Advanced Chemistry: Ch. 12 Worksheet. Installment #3. Name:

Please transfer your work onto a separate piece of paper. You will need the extra room.

1. Draw a structural formula for the following molecules and correctly name them using IUPAC rules
   a. A 4—C alcohol with a methyl substituent

   b. A 6—C carboxylic acid that contains only 4—carbons in the parent chain

   c. A butanethiol that contains 7 total carbons

   d. A pentanal that contains an isopropyl substituent

   e. Two isomers, one open chain and one cyclic, with the formula C_5H_8

2. Correct the following names using IUPAC rules. If they are acceptable, just let them be.
   a. 2-Isopropyl butane

   b. *tert*-Butyl alcohol

   c. *cis*-3-*tert*-Butylcyclopentane

   d. 4-Hydroxy-3-methylbutanethiol

   e. 1-Carboxy-2-propanol

   f. 2,4-Bromopentane

3. Place the following sets of molecules in order of increasing boiling points. (That's lowest to highest)
   a. Pentane, Heptane, and 2-Methylbutane

   b. 2-Methylpentane, 2,2-Dimethylbutane, Hexane

   c. Chloromethane, Methane, Dichloromethane

   d. Butanol, Butane, 2-Methylpropane

4. Complete the following
   a. Write a balanced chemical equation for the complete combustion of butane

   b. Write a balanced chemical equation for the incomplete combustion of propane that produces carbon monoxide along with carbon dioxide and water.

   c. Write a balanced chemical equation for the bromine substitution reaction of C_4H_{10}

   d. What are all the potential products from this reaction? (That's from 4c)

   e. Which product would predominant in the previous reaction? (That's from 4c again)

5. Challenging problems
   a. How many liters of methane would it take at STP to produce 26.5 g of chloroform

   b. Draw the initiation reaction, all elongation reactions and the termination reaction from 5a if the methane is the limiting reactant.