

Quiz: Ch 3 & 4
Version I (32 pts)
AP Chem

Name:
September 16, 2004
Period: 5 6 7

Show your work for all questions; answer all parts of all questions. No work = no credit.

1. (8 pts) When aluminum metal is heated with an element from Group 6A of the periodic table, a binary ionic compound forms. When the experiment is performed with an unknown Group 6A element, the product is 18.56% Al by mass. What is the formula of the compound?

Ans =

2. (12 pts) You have two 500.0 mL aqueous solutions – one of silver nitrate and one of potassium chromate. The masses of the solutes in each of the solutions are the same. When the solutions are added together, a red precipitate forms. After the reaction has gone to completion, you dry the solid and find that it has a mass of 331.8 g.
 - a. Calculate the molarity of the potassium ions in the original potassium chromate solution.

Ans =

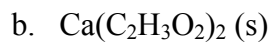
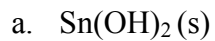
- b. Calculate the molarity of the original silver nitrate solution.

Ans =

3. (12 pts) Label each of the following compounds as S (for soluble) or I (for insoluble) in water.

Then,

- For the insoluble (I) compounds, write an example of a *molecular equation* of a precipitation reaction showing how the insoluble compound could be produced.
- For the soluble (S) compounds, write a brief statement explaining how you knew it was soluble.



Quiz: Ch 3 & 4
Version J (32 pts)
AP Chem

Name:
September 16, 2004
Period: 5 6 7

Show your work for all questions; answer all parts of all questions. No work = no credit.

1. (8 pts) When magnesium metal is heated with an element from Group 5A of the periodic table, a binary ionic compound forms. When the experiment is performed with an unknown Group 5A element, the product is 54.06% Mg by mass. What is the formula of the compound?

Ans =

2. (12 pts) You have two 500.0 mL aqueous solutions – one of lead (II) acetate and one of sodium chromate. The masses of the solutes in each of the solutions are the same. When the solutions are added together, a yellow precipitate forms. After the reaction has gone to completion, you dry the solid and find that it has a mass of 484.8 g.
 - a. Calculate the molarity of the acetate ions in the original lead (II) acetate solution.

Ans =

- b. Calculate the molarity of the original sodium chromate solution.

Ans =

3. (12 pts) Label each of the following compounds as S (for soluble) or I (for insoluble) in water.

Then,

- For the insoluble (I) compounds, write an example of a *molecular equation* of a precipitation reaction showing how the insoluble compound could be produced.
- For the soluble (S) compounds, write a brief statement explaining how you knew it was soluble.

a. $\text{CuI}_2(\text{s})$

b. $\text{Hg}_2\text{Cl}_2(\text{s})$

c. $\text{BaS}(\text{s})$

Show your work for all questions; answer all parts of all questions. No work = no credit.

1. (8 pts) Sterling silver, an alloy of silver and copper, contains 7.5% copper by mass and has a density of 10.3 g/cm^3 . How many copper atoms (by mass) are in a sterling silver sphere with a radius of 2.0 in? ($V_{\text{sphere}} = \frac{4}{3} \pi r^3$)

Ans =

2. (12 pts) Give the molecular and net ionic equations for each of the following chemical reactions. Each of the reactions occurs in aqueous solution unless otherwise indicated.
- a. A solution of mercury (II) acetate is mixed with a solution of strontium carbonate.

Molecular:

Net ionic:

- b. A solution of stannic phosphate is mixed with a solution of barium fluoride.

Molecular:

Net ionic:

- c. A solution of cesium hydroxide is mixed with a solution of plumbic sulfate.

Molecular:

Net ionic:

3. (6 pts) You have two 500.0 mL aqueous solutions – one of 0.500 M calcium hydroxide and one of sulfuric acid.
- What molarity of sulfuric acid (500.0 mL) would be required to neutralize the calcium hydroxide solution?

Ans =

- What molarity of sulfuric acid (500.0 mL) would be required to neutralize the calcium hydroxide solution and create a combined solution that is 0.100 M SO_4^{2-} ?

Ans =