Name:
Date:

SCH3U

Teacher: C. Halupka

Unit Test-3 V.6 2018:

"Quantities in Chemistry"

Total:
/60

1. Fill in the blank: (5K)

a) How many molecules would there be in 4 moles of O_2? _____

b) If you had 3 moles of H_20, how much would it weigh? _____

c) How much do $6.02x10^{23}$ molecules of H_2O weigh? _____

d) Which has more molecules, 72.08g of Water or 96g of O_2 or 3.03g of H_2 ?_____

e) What is the molar mass of H_20? _____

2. Convert the following using the "cross method" (show work for full marks): (7K)

a.

25.4 m/sec = _____ Km/hr?(3)

b.

5 mole of O_2 = _____ g?(2)

c.

4.816 x 10^{46} molecules of H_2O = _____ g?(2)

Short Answer (Total:= 8 marks)

3. Circle what would **happen to the % yield** if the following occurred? **(4 marks T)**

   a. The solute being made has a high solubility? **(Increase, nothing, decrease)**

   b. Multiple types of glassware transfer occurred? **(Increase, nothing, decrease)**

   c. The solid sample was still wet with water? **(Increase, nothing, decrease)**

   d. A dirty beaker was used when making a chemical? **(Increase, nothing, decrease)**

4. Explain the difference between a **molecular** and an **empirical** formula and give an example of each? **(2 marks C)**

5. Explain what a **percent yield** of **greater than 100%** indicates. **(2 marks C)**

6. **Big Question #1**

If Stephanie was given 150 grams of O_2 then how much FeS_2 (in grams) would he needed and how much Fe_2O_3 and SO_2 (in grams) would be made?
Show work for full marks! **(Com marks for how you show your steps)**

K&T=	/6
Com=	/4

$$4\ FeS_2 + 11\ O_2 \longrightarrow 2\ Fe_2O_3 + 8\ SO_2$$

Answers

O_2 150 g?
FeS_2 g ?

Fe_2O_3 g ?
SO_2 g ?

7. **Big Question #2**

If Ian was given 131.2 grams of FeS_2 and Ethan was given 192.1 grams of O_2 then how much Fe_2O_3 would they produce in grams if they combine the two chemicals.
Show work for full marks! **(Com marks for how you show your steps)**

K&T=	/6
Com=	/4

$$4\ FeS_2 + 11\ O_2 \longrightarrow 2\ Fe_2O_3 + 8\ SO_2$$

Answer

Fe_2O_3_____g ?

8. **Big Question #3**
Kyra was doing a lab were the % yield for the production of $CaCO_3$ was 78% and the % yield for the production of NaCl was 40%. If she is required to make 89g of pure $CaCO_3$ for the "Cafeteria" then how many **grams** of $CaCl_2$ and Na_2CO_3 will she need to mix together to obtain the proper amount of $CaCO_3$?
(Com marks for how you show your steps)

K&T=	**/6**
Com=	**/4**

$$\underset{(105.99g/mol)}{Na_2CO_3} + \underset{(110.98g/mol)}{CaCl_2} \longrightarrow \underset{(58.44\ g/mol)}{2NaCl} + \underset{(100.09g/mol)}{CaCO_3}$$

Answers

Na_2CO_3 _____g?

$CaCl_2$_____g?

9. **Big Question #4**

Andrew thinks Jared is doing steroids because he has been ripping his shirts every time he scratches his back. When Jared is practicing his ballet moves in the gym, Andrew sneaks into Jared's bag and finds a baggie of an unknown powder. Andrew performs combustion analysis on the sample which revels it was 80% Carbon, 9.41% Hydrogen and the remainder Oxygen. A mass spectrometer analysis shows that the compound has a molar mass of 600.96 g/mol.

If Andrew knows the formula of the unknown substance then he can compare it to known steroid formulas commonly used to see if there is a match.

What is the empirical formula of the compound? _____
What is the molecular formula of the compound? _____

(Com marks for how you show your steps)

K&T=	**/6**
Com=	**/4**

10. Draw a picture of Jared Flexing (4/1moles of BONUS marks)!