

CHEM 101-080 Fall 2004
Problem-Solving Session 2
September 27, 2004

1. Give the location and examples of elements for each family. (Sec. 4-3, 4-4)

Family	Location	Example elements
Group 1		
Alkali metals		
Alkaline earth metals		
Group 2		
Halogens		
Chalcogens		
Group 3		
Lanthanides		
Actinides		
Group 4		
Transition metals		
Metalloids		
Group 5		
Noble gases		
Semimetals		

2. Name each anion and write the formula of each corresponding acid. (Sec. 4-8)

Anion	Name of anion	Name of Acid	Formula of Acid
Group 1			
NO_3^-			
SO_4^{2-}			
I^-			
Cl^-			
Group 2			
PO_4^{3-}			
NO_2^-			
BO_3^{2-}			
F^-			
Group 3			
ClO_4^-			
ClO_3^-			
$\text{C}_2\text{O}_4^{2-}$			
Br^-			
Group 4			
$\text{C}_2\text{H}_3\text{O}_2^-$			
MnO_4^-			
$\text{Cr}_2\text{O}_7^{2-}$			
Group 5			
CO_3^{2-}			
S^{2-}			
SO_3^{2-}			

3. Name the following compounds using the Stock method where appropriate. (Sec. 4-5)

Compound	Name
Group 1	
CrSO ₄	
Al ₂ (SO ₃) ₃	
Group 2	
Fe(CN) ₂	
(NH ₄) ₂ CO ₃	
Group 3	
RbHCO ₃	
NH ₄ NO ₃	
Group 4	
Bi(OH) ₃	
FeSO ₄	
Group 5	
FeCl ₃	
Mn(ClO ₄) ₂	

4. Name the following compounds using the Stock method where appropriate. (Sec. 4-5)

Compound	Name
Group 1	
NaCl	
Na ₂ SO ₄	
Mg ₂ C ₂ O ₄	
FeC ₂ O ₄	
Group 2	
KI	
Cs ₂ CO ₃	
MnCO ₃	
NiCl ₂	
Group 3	
HgCrO ₄	
Hg ₂ CrO ₄	
CaCrO ₄	
MoCl ₄	
Group 4	
K ₂ CO ₃	
AlN	
TiN	
RhCl ₃	
Group 5	
TiS ₂	
TiS	
ZnSe	
ZrI ₄	

5. Write formulas for the following compounds. (Sec. 4-5)

Compound	Name
Group 1	
Zirconium dibromide	
Zirconium (IV) bromide	
Iron (II) iodide	
Bismuth (II) sulfide	
Group 2	
Cobalt (II) chloride	
Copper (II) bromide	
Cobalt (III) acetate	
Calcium oxide	
Group 3	
Calcium sulfate	
Iron (II) acetate	
Iron (II) sulfite	
Magnesium selenide	
Group 4	
Palladium (II) chloride	
Potassium bromate	
Potassium carbonate	
Ruthenium (V) fluoride	
Group 5	
Tin (II) oxide	
Tin (IV) sulfide	
Sodium sulfate	
Sodium nitrite	

6. Chapter 5 HW

Problem	Answer	Problem	Answer
Group 1		Group 4	
5-4		5-68	(a) (b) (c) (d)
5-25	(a) (b) (c) (d) (e) (f)		
Group 2		Group 5	
5-35 write orbital diagrams on classroom whiteboard	(a) (b) (c) (d)	5-74	
Group 3		Group 6	
5-47	(a) (b) (c) (d) (e) (f)	5-76	

7. Ch. 5 - For each ion, write the electron configuration using the noble gas core notation. Write also the formula and name of the compound formed by each pair of ions. Explain the pattern that develops in the electron configuration of these common ions.

Ion	Electron Configuration	Formula & Name
Group 1		
Se ²⁻		
Cs ⁺		
Group 2		
Br ⁻		
Li ⁺		
Group 3		
O ²⁻		
Ca ²⁺		
Group 4		
N ³⁻		
Sr ²⁺		
Group 5		
S ²⁻		
Al ³⁺		
Group 6		
Cl ⁻		
Be ²⁺		

8. Ch. 5 - Write an orbital diagram for each atom and ion.

Ion	Orbital Diagram
Group 1	
O	
O ²⁻	
Group 2	
B	
B ²⁻	
Group 3	
C	
C ⁻	
Group 4	
N	
N ²⁻	
Group 5	
Mg	
Mg ²⁺	

9. Ch. 15 - Radiation

Group 1: Problem 23

Group 2: Problem 24

Group 3: Problem 25