last name: F18 201-03 ExII

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.

F Water can break up magnesium nitrate into separate Mg^{2+}, N^{3-} and O^{2-} ions.

T Copper(II) sulfate dissolves and dissociates in water to a significant extent.

F Water can protonate hydrogen bromide.

F HClO dissociates completely when dissolved in water.

T Sodium oxide is a strong base.

T Arsenic acid is an oxyacid.

T In a redox reaction, the oxidant is reduced.

F Br^- ions can be formed by the oxidation of Br_2.

2. (5 pts) The following equation is balanced.

$$5\ Cl_2(g) + S_2Cl_2(l) + 8\ H_2O(l) \rightarrow 2\ H_2SO_4(l) + 12\ HCl(g)$$

Consider a reaction using 15.4 mL S_2Cl_2 (density = 1.69 g/mL). After all workup steps are completed, an actual yield of 61.8 g HCl is obtained. Circle the percent yield for this process.

50.6%	54.3%	58.2%	60.9%	63.1%	67.8%
(73.3%)	76.0%	79.2%	81.9%	85.5%	87.2%

** 3. (5 pts) Consider the following equation.

$$8\ V^{2+} + 3\ IO_6^{5-} + 4\ H^+ \rightarrow 8\ VO_2^+ + 3\ I^- + 2\ H_2O$$

Which reactant loses electrons? V^{2+}

What is the oxidant? IO_6^{5-}

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

$$3\ KOH(aq) + H_3AsO_4(aq) \rightarrow K_3AsO_4(aq) + 3\ H_2O(l)$$

Circle the volume (in mL) of 0.550 M KOH which is required in order to make 11.8 g K_3AsO_4.

211	(251)	272	309	367	385
430.	452	486	504	537	588

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5. (6 pts) Consider mixing the separate, aqueous solutions as given for 'a' and 'b' 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. (You do not have to balance the equations.)

a. $HgCl_2 + Ca(ClO_3)_2$ NR

b. $KHSO_3 + HF$ GF

** 6. (3 pts) Give the formula of carbonic acid. H_2CO_3

(3 pts) Give the formula of the salt which is produced in the reaction of HNO_3 and LiOH. $LiNO_3$

7. (6 pts) For each compound below, give the oxidation number of the underlined atom.

$H_3\underline{P}O_2$ 1 $(NH_4)_2\underline{Cr}O_4$ 6 $H_6\underline{Te}O_6$ 6

** 8. (6 pts) Consider the reaction of sodium hydroxide and hydrocyanic acid. Write the balanced equation in net ionic format. (You can leave out phases.) Put your final answer in the box below. Only that will be graded.

$$OH^- + HCN \longrightarrow CN^- + H_2O$$

** 9. (5 pts) Circle the molarity of a solution which contains 15.7 g barium chloride in a volume of 250.0 mL.

0.0543	0.0702	0.0911	0.149	(0.302)	0.552
0.733	0.960	1.12	1.38	1.59	1.74

10. (3 pts) List the spectator ion(s) for the reaction of silver sulfide and perchloric acid. ClO_4^-

(3 pts) Give the formula of the precipitate formed in the reaction of manganese(II) acetate and lithium carbonate. $MnCO_3$