

Reactions HW #4 – COMBUSTION

ANSWERS

USE loose leaf paper, write out answers completely (or copy questions)

1. Combustion reactions always have these 2 products: **carbon dioxide and water**
2. Combustion reactions always combine a hydrocarbon with **oxygen**
3. A hydrocarbon is a molecule which ONLY contains **carbon and hydrogen**
4. If octane (gasoline) burns cleanly and completely, what are the products?
carbon dioxide and water
5. Propane is written as C_3H_8 . Write the balanced chemical equation with phases for its combustion. $C_3H_{8(g)} + 5O_{2(g)} \rightarrow 3CO_{2(g)} + 4H_2O_{(g)} + HEAT$
6. Define EXOTHERMIC and ENDOTHERMIC reactions. **EXOTHERMIC means a reaction that gives off heat as part of the "products", while ENDOTHERMIC means that the reaction takes in heat as part of the "reactants". (Technically energy in which then cools the immediate area).**
7. Combustion reactions are always exothermic or endothermic reactions?
Combustion = exothermic
8. If methane gas in your Bunsen burner does not get enough oxygen, the combustion is not complete and carbon is also a product (along with the other two products you would expect from combustion). Balance this type of incomplete combustion with this extra product.
 $2CH_{4(g)} + 3O_{2(g)} \rightarrow C + CO_{2(g)} + 4H_2O_{(g)} + HEAT$
9. Soot, the fine black dust that fills up chimneys everywhere is the carbon that does not get to combine into carbon dioxide. Explain why increasing oxygen would eliminate this carbon from forming as soot in an incomplete combustion reaction. **Increasing oxygen allows for all of the carbon in the methane to form into carbon dioxide. Where there is a relative lack of oxygen the combustion is incomplete, allowing this carbon/soot to build up as a product.**
10. List the other four kinds of chemical reactions. Which of the five is your favorite and why? Be specific and or funny, it will help you remember. **Single Replacement, Double Replacement, Synthesis, and Decomposition. My favorite is Combustion because it makes big booms and makes for great in class demonstrations! There are other correct answers for this problem.**