Unit 4 Benchmark #3 – Stoichiometry – PRACTICE

Each question will be worth 4 points. You must show all of your work.
Put your answer in the space provided! No Work = No Credit!

1. A chemist uses hot hydrogen gas to convert chromium(III) oxide to pure chromium. How many moles of hydrogen are need to convert 5 moles of chromium(III) oxide, Cr_2O_3?

$$Cr_2O_3 + 3H_2 \rightarrow 2Cr + 3H_2O$$

_____moles

2. How many liters of oxygen, O_2, are required for the complete combustion of ½ mole of pentane, C_5H_{12} at standard conditions?

$$C_5H_{12} + 8\ O_2 \rightarrow 5\ CO_2 + 6\ H_2O$$

_____liters

3. A chemist uses hot hydrogen gas to convert chromium(III) oxide to pure chromium. How many moles of hydrogen are need to convert 76 grams of chromium(III) oxide, Cr_2O_3?

$$Cr_2O_3 + 3\ H_2 \rightarrow 2\ Cr + 3\ H_2O$$

_____moles

4. Hydrogen can react explosively with oxygen to form water. How many liters of hydrogen are required to combine with 16 grams of oxygen at standard conditions?

$$2H_2 + O_2 \rightarrow 2H_2O$$

_____liters

5. How many grams of calcium are required to free 4 moles of hydrogen gas from hydrochloric acid, HCl?

$$Ca + 2HCl \rightarrow CaCl_2 + H_2$$

_____grams

6. Butane, C_4H_{10} burns in oxygen. How many liters of water vapor, H_2O, are produced by the combustion of 20 moles of butane at standard conditions?

$$2\ C_4H_{10} + 13\ O_2 \rightarrow 8\ CO_2 + 10\ H_2O$$

_____liters

7. How many liters of oxygen, at standard conditions, are needed to react with 90 grams of glucose, ($C_6H_{12}O_6$)?

$$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$$

_____liters

8. How many grams of oxygen are required to produce 9 grams of water at standard conditions?

$$2\ H_2 + O_2 \rightarrow 2\ H_2O$$

_____grams