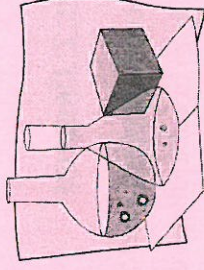


Name Key
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Chemistry Key Terms

These are the vocabulary words that you should know for your final exam.

Chapter 1

atom
conductivity
density
electron
element
mass
neutron
nucleus
proton
subatomic particle

Chapter 2

alkali metals
alkaline earth metals
atomic mass
atomic number
Bohr model
chemical symbol
electron shell
halogens
inert gas
mass number
metal
metalloid
noble gases
non-metal
reactivity
valence electron
valence shell

Chapter 3

chemical formula
chemical name
chemical change
covalent compound
endothermic
exothermic
ionic compound
molecule
multivalent metal
physical change
polyatomic ion

Chemistry Key Concepts

These are the main ideas from Chemistry. Fill-in-the-blanks to complete.

Chapter 1: Atomic Theory

- Warning labels and WHMIS labels identify materials that are risky. (1.1)
- The KMT theory describes matter as made up of tiny particles in constant motion. (1.2) This theory helps to explain the following changes of state:
 - solid \rightarrow liquid: melting liquid \rightarrow solid: solidifying
 - liquid \rightarrow gas: evaporating gas \rightarrow liquid: condensing
 - solid \rightarrow gas: subliming gas \rightarrow solid: depositing
- John Dalton proposed that matter is made of atoms, which can be part of an element (one kind of atom) or a compound (more than one kind of atom joined together). (1.3)
- Ernest Rutherford discovered the nucleus, a tiny, dense region at the centre of an atom. Inside it you will find protons & neutrons. (1.3)
- Most of the volume of an atom is occupied by electrons, which exist in specific orbitals first discovered by Niels Bohr. (1.3)
- Protons have a positive charge, electrons have a negative charge and neutrons are neutral.
- Atomic Number is equal to the number of protons of an element.
- Atomic Mass is the number of neutrons and protons. Mass # is the atomic mass rounded.
- Ions are atoms that have lost or gained electrons.

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Chapter 2: Elements

- Each element contains only 1 kind of atom, and all other forms of matter are made from combinations of these atoms and elements. (2.1)
- The periodic table lists the elements in order of increasing atomic #, arranged into families according to their properties. (2.2)
 - Families (or groups) are arranged vertically & periods are horizontal
 - Families/Groups include:
 - Alkali Metals ex. Li, Na, K
 - Alkaline Earth Metals ex. Be, Mg, Ca
 - Halogens ex. F, Cl, Br
 - Noble Gases [aka Inert gases] ex. He, Ne, Ar

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- In the periodic table, metals are on the left side, non-metals are on the right, and metalloids and semi-conductors form a diagonal line near the right side. (2.2)
- Elements in the same chemical family have the same number of valence electrons in their outermost occupied electron shell. (2.3)
- A Bohr model diagram shows the arrangement of electrons in a specific pattern around the nucleus. (2.3)

Chapter 3: Chemical Bonding and Naming

- A compound is a pure substance made up of two or more different elements in which the atoms are connected. (3.1)
- In molecular compounds, atoms join together by sharing electrons, whereas in ionic compounds, oppositely charged ions attract each other. (3.1)
- In an ionic compound with only two elements, the first ion is always a positive metal ion, and the second ion is always a negative non-metal ion. (3.2)
- A multivalent metal can form an ion in more than one way. Its chemical name includes a roman numeral to indicate the positive ion charge. (3.2)
- Ion charges can be used to write ionic compounds. The number of the charge is criss-crossed and written as a subscript (down, below the line). (3.2)
- Chemical changes produce new substances with new properties, whereas physical changes do not change the identity of a substance. (3.3)
- exothermic chemical reactions release energy and endothermic chemical reactions absorb energy (3.3)

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A. In each of the following, indicate the ELEMENTS present and the NUMBER of each.

1. AlBr_3 Aluminum (1) + Bromine (3)
2. Ag_2S Silver (2) + Sulphur (1)
3. $\text{Zn}_3(\text{PO}_4)_2$ Zinc (3) + Phosphorus (2) + Oxygen (8)
4. NH_4HCO_3 Nitrogen (1) + Hydrogen (5) + Carbon (1) + Oxygen (3)

B. Write the CHEMICAL FORMULA for the following compounds. Use the Criss-cross rule.

Some might need to be reduced.

Some require brackets.

- | | | | |
|--------------------------|--|----------------------------|--|
| 1. Magnesium iodide | <u>MgI_2</u> | 9. Barium phosphate | <u>$\text{Ba}_3(\text{PO}_4)_2$</u> |
| 2. Nickel (II) fluoride | <u>NiF_2</u> | 10. Strontium hydroxide | <u>$\text{Sr}(\text{OH})_2$</u> |
| 3. Cobalt (II) sulphide | <u>CoS</u> | 11. Aluminum hydroxide | <u>$\text{Al}(\text{OH})_3$</u> |
| 4. Iron (III) dichromate | <u>$\text{Fe}_2(\text{Cr}_2\text{O}_7)_3$</u> | 12. Mercury (II) phosphite | <u>$\text{Hg}_3(\text{PO}_3)_2$</u> |
| 5. Hydrogen sulphate | <u>H_2SO_4</u> | 13. Potassium chromate | <u>K_2CrO_4</u> |
| 6. Barium oxide | <u>BaO</u> | 14. Sodium chloride | <u>NaCl</u> |
| 7. Lithium hydroxide | <u>LiOH</u> | 15. Lead (IV) oxide | <u>PbO_2</u> |
| 8. Lead (II) oxide | <u>PbO</u> | 16. Iron (III) oxide | <u>Fe_2O_3</u> |

C. Write the CHEMICAL NAME for the following compounds.

***Endings are "ide" unless a polyatomic (ex. ate/ite) is used.

Some are going to require Roman Numerals.

- | | |
|--------------------------------|----------------------------|
| 1. CaBr_2 | <u>Calcium bromide</u> |
| 2. Cu_3N_2 | <u>Copper (II) nitride</u> |
| 3. Li_2O | <u>Lithium oxide</u> |
| 4. $\text{Zn}(\text{NO}_3)_2$ | <u>Zinc nitrate</u> |
| 5. K_2CrO_4 | <u>Potassium chromate</u> |
| 6. AuCl | <u>Gold (I) chloride</u> |
| 7. HgNO_3 | <u>Mercury (I) nitrate</u> |
| 8. CoO | <u>Cobalt (II) oxide</u> |
| 9. H_2SO_4 | <u>Hydrogen sulphate</u> |
| 10. KBr | <u>Potassium bromide</u> |
| 11. HgO | <u>Mercury (II) oxide</u> |
| 12. $\text{Ca}(\text{OH})_2$ | <u>Calcium hydroxide</u> |
| 13. AgNO_3 | <u>Silver nitrate</u> |
| 14. FeCl_3 | <u>Iron (III) chloride</u> |
| 15. CaCO_3 | <u>Calcium carbonate</u> |
| 16. $\text{Mg}(\text{NO}_3)_2$ | <u>Magnesium nitrate</u> |

D. Identify the following as either chemical changes or physical changes. Give a reason for your choice.

1. an egg is cooked
2. dishes are dried
3. paper is crumpled
4. a match is lit

Chemical
Physical
Physical
Chemical

E. Identify the following chemical reactions as either endothermic or exothermic.

1. endo Cookies are baked.
2. EXO A firecracker explodes.
3. endo Photosynthesis occurs.
4. EXO Fuel burns in a furnace.

Draw the Bohr models of the following elements in each box and then answer the questions that follow. Remember that the first orbit can hold up to 2 electrons, the second and third orbits can have up to 8 electrons, and the rest can hold up to 18 electrons.

Hydrogen	Carbon	Nitrogen	Helium
Lithium	Beryllium	Fluorine	Neon

List the five indicators of a chemical change:

1. Colour Δ
2. bubbles of gas
3. heat Δ
4. difficult to reverse
5. Δ of state.

Draw the following models of the atom and identify the scientist who proposed it:

Billiard Ball Model	Pum Pudding Model	Planetary Model
a. Dalton	b. Thomson	c. Rutherford