CHM 1020-01 **QUIZ 3** **February 5, 1999**

This quiz is take-home and open book, and it is intended that all members of the group contribute to completing it. It is a violation of the Academic Honor Code to sign a quiz that you did not work on. **The quiz is due at the end of class on Thursday, February 11.**

List names in alphabetical order, and give social security numbers! Put names on all pages, and stapel pages together

Points

1. Ethanol (C_2H_5OH) is discussed as an alternative fuel for gasoline engines.

(2) (a) Write a balanced equation for the complete combustion of ethanol.

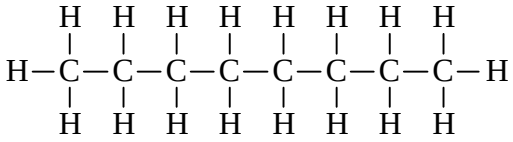
(3) (b) The heat produced in the combustion of one mole of ethanol is 1250 kJ. Convert this figure to heat produced **per mole of CO_2** produced, and heat produced **per gram** of ethanol consumed.

2 To compare ethanol and gasoline as a fuel, consider a main constituent of gasoline as having the formula C_8H_{18}.

(2) (a) Write a balanced equation for the complete combustion of C_8H_{18}.

List names in alphabetical order**.** **Be sure to staple pages together!**

(3) 2(cont) (b) Use the bond energy method to calculate the heat produced in the reaction in part (a). Consider the structure of C_8H_{18} as:



(3) (c) Calculate the heat produced from combustion of C_8H_{18} **per mole of CO_2** produced and **per gram** of C_8H_{18} consumed.

(2) 3. Compare the results of 1(b) and 2(c) and state:

(a) Which fuel provides more energy per unit mass?

(b) Which fuel contributes more to the greenhouse effect through CO_2 production **per unit of energy produced**?