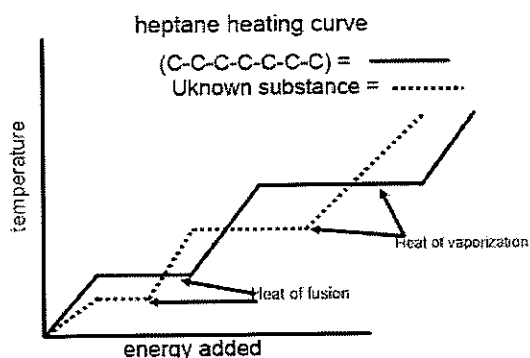


Preliminary Quiz 3 – Solids
Stoichiometry is on the quiz

PDF

Multiple Choice

Identify the choice that best completes the statement or answers the question.



1. (#4-1a) The heating curve above shows the temperatures at which a substance is a solid, liquid and a gas. Which of the following is true relative to pressure and temperature?

- I. As a solid is converted to a liquid, no energy is required the temperature remains constant.
II. Adding temperature will directly cause the substance to warm
- a. I only
b. II only
c. Both I and II
d. Neither I or II

2. (#4-1b) Which of the following statements are true relative to the graph above?

- I. Hydrogen bonding is disrupted as heptanes is melted/boiled.
II. The heat of fusion of the known is larger possibly due to a longer carbon chain of heptane.
- a. I only
b. Neither I or II
c. II only
d. Both I and II

3. (#4-1c) A 10g sample of hexane (C_6H_{14}) has

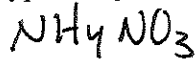
- I. a larger number of hydrogen atoms then carbon atoms
II. the same percent Carbon by mass as C_3H_7
- a. I only
b. II only
c. Both I and II
d. Neither I or II

4. (#4-1c) 25g of H_2 reacts with 25g of oxygen, which of the following is correct ($2H_2 + O_2 \rightarrow 2H_2O$)

- I. You will get 50g of product
II. The reactants react in a 1:1 ratio
- a. I only
b. II only
c. Both I and II
d. Neither I or II

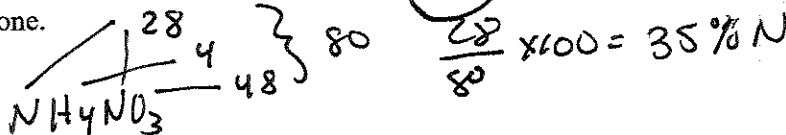
1. Ammonium Nitrate is a typical ingredient in fertilizer.

a) Write the formula.



← This is 50%

b) A 50-gram sample of ammonium nitrate has (More/Less or equal) then 25g of nitrogen contained in the sample. Circle one.



c) When ammonium nitrate is heated it decomposes into N_2 gas, O_2 gas and water vapor. List the bonds broken and formed during this process?

Broken	Formed
<div style="text-align: center;"> NH_4NO_3 ↑ Covalent ↑ LDF </div>	<div style="text-align: center;"> N_2 O_2 Covalent LDF </div>

$\% O = \frac{48}{80} \times 100 = 60\%$
 $.60 \times 50 = 30g$

2. When 50g of ammonium nitrate is decomposed, how much mass of O_2 is produced?

3. An unknown hydrocarbon (only Hydrogen and Carbon) is put in to a commercial internal combustion engine and burned. The hydrocarbon was 85.71% C. Hold 4 sigfigs!

a) Determine the percent mass H in the hydrocarbon.

$\frac{100}{85.71} = 117.29\%$

b) Determine the empirical formula.

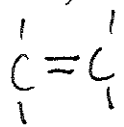


$85.71g \cdot \frac{1 \text{ mol}}{12.01} = 7.14 \text{ mol} / 7.14 = 1$ (empirical)
 $100g \rightarrow 17.29g \cdot \frac{1 \text{ mol}}{1.01} = 17.29 \text{ mol} / 7.14 = 2$

c) The actual substance has a molecular mass of 28.00 g/mol. What is the molecular formula?

$28/14 = 2 \quad C_2H_4$

d) Draw a Lewis structure of this substance. (review)



e) Is this substance polar or non-polar?

NO

f) What force is disrupted upon melting of this substance?

LDF