**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. What is the goal of the Chemical Reactions experiment (2 points)?

The goal of the chemical reactions experiment is to learn more about the different types of chemical reactions.

1. Define the limiting reagent (3 points).

The limiting reagent is the reactant in a chemical reaction that limits the amount of product that can form.

1. Quicklime (calcium oxide, CaO) is made by heating limestone (calcium carbonate, CaCO3) in slowly rotating kilns, which are a type of oven (15 points):

CaCO3 (s) + 178 kJ → CaO (s) + CO2 (g)

* 1. How many moles of carbon dioxide are released when 0.147 moles of quickline is produced?

$$0.147 mol CaO×\frac{1 mol CO\_{2}}{1 mol CaO}=0.147 mol CO\_{2} $$

* 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 kilojoules are required to convert 5.80 kg of limestone?

$$5.80 kg CaCO\_{3}×\frac{1000 g}{1 kg}×\frac{1 mol CaCO\_{3}}{100.086 g CaCO\_{3}}×\frac{178 kJ}{1 mol CaCO\_{3} }=10315.12899 kJ≈1.03×10^{4} kJ$$

* 1. If 0.2580 mol of limestone are heated, how many grams of quicklime could be produced?

$$0.2580 mol CaCO\_{3}×\frac{1 mol CaO}{1 mol CaCO\_{3}}×\frac{56.077 g CaO }{1 mol CaO}=14.467866 g CaO≈14.47 g CaO $$

* 1. If 10.453 g of quicklime are collected, what is the percent yield?

$$\%yield=\frac{m\_{actual}}{m\_{theoretical }}×100=\frac{10.453 g }{14.47 g}×100=72.23911541\%≈72.24\%$$