

### II-3: All-A-Glow HW

1. Predict which substance will combust, 10 g of calcium, Ca, or 10 g of calcium chloride  $\text{CaCl}_2$ ? Explain your reasoning. Write a balanced combustion reaction for the substance that combusts.

2. Propane ( $\text{C}_3\text{H}_8$ ) is a fuel used in camp stoves.

a. Draw the structural formula for propane.

b. Write the balanced chemical reaction for the combustion of propane.

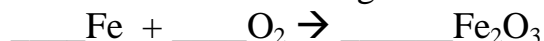
3. Hydrogen is a fuel used in the space shuttle.

a. Write the balanced chemical reaction for the combustion of hydrogen.

b. Write the Lewis dot structures for the reactants and product of this reaction.

4. When iron (Fe) rusts it reacts with oxygen.

a. Balance the following reaction for the formation of rust.



b. What is the charge on the Fe ion? Explain your reasoning.

c. Do you think rust is a combustion reaction? Explain your reasoning.

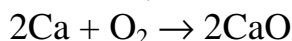
5. The chemical composition of sugar is  $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ .

a. What are the products when sugar is burned as fuel?

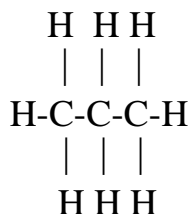
b. Write the chemical reaction for the combustion of sugar.

*Selected Answers:*

1. Ca, because Ca is not bonded to anything else and so has plenty of room for oxygen.  $\text{CaCl}_2$  has no room for oxygen (plus, it's ionic and ionic compounds are not combustible).



2a.



4b. It must be a 3+ charge. You can figure that out by un-criss crossing (the subscript 3 on the O must have come from the charge from Fe).

5a.  $\text{CO}_2$  and  $\text{H}_2\text{O}$