**Quiz 8A**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. Do the following tests confirm the presence of hydrogen, carbon dioxide, or oxygen gas (3 points)?

|  |  |  |
| --- | --- | --- |
|  | A burning splint is brought to the mouth of a test tube and a barking sound is heard.  | Hydrogen gas |
|  | A burning splint is thrust into a test tube and the flame is extinguished. | Carbon dioxide gas |
|  | A glowing splint is thrust into a test tube and the flame reignites.  | Oxygen gas  |

1. Define the excess reagent (3 points).

The excess reagent is the reactant in a chemical reaction that does not limit the amount of product that can form.

1. An art student wants to make paper pulp to be used in a printing project. The student decides to use magnesium sulfite trihydrate to bleach the paper pulp. Magnesium sulfite trihdyrate decomposes upon heating releasing water vapor and leaving behind a white solid.
	1. Balance the unbalanced equation:

MgSO3 ∙ 3 H2O­ (s) $→$ MgSO3 (s) + 3 H2O (g)

* 1. Classify the type of reaction as combination, decomposition, single replacement, or double replacement.

Decomposition

* 1. Classify the reaction as exothermic or endothermic.

Endothermic

* 1. How many moles of water vapor can be collected if 0.5419 moles of magnesium sulfite trihydrate are decomposed?

$$0.5419 mol MgSO\_{3}∙3 H\_{2}O×\frac{3 mol H\_{2}O}{1 mol MgSO\_{3}∙3 H\_{2}O}=1.6257 mol H\_{2}O ≈1.626 mol H\_{2}O$$

* 1. If 2.31 g of magnesium sulfite trihydrate are decomposed, how many grams of magnesium sulfite could be collected?

$$2.31 g MgSO\_{3}∙3 H\_{2}O×\frac{1 mol MgSO\_{3}∙3 H\_{2}O}{158.408 g MgSO\_{3}∙3 H\_{2}O}×\frac{1 mol MgSO\_{3}}{1 mol MgSO\_{3}∙3 H\_{2}O}×\frac{104.363 g MgSO\_{3} }{1 mol MgSO\_{3}}=1.521883554 g MgSO\_{3}≈1.52 g MgSO\_{3} $$

* 1. If 230.2 g of magnesium sulfite are collected, what is the percent yield?

$$\%yield=\frac{m\_{actual}}{m\_{theoretical }}×100=\frac{230.2 g }{1.52 g}×100=15125.99301\%≈15100\%$$

Eeek! What happened in this experiment? This percent yield is much too high.