Chemistry / Environmental Studies L111 Environmental Concerns and Chemical Solutions Professor Dransfield Homework 5: Due March 8, 2007

Chapter 3 – The Chemistry of Global Warming

Fifth Edition Question Numbers: Emphasizing Essentials – #17, 24, 25 Concentrating on Concepts - #40, 41, 42, 45 Exploring Extensions - #56, 58

Fourth Edition Question Numbers:

Emphasizing Essentials - #14, 20, 21

Concentrating on Concepts - #38

Exploring Extensions - #48

And the following questions:

(From the Fifth Edition)

a) Write a balanced equation for the combustion of ethanol, C₂H₅OH. b) How many moles of CO₂ are produced from each mole of ethanol burned? c) How many moles of O₂ are required to burn 10 moles of ethanol?

II. a) Write a balanced equation for the combustion of hexane, C_6H_{14} .

b) Write a balanced equation for the combustion of octane, C_8H_{18} . c) Compare the number of moles of CO_2 produced when one mole of each

hydrocarbon is burned.

- III. How many metric tons of carbon are present in the 73 million metric tons of methane (CH₄) produced each years by cattle and sheep?
- IV. One Standard Cubic Foot (SCF) of natural gas contains 1196 moles of methane (CH₄) at 15.6 °C.

a) How many moles of CO₂ could be produced by burning 1 SCF of natural gas?b) how many kg of CO₂ is that?

c) how many metric tons of CO_2 is that? (Use the appendix for conversions)

d) how many pounds of CO₂ is that?