Chapter 3: Worksheet #2 Mass Relationships

1. Kerosene ($C_{11}H_{24}$) is used as a common fuel for lightweight camping stoves. If it takes 15 grams of kerosene to fry a trout for dinner, how many grams of water will be produced?

21 g H_2O

2. When we added solid sodium to water in lab, it produced sodium hydroxide, hydrogen gas and a lot of heat. How many moles of hydrogen gas was produced from 0.80 moles of sodium and an excess of water?

0.40 mole H_2

3. Sodium cyanide and carbon monoxide can be prepared from reacting solid sodium carbonate, solid elemental carbon and pure nitrogen gas. When 10.0 grams of carbon were reacted with excess sodium carbonate and nitrogen, the percent yield of sodium cyanide was 67%. What was the actual yield of sodium cyanide in grams?

13.7 g NaCN

4. When solid sulfur is burned in the presence of oxygen, the noxious, toxic gas sulfur dioxide results. Some hydrocarbon fuels have sulfur present and contribute to air pollution. If there is 0.50 grams of sulfur in each tank of gasoline, how many grams of sulfur dioxide will be expelled into the atmosphere per each tank of gasoline.

1.0 g SO_2

5. Water reacts with calcium carbide to produce $Ca(OH)_2$ and acetylene. The acetylene produced by this reaction was used to light miner helmet lamps. If 100.0 g of CaC_2 reacts with excess water, what mass of acetylene is produced?

$$CaC_2(s) + 2\,H_2O(\ell) \longrightarrow Ca(OH)_2(s) + C_2H_2(g)$$

40.62 g C_2H_2