

# 200--- Chemistry Final Review Packet

## Concepts

### Day 1

#### Chapter 3-Matter→Properties and Changes

- Define the term intensive property and give examples. (3-1)

Intensive Property→

Examples→

- Know the difference between solutions, pure substances, homogeneous and heterogeneous mixtures. (3-3)

Solution→

EXAMPLE→

Pure Substance→

EXAMPLE→

Homogeneous Mixture→

EXAMPLE→

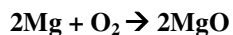
Heterogeneous Mixture→

EXAMPLE→

- Be able to use the Conservation of Mass to explain data collected lab results. (3-2)

What is the CONSERVATION OF MASS?

Given the following reaction and data:



Mass of Container	20.5g
Mass of Mg	1.0g
Mass of O <sub>2</sub>	2.5g
Mass of Products and Container	22.5g
Mass of Products	2.5g

What is wrong with this data?

### Chapter 3-Matter→Properties and Changes (con't)

- Be able to identify a substance as an element, compound or mixture. (3-3)

Illustrate the difference in these 3 substances in terms of atoms.

### Chapter 4-the Structure of the Atom

- Know the Components of Dalton's Theory of Matter. (4-1)

1)

2)

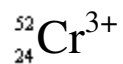
3)

4)

- Know the definition of isotopes. (4-3)

Isotope→

- Be able to interpret Atomic Notation. (4-3)



### Chapter 5-Electrons in the Atom

- Be able to explain the relationship between electron behavior and Energy. (5-1)

What?

## Chapter 6-The Periodic Table and Periodic Law

- Know the common periodic trends as discussed in Chapter 6. (6-3)

Ionization Energy Trend→

Atomic Radius Trend→

Ionic Radius Trend→

Electronegativity Trend→

Electron Affinity Trend→

- Know the 5 physical properties all metals share in common. (6-1)

1)

2)

3)

4)

5)

### Day 2

## Chapter 8-Ionic Compounds

- Be able to name and write formulas Ionic Compounds. (8-3)

Examples→

Write the formula for Calcium Phosphate.

Write the name for  $\text{Pb}(\text{NO}_3)_3$

- Be able to explain how an ionic bond forms. (8-1)

What happens to the atoms of Sr and Cl when they form the compound  $\text{SrCl}_2$ ?

## Chapter 8-Ionic Compounds (con't)

- Know the common properties of ionic compounds. (8-2)

1)

2)

3)

4)

## Chapter 9-Covalent Bonding

- Know how covalently bonded molecules form. (9-1)

What happens to the electrons in a covalently bonded compound like CO<sub>2</sub>?

- Be able to illustrate covalent bonding. (9-1)

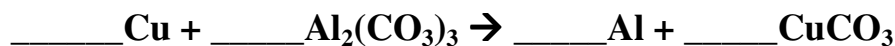
Illustrate the bonding within H<sub>2</sub>O.

## Day 3

## Chapter 10-Chemical Reactions

- Be able to describe, write and balance chemical equations. (10-1)

Balance the following equation:



Write a Word Equation for the balanced equation above.

- Be able to compare/contrast common reaction types to include chemical and nuclear reactions. (10-2 and 25-1)

CHEMICAL RXN → Combustion Reaction →

NUCLEAR RXN → Fission/Fusion Reaction →

## Chapter 10-Chemical Reactions (con't)

- Be able to cite the 5 signs that suggest a chemical reaction has occurred. (10-1)

1)

2)

3)

4)

5)

- Be able to classify equations. (10-2)

Single replacement→

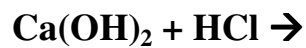
Double replacement→

Synthesis/Combination→

Decomposition→

- Be able to predict products of a chemical reaction when the reactants are given. (10-1)

Complete the following Equations:



### Day 4

## Chapter 11-The Mole

- Be able to determine % composition with formula from memory? (11-4)

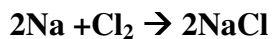
Formula:

Example:        What is the percent composition of Mg in MgSO<sub>4</sub>?

## Chapter 12-Stoichiometry

- Be able to calculate molar conversions. (11-3)

Example: Given the following equation:



How many liters of  $\text{Cl}_2$  gas are needed to form 6.5 g of NaCl?

- Be able to determine limiting reactant and calculate the mass produced for a chemical reaction. (12-3)

Example: Chromium reacts with iron (II) chloride to form iron and chromium (III) chloride.

Write the Balanced Equation.

What is the **LIMITING REACTANT** when 35.0g of Cr are combined with 325ml of 1.00M solution of  $\text{FeCl}_2$ ?

What is the mass of Fe produced?

### Day 5

## Chapter 13-States of Matter

- Be able to list and describe the three IMFs. (13-2)

Hydrogen Bonds→

Dipole-Dipole→

Dispersion Forces→

## Chapter 13-States of Matter (con't)

- Be able illustrate hydrogen bonding. (13-2)

Illustrate the hydrogen bonding within  $\text{H}_2\text{O}$ .

## Chapter 14-Gases

- Know Gay-Lussac's Law from memory and be able to use it in calculations. (14-1)

Formula:

Example: If a tire has a pressure of 245 kPa at  $30.0^\circ\text{C}$ , and the temperature rises to  $60.0^\circ\text{C}$ , what would the new pressure be?

- Be able to solve an Ideal Gas Law problem-formula provided. (14-3)

Formula:

Example: At  $37.9^\circ\text{C}$ , what mass of  $\text{H}_2$  gas is contained in 12.0 L tank at a pressure of 1.6 atm when full?

## Chapter 15-Solutions

- Know the molarity formula from memory and be able to use it in calculations. (15-2)

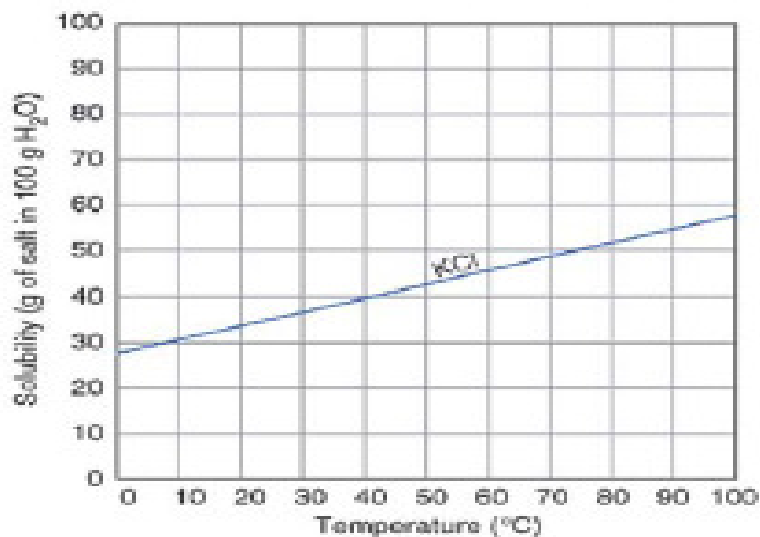
Formula:

Example: How many moles of solute are in 3.5L of a 0.453 M solution of NaCl?

Example: How many grams of solute are needed to make 550.0 ml of a 1.50 M  $\text{CaCl}_2$  solution?

## Chapter 15-Solutions (con't)

- Be able to interpret a Solubility Curve. (15-1)



If you are at 10.0 °C and 30.0g of KCl is dissolved into solution and then you heat the solution to 75.0°C, what can be said about the solution?

### Day 6

## Chapter 16-Energy

- Know definition for endo- and exothermic reactions and be able to identify an equation as which type. (16-2)

Endothermic Reactions→

Exothermic Reactions→

- Be able to solve for heat→ q-formula provided.(16-1)

Formula:

Example: Ca has a specific heat of 0.647J/g · °C. How much energy is needed to raise the temperature of a 350.0g sample of Ca from 30.4 °C to 43.5 °C?

## Chapter 17-Reaction Rates

- Be able to state the factors that will increase the rate of a reaction. (17-2)

1)

2)

3)

4)

## Chapter 18-Chemical Equilibrium

- Know what equilibrium means and how it applies to chemical reactions. (18-1)

Definition→

Application to Reactions→

### Day 7

## Chapter 19-Acids and Bases

- Be able to perform a titration calculation-formula provided. (19-4)

Formula:

Example: A 30.0 ml sample of cyanic acid was titrated. To reach the end point 43.5 ml of .500 M NaOH is required. Determine the molarity of the acid.

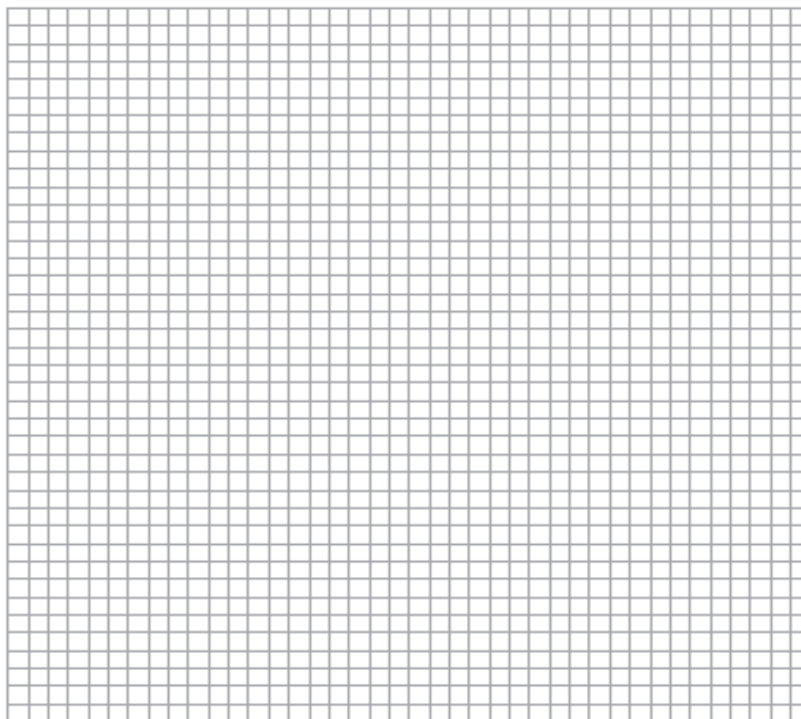
- Be able to read an acid-base reaction with water and determine its role. (19-1)

Water as an ACID→

Water as a BASE→

## Random Graphing Question

- Osmium-190 has a half-life of 4 hours. Draw a mass versus time graph that shows how the mass of a 300. gram sample of Os-190 changes over 24 hours. Be sure to label the axis.



### Format

36-Multiple Choice Questions

7-Open Ended Questions-Short Answer and Calculations

### Included in the Test

A Periodic Table

A Solubility Table

Various Equations as noted on this sheet

Several Polyatomic Ion Names/Symbols

Activity Series

### You Need

A Pencil

A Scientific Calculator