

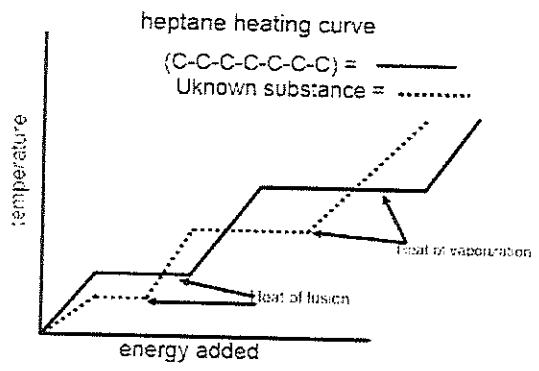


Preliminary Quiz 3 – Solids

#4-1 Quiz 3c MC

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. Pressure will not affect the state of a substance so is not measured in the graph. *No*
 II. Adding temperature will directly cause the substance to warm. *Not always → NO*
 a. I only
 b. Neither I or II
 c. II only
 d. Both I and 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. *No*
 II. The heat of fusion of the known is larger possibly due to a longer carbon chain of heptane. *YES*
 a. I only
 b. Neither I or II
 c. II only
 d. Both I and II
3. (#4-1c) A 10g sample of hexane (C₆H₁₄) has
 I. a larger mass of hydrogen then carbon *Y*
 II. a larger number hydrogen atoms then carbon atoms *Y*
 III. the same percent Carbon by mass as C₃H₈ *YES*
 a. I only
 b. II only
 c. II and III only
 d. I, II and III

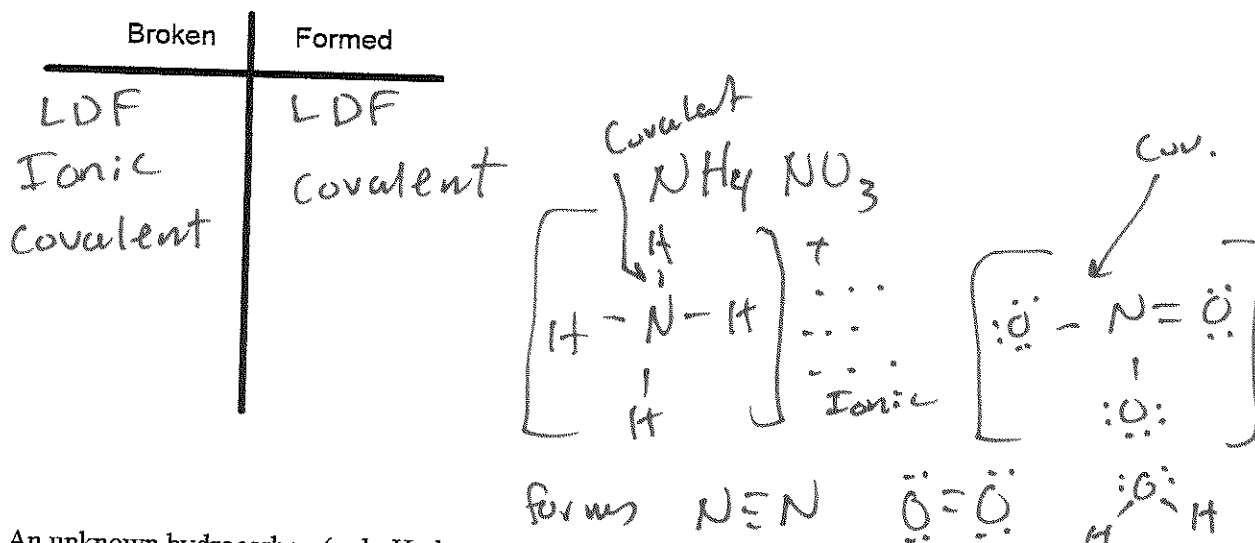
1. Ammonium Nitrate is a typical ingredient in fertilizer.

a) Write the formula. NH_4NO_3

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

$$\% \text{N} = \frac{28}{80} \times 100 = 35\% \quad \uparrow \quad 50\% \text{ so less}$$

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?



2. 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!

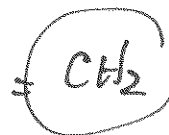
a) Determine the percent mass H in the hydrocarbon.

$$100 - 85.71 = 14.29$$

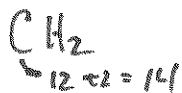
b) Determine the empirical formula.

$$\text{H } 14.29 \cdot \frac{1}{1} = 14.29 \text{ mol} = 2.000$$

$$\text{C } 85.71 \cdot \frac{1}{12.00} = 7.143 \text{ mol} = 1.000$$



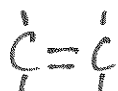
c) The actual substance has a molecular mass of 28.00 g/mol. What is the molecular formula?



$$28 / 14 = 2$$



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



or



e) Is this substance polar or non-polar?

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

Bond

LDF