

INFORMATION, SCRAP, AND COVER PAGE***** KEEP YOUR WORK AND YOUR ANSWERS COVERED *****

This page contains information which may or may not be needed. This page can also be used for scrap paper or for cover paper. **THIS PAGE WILL NOT BE COLLECTED. TEAR THIS PAGE OFF THE EXAM.**

SOLUBILITY TRENDS

For purposes of this course, we will use the following trends to predict whether a compound is soluble or insoluble. These guidelines are given in a priority sequence: use them in this order.

1. Group 1 compounds and ammonium compounds tend to be soluble.
2. Nitrates, acetates, chlorates, and perchlorates tend to be soluble.
3. Silver, lead, mercury(I) and copper(I) compounds tend to be **INSOLUBLE**.
4. Chlorides, bromides, and iodides tend to be soluble.
5. Sulfates tend to be soluble except calcium sulfate, strontium sulfate and barium sulfate.
6. Compounds with anions of 2- or 3- charge tend to be **INSOLUBLE**.
7. Hydroxides tend to be **INSOLUBLE** except calcium hydroxide, strontium hydroxide and barium hydroxide.

PRINT NAME _____

SIGN NAME _____

CIRCLE your recitation section in the list below.

5: W 12:00 LF 102

6: Th 8:00 HM 209

7: F 10:00 HM 108

8: W 2:00 HM 106

9: Th 9:00 HM 215

10: F 1:00 HM 209

11: M 1:00 HM 101

SCORED GRADE: _____

All answers should be with the correct significant figures.

Atomic weights are provided in the Periodic Table. These values must be used.

The Periodic Table and Information Page will not be collected. They may be used as scratch paper or as cover paper. Do not turn them in. If you wish to check your answers against the key, you can copy your answers to those pages.

Be certain your answers are clear. If an answer is not clear, it can be considered wrong.

Problems marked with ** in the margin are from the assigned homework. These total 28 points.

Place your name in the space provided at the top of each question page. This helps to identify the pages if they are accidentally separated during grading and processing.

Work promptly. Use your time effectively.

****KEEP YOUR WORK AND ANSWERS COVERED.****

1. (24 pts) Indicate whether each statement is true (T) or false (F). Be certain T or F is clearly indicated.

- _____ A 70% yield means the theoretical yield is less than the actual yield.
- _____ The bonds in a water molecule are polar covalent bonds.
- _____ In the reaction of sodium chloride and lead(II) nitrate, Na^+ and NO_3^- are the (only) spectator ions.
- _____ Both H_3O^+ and H_5O_2^+ are present in an acid solution in water.
- _____ Water can completely dissociate molecules of hydrogen fluoride.
- _____ Nitrous acid is a strong electrolyte.
- _____ CO_2 is a base.
- _____ A redox reaction is any reaction which involves a change in oxidation numbers.

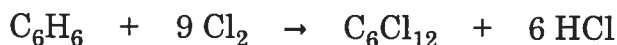
- ** 2. (6 pts) Give the oxidation number of each element in CaSeO_3 .

Ca: _____ Se: _____ O: _____

3. (6 pts) Consider mixing the separate solutions as given for each entry below. If the mixing will result in a precipitation, write P. If the mixing will result in an acid-base reaction, write AB. If the mixing will result in a gas-forming reaction, write GF. If there is no reaction upon mixing, write NR. (There is no balancing requirement for this question.)



- ** 4. (6 pts) The following equation is balanced.

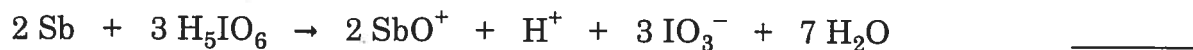
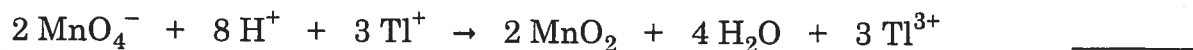


The reaction is conducted beginning with 4.496 g C_6H_6 and excess Cl_2 . The actual yield of HCl is 11.4 g. Circle the percent yield.

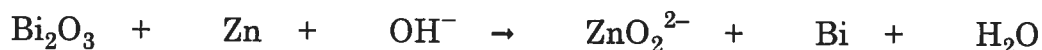
- | | | | | | |
|-------|-------|-------|-------|-------|-------|
| 81.3% | 82.8% | 83.0% | 84.9% | 85.6% | 86.3% |
| 87.2% | 88.9% | 89.5% | 90.5% | 91.2% | 92.8% |

last name: _____

- ** 5. (6 pts) Each of the following equations is balanced. For each reaction as written, how many electrons are transferred (lost or gained)? Place your answer in the spaces to the right.



6. (6 pts) Balance the following equation. All reactants and products are shown.



- ** 7. (5 pts) Write the balanced, undissociated equation for the aqueous reaction of H_3PO_4 with excess KOH. Place your final answer on the line below.

8. (3 pts) Give the formula of chloric acid. _____

(3 pts) Give the formula of the precipitate in the reaction of chromium(III) nitrate and sodium phosphate. _____

9. (5 pts) A 500.0 mL solution of magnesium perchlorate contains 0.58 g of that salt. Circle the value for $[\text{ClO}_4^-]$ (in M).

0.0041	0.0052	0.0068	0.0077	0.0082	0.0092
0.010	0.011	0.012	0.013	0.014	0.015

- ** 10. (5 pts) Write the net ionic equation for the reaction of $\text{AgNO}_3(aq)$ with $\text{ZnBr}_2(aq)$. Place your final answer on the line below. (Phases are not needed.)
