown:

Isotope abundance

Naming polyatomic ions/acids (3)

Protons/neutrons/electrons in element

Balance equations

Calculate empirical formula

Calculate percent yield

Limiting reagent.