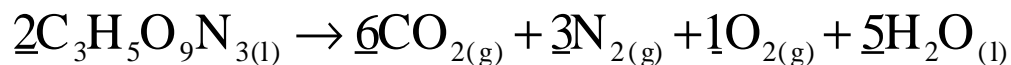


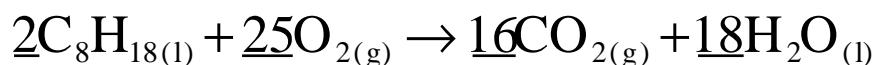
Balance the following chemical equations and answer the questions using the appropriate number of significant figures.

1.) How many grams of nitrogen gas are generated when 10.0 g of nitroglycerin ($C_3H_5O_9N_3$; FW = 225.12 g) are detonated?



Answer: 1.87 g N_2

2.) How many grams of carbon dioxide (FW = 44.01 g) will be produced when 20.0 grams of octane (C_8H_{18} ; FW = 114.23 g) are burned with 65.0 grams of oxygen?



Oxygen is the limiting reactant!

Answer: 57.2 g CO_2 produced

Chem 121A – Elemental Analysis and Chemical Equations

In a group of 4, work out the solutions to the following problems as directed by your instructor.

Over the last 20 years, a large amount of research has been devoted to understanding how refrigerants impact stratospheric ozone levels, and what alternatives or chemical substitutes are viable options. Freons were once commonly used refrigerants and blowing agents; Rowland and Molina implicated these chlorofluorocarbons (CFCs) in ozone destruction during the early 1970s. Consequently, CFCs have been phased out and replaced with HCFCs (hydrochlorofluorocarbons) and HFCs (hydrofluorocarbons). As part of a research team that studies refrigerants, you sent out samples for elemental analysis and received the following mass percent results.

Name	CFC-11	CFC-12	HCFC-141b	HFC-134a
FW	137.36	120.91	116.94	102.04
% C (w/w)	8.74	9.9	20.5	23.5
% F (w/w)	13.83	31.4	16.2	74.5
% Cl (w/w)	77.42	58.6	60.6	0.0
% H (w/w)	0.0	0.0	2.6	2.0

Empirical	$CFCl_3$	CF_2Cl_2	$C_2H_3FCl_2$	CHF_2
Molecular	$CFCl_3$	CF_2Cl_2	$C_2H_3FCl_2$	$C_2H_2F_4$

What are the empirical and molecular formulas for each chemical?