

Summer Work

CHAPTERS 1, 2, 3

Due Date

Summer Work must be completed and turned in on the day of registration: Wednesday, August 15 for 12th graders; Thursday, August 16 for 10th & 11th graders. Failure to do so will result in being dropped from the class. No late work is accepted. *Make copies or take pictures of your work as insurance in case pages get lost.*

Textbook

Zumdahl, *Chemistry*, 9th edition. Textbooks can be picked up from the CCHS library.

Purpose

The purpose of the summer assignment is to get us off to a running start when school begins. The assignment covers all of the topics in the first three chapters of the textbook, most of which are review from first year chemistry. **START NOW** to make your way leisurely through this review. Do not think you should wait until the end of the summer so it is "fresh in your mind." The **LONGER** it is in your mind, the better it will stick.

NOTE: You are expected to send me three separate emails through the course of the summer letting me know when you finish each chapter, and I will send you the worked out solutions and a practice test. I do not expect to get only one email telling me you finished all three chapters on the day before registration.

Assignment

1. Student Information Form (requires ~10 minutes)

- Complete the form at <https://goo.gl/forms/hT0ngwDP6mGcA8fv1>

2. Chapter One (requires ~3 hours)

- Read the entire chapter, pages 1-32. SPEND TIME looking at the pictures and diagrams while reading the captions. Work through the example problems throughout the chapter.
- Problems: p. 34-40 # 27, 28, 30, 32, 34-37, 39, 68, 74, 79, 80, 92, 111, 118 and AP Multiple-Choice Review Questions 1-10 on p.41A/B.
- When you have finished reviewing this chapter and working through the problems, email me a picture(s) of your work, and I will send you the solutions and a chapter 1 practice test.

3. Chapter Two (requires ~4 hours)

- Read the entire chapter, pages 42-72. SPEND TIME looking at the pictures and diagrams while reading the captions. Work through the example problems throughout the chapter.
- Problems: p. 74-79 #29, 34, 38, 39, 41, 54, 59, 62, 68, 72, 76, 77, 78, 84, 86, 87, 88, 102, 114 and AP Multiple-Choice Review Questions 1-16 on p.80A/B.
- When you have finished reviewing this chapter and working through the problems, email me a picture(s) of your work, and I will send you the solutions and a chapter 2 practice test.

4. Chapter Three (requires ~4 hours)

- Read the entire chapter, pages 81-125. SPEND TIME looking at the pictures and diagrams while reading the captions. Work through the example problems throughout the chapter.
- Problems: p. 129-132 #52, 54, 56, 68, 74, 76, 81, 86, 90, 96, 101, 106, 112, 115, 120, 122, 124, 126 and AP Multiple-Choice Review Questions 1-17 on p.137A/B.
- When you have finished reviewing this chapter and working through the problems, email me a picture(s) of your work, and I will send you the solutions and a chapter 3 practice test.

*******Turn in ALL WORK (textbook problems & practice tests) at Registration (August 15th or 16th)*******

5. Memorization (requires ??? hours)

Get started memorizing the common ions, polyatomic ions, strong acid formulas, strong base formulas, and solubility rules. Make your own flash cards if that will help you. **You will be quizzed on the first day of school.**

MEMORIZATION

A. Common Ions - memorize

Learn the names and charges of the common cations and anions found on Table 2.3 and Table 2.4 on pp. 61-62 of your textbook. The position of the ions on the Periodic Table are shown in Figure 2.21 on p. 65.

B. Common Polyatomic Ions - memorize

Memorize the names and charges of the Common Polyatomic Ions on Table 2.5, p. 65 of your textbook.

They are listed below by name and pattern: One less oxygen (same charge) turns the name to *-ite*, **and** two less oxygens (if possible) turns the name to *hypo-xxx-ite* **and** one more oxygen (if possible) turns the name to *per-xxx-ate*

hypo- (2 less O)		-ite (1 less O)		-ate		per- (1 more O)	
		nitrite	NO_2^-	nitrate	NO_3^-		
		sulfite	SO_3^{2-}	sulfate	SO_4^{2-}		
		bisulfite	HSO_3^-	bisulfate	HSO_4^-		
		phosphite	PO_3^{3-}	phosphate	PO_4^{3-}		
		hydrogen phosphite	HPO_3^{2-}	hydrogen phosphate	HPO_4^{2-}		
		dihydrogen phosphite	H_2PO_3^-	dihydrogen phosphate	H_2PO_4^-		
hypochlorite	ClO^- or OCl^-	chlorite	ClO_2^-	chlorate	ClO_3^-	perchlorate	ClO_4^-
hypobromite	BrO^-	bromite	BrO_2^-	bromate	BrO_3^-	perbromate	BrO_4^-
hypoiodite	IO^-	iodite	IO_2^-	iodate	IO_3^-	periodate	IO_4^-

Odd Companions or No Companions			
peroxide	O_2^{2-}		
hydroxide	OH^-		
cyanide	CN^-	thiocyanate	SCN^- or NCS^-
acetate	$\text{C}_2\text{H}_3\text{O}_2^-$		
carbonate	CO_3^{2-}	bicarbonate	HCO_3^-
chromate (yellow)	CrO_4^{2-}	dichromate (orange)	$\text{Cr}_2\text{O}_7^{2-}$
permanganate (purple)	MnO_4^-		
oxalate	$\text{C}_2\text{O}_4^{2-}$		

Cations	
mercury(I)	Hg_2^{2+}
ammonium	NH_4^+
hydronium	H_3O^+

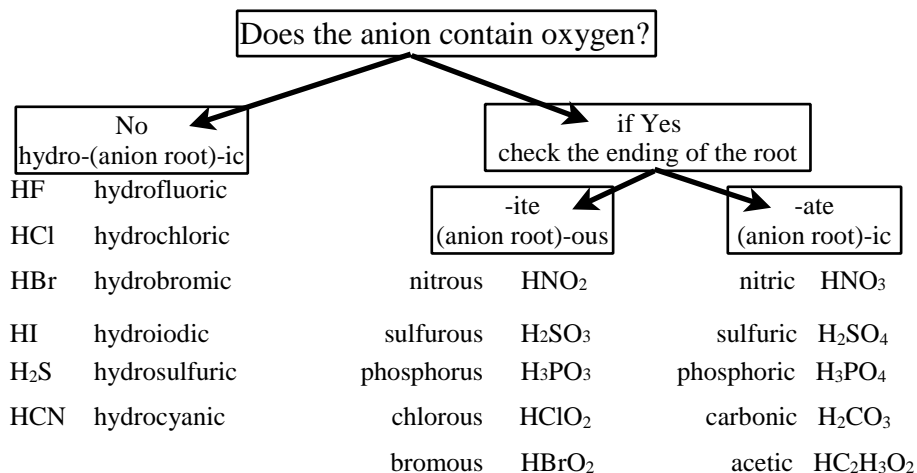
C. Acids - memorize

Memorize the names and formulas for the 8 strong acids. Learn the pattern for naming acids.

HCl	hydrochloric acid	HClO ₃	chloric acid	HClO ₄	perchloric acid
HBr	hydrobromic acid				
HI	hydroiodic acid			HIO ₄	periodic acid
HNO ₃	nitric acid				
H ₂ SO ₄	sulfuric acid				

Demystifying the Naming of Acids

(refer to page 69 – 70 in your textbook)



D. Bases - memorize

Memorize the names and formulas for the 7 strong bases. Notice the pattern: alkali metal ions (Li⁺, Na⁺, K⁺, Rb⁺, Cs⁺) and Ca²⁺, Ba²⁺, Sr²⁺ (“CBS”) form strong bases with hydroxide, OH⁻.

LiOH	lithium hydroxide	Ca(OH) ₂	calcium hydroxide
NaOH	sodium hydroxide	Sr(OH) ₂	strontium hydroxide
KOH	potassium hydroxide	Ba(OH) ₂	barium hydroxide
RbOH	rubidium hydroxide		
CsOH	cesium hydroxide		

E. Solubility Rules – memorize

ALWAYS SOLUBLE IF IN A COMPOUND	EXCEPT WITH
Alkali metal ions (Li ⁺ , Na ⁺ , K ⁺ , Rb ⁺ , Cs ⁺) and NH ₄ ⁺	No exceptions
NO ₃ ⁻ , C ₂ H ₃ O ₂ ⁻ , ClO ₃ ⁻ , ClO ₄ ⁻ , HCO ₃ ⁻	No exceptions
Cl ⁻ , Br ⁻ , I ⁻	Ag ⁺ , Pb ²⁺ , Hg ₂ ²⁺ (mnemonic: AP/H)
F ⁻	Ca ²⁺ , Ba ²⁺ , Sr ²⁺ , Pb ²⁺ , Mg ²⁺ (mnemonic: CBS/PM)
SO ₄ ²⁻	Ca ²⁺ , Ba ²⁺ , Sr ²⁺ , Ag ⁺ , Pb ²⁺ (mnemonic: CBS/AP)

If a substance does not fit one of the 5 rules above, assume it is **INSOLUBLE** and should be written as a **MOLECULE** (not ionized). This isn't perfect but will cover most situations, unless you are given other information in the question to help you determine if the substance is soluble or not.