Chemistry 0094 R10
Fall 2000
Test #2

Wednesday, October 25, 2000 Time: 2 hours

Name: _____ Student Number: _____

*This exam consists of **six** pages of questions, a periodic table, and a sheet containing the symbols, masses, and names of the elements. Please ensure that you have a complete paper and, if you do not, obtain one from me **immediately**. Good luck!*

1) **[5 marks]** A certain element occurs naturally as five different isotopes. Use this information and the data provided in the table below to complete the rest of the table.

Nuclide Symbol	Mass (amu)	Percent Abundance
	45.9526	8.25
	46.9518	7.44
	47.9479	
	48.9479	5.41
	49.9448	5.18

[20 marks] Name the following compounds:

a) Al_2O_3 _____

b) Ca_3N_2 _____

c) $PbBr_2$ _____

d) CuI _____

e) Cs_2SO_3 _____

f) $AgBrO_4$ _____

g) Na_2SeO_3 _____

h) NH_4NO _____

i) $H_2SO_2(aq)$ _____

j) $H_3P(aq)$ _____

k) $Os(OH)_3$ _____

l) $Ca(OH)_2$ _____

m) HF(g) _____

n) SO_2 _____

o) BrF_3 _____

p) SF_6 _____

q) CBr_4 _____

r) F_2O _____

s) $Na_2CO_3 \cdot 9H_2O$ _____

t) $Fe(ClO)_3 \cdot 8H_2O$ _____

2) **[20 marks]** Give the formula for the compounds which have the following names. Indicate phases where necessary.

a) sodium sulphide _____

b) iron(III) phosphite _____

c) aluminum hyponitrite _____

d) silver(I) bromate _____

e) nickel(III) carbonate dihydrate _____

f) periodic acid _____

g) tin(II) hydroxide _____

h) hydroiodic acid _____

i) tetraphosphorus decoxide _____

j) carbon tetrabromide _____

k) barium oxide _____

l) copper(I) selenide _____

m) indium hypophosphite _____

n) mercury(II) oxide _____

o) iron(II) selenite pentahydrate _____

p) hydrogen sulphide _____

q) potassium hydroxide _____

r) dinitrogen monoxide _____

s) argon difluoride _____

t) zirconium(III) sulphide _____

3) **[8 marks]** Assume that each of the following reactions occurs and provide the formulae for the products formed. **Do not balance the equations or indicate the phases of the products**.

a) $CaCl_2 + AgNO_3 \longrightarrow$

b) $Co(NO)_3 + Ca(OH)_2 \longrightarrow$

c) $K_2SeO_2 + Cu_2S \longrightarrow$

d) $Ti(SO_4)_2 + Ba_3P_2 \longrightarrow$

e) $HNO_2 + Al_2(SO_3)_3 \longrightarrow$

f) $Al + O_2 \longrightarrow$

g) $NaBr + Cl_2 \longrightarrow$

h) $Mg + HCl \longrightarrow$

4) **[8 marks]** Balance each of the following reactions.

a) $\_\_\_Ca(NO_3)_2 + \_\_\_Fe(OH)_3 \longrightarrow \_\_\_Ca(OH)_2 + \_\_\_Fe(NO_3)_3$

b) $\_\_\_H_2SO_4 + \_\_\_Ti(OH)_4 \longrightarrow \_\_\_Ti(SO_4)_2 + \_\_\_H_2O$

c) $\_\_\_CaCl_2 + \_\_\_Na_3P \longrightarrow \_\_\_Ca_3P_2 + \_\_\_NaCl$

d) $\_\_\_C_6H_8O_6 + \_\_\_O_2 \longrightarrow \_\_\_CO_2 + \_\_\_H_2O$

e) $\_\_\_Na_3PO_2 + \_\_\_CuNO_3 \longrightarrow \_\_\_NaNO_3 + \_\_\_Cu_3PO_2$

f) $\_\_\_AlBr_3 + \_\_\_Cl_2 \longrightarrow \_\_\_AlCl_3 + \_\_\_Br_2$

g) $\_\_\_Al + \_\_\_O_2 \longrightarrow \_\_\_Al_2O_3$

h) $\_\_\_H_2SeO_4 + \_\_\_Al(OH)_3 \longrightarrow \_\_\_H_2O + \_\_\_Al_2(SeO_4)_3$

5) **[8 marks]** Complete and balance the following equations. Indicate the phases of all products. If you do not expect a reaction to occur, write "NR" to the right of the arrow. Provide only the balanced molecular equation. Assume that all products are at room temperature.

a) ___$Cl_2(aq)$ + ___$KI(aq)$ $\longrightarrow$

b) ___$VCl_3(aq)$ + ___$NaNO_3(aq)$ $\longrightarrow$

c) ___$FeCl_3(aq)$ + ___$Na_2S(aq)$ $\longrightarrow$

d) ___$C_4H_{10}O_3(s)$ + ___$O_2(g)$ $\longrightarrow$

e) ___$CaCO_3(s)$ $\xrightarrow{\Delta}$

f) ___$Ca(s)$ + ___$HClO_4(aq)$ $\longrightarrow$

g) ___$Ga(s)$ + ___$S_8(s)$ $\longrightarrow$

h) ___$MgS(s)$ + ___$HNO_3(aq)$ $\longrightarrow$

6) **[2 marks]** Which of the reactions in question 5 is/are:

Single Displacement	5(a)	5(b)	5(c)	5(d)	5(e)	5(f)	5(g)	5(h)
Double Displacement	5(a)	5(b)	5(c)	5(d)	5(e)	5(f)	5(g)	5(h)
Decomposition	5(a)	5(b)	5(c)	5(d)	5(e)	5(f)	5(g)	5(h)
Combustion	5(a)	5(b)	5(c)	5(d)	5(e)	5(f)	5(g)	5(h)
Combination	5(a)	5(b)	5(c)	5(d)	5(e)	5(f)	5(g)	5(h)

7) **[2 marks]** A 50.00 mL sample of solution **A** (concentration 50.00 g KCl/L) was taken and diluted to 500.0 mL to form solution **B**. What is the concentration (in g/L) of solution **B**?