

Quiz 3B
11 points

Name KEY
Maleckar/960/Fall 2009

1. Write and balance the combustion reaction that occurs when acetylene, C_2H_2 , is burned.



2pts: writing the rxn.
2pts: balancing

2. You place a 35ml sample of 5.3M HNO_3 in 250ml of water. What is the molarity of this new solution?

$$\left(\frac{5.3 \text{ moles}}{L}\right)(.035L) = \frac{0.1855 \text{ moles}}{.250L} = .742M$$

3pts.

$$M_1V_1 = M_2V_2$$

$$(5.3)(35) = M_2(250)$$

$$M_2 = .742M$$

3. The following reaction generates $NaClO$, the active ingredient in bleach.



You react 50ml of 3.2M $NaOH$ with excess chlorine. What is the maximum yield of $NaClO$ in grams?

$$\left(\frac{3.2 \text{ moles}}{L}\right)(.050L) = 0.16 \text{ moles } NaOH$$

$$(0.16 \text{ moles } NaOH) \left(\frac{1 \text{ mole } NaClO}{2 \text{ moles } NaOH}\right) \left(\frac{74.45g}{\text{mole } NaClO}\right) = 5.96g \text{ } NaClO$$

4pts.

Quiz 3C
11 points

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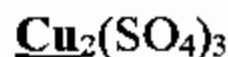
1. Give the oxidation number of the atom underlined in each compound.



↓
+7 1 pt

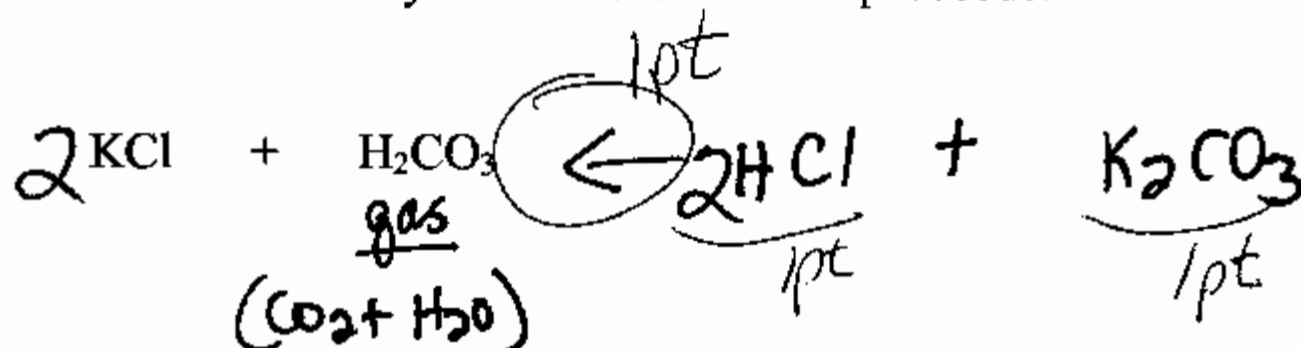


+4 1 pt



+3 1 pt

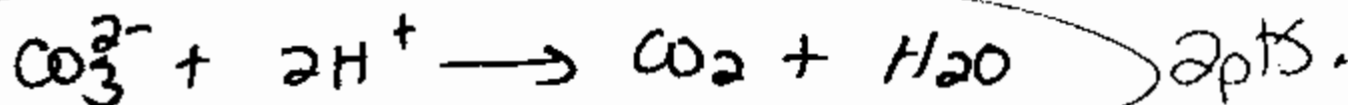
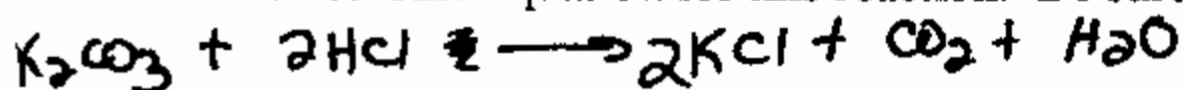
2. Using these two compounds as either products or reactants, complete the following metathesis reaction. Be sure to draw the reaction arrow either to the left or to the right, depending on which direction you think the reaction proceeds.



What is the driving force behind this reaction, if there is one?

formation of a gas 1 pt

Write the net ionic equation for this reaction. Be sure to write it in the correct direction.



3. You dilute 12 mL of a 0.75 M HCl solution to 75 mL with water. What is the concentration of the new solution?

$(12)(.75) = (75)X$

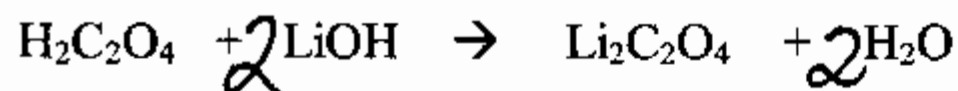
$X = 0.12\text{M}$

2 pts.

Quiz 3D
11 points

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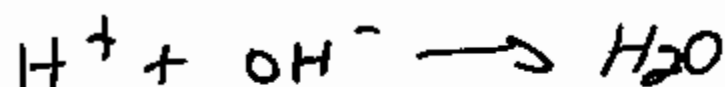
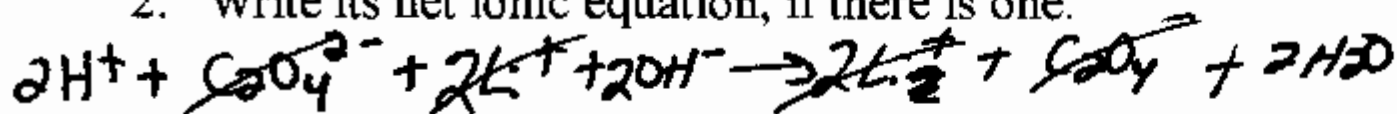
1. What type of reaction is this?



- A. precipitate driven B. gas driven
C. redox D. combustion
E. neutralization F. no net reaction

2pts.

2. Write its net ionic equation, if there is one.



2pts.

3. You want to make 450 ml of 2.0M H_2SO_4 from a 12.1M stock solution. How many ml of the stock solution should you add to water and dilute to 450ml?

$$(12.1) X = (2.0)(450)$$

$$X = 74.4 \text{ ml}$$

2pts.

4. If you react 4.5g of HCl with 5.8g of CaCO_3 according to the reaction below, what is the limiting reagent and what is the theoretical yield of CaCl_2 ?



MW 36 100 110

$$(4.5 \text{ g}) \left(\frac{\text{mole}}{36 \text{ g}} \right) \left(\frac{1}{2} \right) \left(\frac{110 \text{ g}}{\text{mole}} \right) = 6.875 \text{ g}$$

$$(5.8 \text{ g}) \left(\frac{\text{mole}}{100 \text{ g}} \right) \left(\frac{1}{1} \right) \left(\frac{110 \text{ g}}{\text{mole}} \right) = 6.38 \text{ g}$$

3pts.

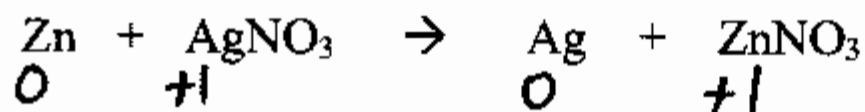
theo yield

2pts.
limiting reagent is CaCO₃

Quiz 3E
11 points

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1. Given the redox reaction below, answer the following questions.



a. Will this reaction occur in this direction? Yes/No

Yes 1pt

b. Which species is oxidized?

Zn 1pt

Which is reduced?

Ag 1pt

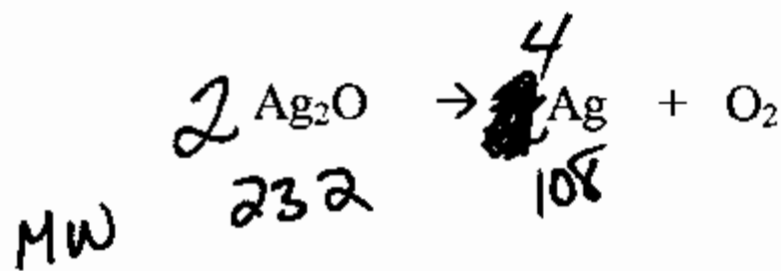
c. What is the oxidizing agent?

Ag or AgNO₃ 1pt

What is the reducing agent?

Zn 1pt

2. Silver oxide decomposes according to the following reaction. If all of your 12.3g of silver oxide decompose, how many grams of silver would it yield? Be sure to balance the reaction before starting. If you actually isolate 7.86g of silver, what is your % yield?



1pt - balance rxn.

$$(12.3\text{g}) \left(\frac{\text{mole}}{232\text{g}} \right) \left(\frac{4}{2} \right) \left(\frac{108\text{g}}{\text{mole}} \right) = 11.45\text{g Ag}$$

3pts.

$$\frac{7.86}{11.45} \times 100 = 68.6\%$$

2pts.