

Chemistry 68 – Exam 2
13 January 2010

Name _____

Show all work for full credit. Answers without supporting work will receive zero credit.

1. (7 points) Calculate the **relative average atomic mass** of an element that has three isotopes. The following data is given:

Isotope Mass	Abundance
357.903435 amu	24.67%
359.903392 amu	58.04%
362.902995 amu	17.29%

$$(357.903435 \text{ amu})(0.2467) + (359.903392 \text{ amu})(0.5804) + (362.902995 \text{ amu})(0.1729) \\ = 359.9286339668 \text{ amu} = 359.9 \text{ amu}$$

2. (10 points) Textbook Problem 5.97 – Copper consists of two naturally occurring isotopes with masses of 62.9298 amu and 64.9278 amu.

a. How many protons are in the nucleus of each isotope?

29

b. How many electrons are in an atom of each isotope?

29

c. How many neutrons are in the nucleus of each isotope?

34 in the lighter one, 36 in the other

3. (18 points) Complete the following table.

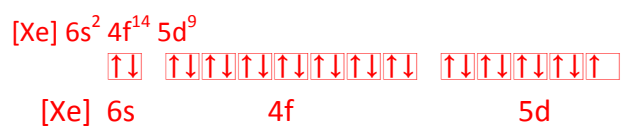
Name of Element	Symbol
Aluminum	Al
Boron	B
Nitrogen	N
Neon	Ne
Iodine	I
Selenium	Se
Palladium	Pd
Cobalt	Co
Argon	Ar
Zirconium	Zr
Titanium	Ti
Gold	Au

4. (21 points) Complete the following table:

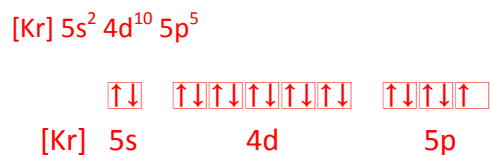
Name of Element	Isotope symbol	Mass Number	Atomic Number	Number of Protons	Number of Neutrons	Number of Electrons
Carbon	$^{14}_6\text{C}$	14	6	6	8	6
Manganese	$^{56}_{25}\text{Mn}$	56	25	25	31	25
Platinum	$^{195}_{78}\text{Pt}$	195	78	78	117	78
Tellurium	$^{128}_{52}\text{Te}$	128	52	52	76	52

5. (12 points) Write **electron configurations** and **orbital diagrams** for the following elements using the noble gas shorthand:

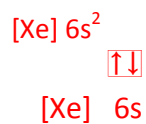
a. Gold



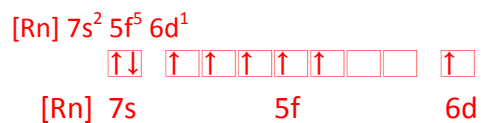
b. Iodine



c. Barium

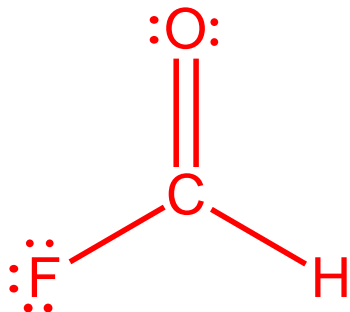


d. Plutonium



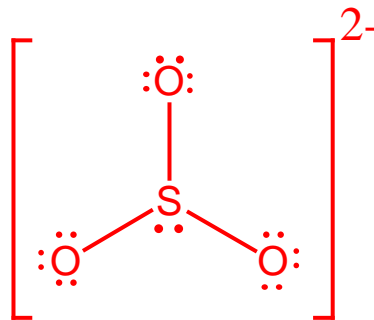
6. (12 points) Draw **electron dot structures** for the following compounds. For any compound that contains a covalent structure, give the **electron pair geometry**, the **molecular geometry**, state whether or not it is **polar**, state if the compound has **resonance structures**.

a. CHOF



EPG : Trigonal Planar
MG: Trigonal Planar
Polar
No resonance

b. SO_3^{2-}



EPG: Tetrahedral
MG: Trigonal Pyramidal
polar
no resonance

7. (10 points) Write formulas for the following compounds.

a. Cobalt(II) Hypochlorite



b. Disulfur Trioxide



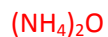
c. Sodium Selenide



d. Triphosphorus Tetrabromide



e. Ammonium Oxide



f. Perchloric acid



g. Nitrogen Trioxide



h. Hydrocyanic acid



i. Lithium Peroxide



j. Calcium Permanganate



9. (10 points) Write names for the following compounds.

a. CuBr

Copper(I) Bromide

b. NpS₃

Neptunium(VI) Sulfide

c. K₂O₂

Potassium Peroxide

d. HI_(aq)

Hydriodic acid

e. H₂SO_{3(aq)}

Sulfurous acid

f. Ag₂CrO₄

Silver Chromate

g. Rh(SO₃)₂

Rhodium(IV) Sulfite

h. LiF

Lithium Fluoride

i. NBr₃

Nitrogen Tribromide

j. Cl₂l₃

Dichlorine Triiodide