Reactions HW #4 - Combustion Reactions Name: Key

1. Combustion reactions always have these 2 products $CO_{2(g)}$ + $H_2O_{(g)}$
2. Combustion reactions always combine a hydrocarbon with oxygen $O_{2(g)}$
3. A hydrocarbon is a molecule which ONLY contains carbon + hydrogen
4. If combustion is complete, what are the products? CO_2 + H_2O
5. Propane is written as C_3H_8. Write the balanced chemical equation with phases for its combustion.

$$C_3H_{8(g)} + 5O_{2(g)} \rightarrow 3CO_{2(g)} + 4H_2O_{(g)}$$

6. Define EXOTHERMIC Heat is a product
Reaction emits Heat overall
7. Combustion reactions are always (exothermic) ~~or endothermic~~ (circle one)
8. With insufficient oxygen, methane still burns, but undergoes incomplete combustion. The word equation is CH_4 and oxygen make solid carbon, carbon dioxide, and water. Balance that.

$$2CH_{4(g)} + 3O_{2(g)} \rightarrow C_{(s)} + CO_{2(g)} + 4H_2O_{(g)}$$

9. Soot is the fine black dust that fills up chimneys everywhere is the carbon that does not get to form into CO_2 during incomplete combustion. Why would increasing $O_{2(G)}$ would eliminate soot.

Soot = $C_{(s)}$ excess O_2 forms into $CO_2 + H_2O$
no loose C

10. List the other 4 kinds of chemical reactions you have learned already. Which of them is your favorite and why? Be specific or funny, it will help you remember.

Synth Decomp SR ♡ DR (+ combustion)