

PHASES LAB - the cooling curve for Lauric Acid. name: _____

Purpose: to create a graph showing the cooling curve for lauric acid and to determine the melting point/freezing point of lauric acid from the data you will collect and graph.

Procedure:

Obtain one test tube of Lauric Acid, formula: $\text{CH}_3(\text{CH}_2)_{10}\text{COOH}$, already melted from the hot water baths. Place your tube into a test tube rack with the lauric acid thermometer inside it. Record temperature to the TENTH of a degree every minute until it reaches 34°C . This could take 50 minutes.

Return Lauric Acid tubes to proper locations, wipe off lab tables.

Graphing:

- graph temperature in centigrade as a function of time in minutes
- graph must be done in pencil only
- be sure to have a good title and labels with units
- draw THREE STRAIGHT LINES, best fit, as shown to you in class
- Label 4 points ABC and D, as shown in class

Chart (fill this in AFTER GRAPHING) write: steady, increasing, decreasing, solid, liquid, or gas phase			
graph line segment:	AB	BC	CD
What is happening to the mass of the lauric acid?			
What is happening to the temperature of the sample?			
What is happening to the kinetic energy of the sample?			
What is happening to the potential energy of the sample?			
What phase or phases are present?			

Questions (one point each):

1. What is the melting point for lauric acid according to your graph? Explain how you know this for sure.
2. Why does line segment BC on the graph NEED to be parallel to the X axis?
3. Explain how kinetic energy relates to the three phases of water.
4. Explain how FREEZING POINT and MELTING POINT are the same.
5. Determine the molar mass for lauric acid.
6. Determine the % composition by mass of each element in lauric acid.
7. Look up the actual freezing point of lauric acid on the internet (answers.com) What was your percent error?
8. Explain your percent error, make sure your answer is in synch with your error.
9. If the pressure is 80 kPa, temperature is 378 Kelvin, which of the 4 compounds on table H is a liquid or gas?

page of report	includes	points (25 total)
cover page	title and intro sentences	1 + 1
graph	title, labels, units, 3 lines, label the points ABCD, etc.	8
chart	fill in all boxes on page 1	3
9 questions	use complete sentences, show all work	9
conclusion	make sure you CONCLUDE what you did in lab: use your data, what did you calculate, state the measured melting point, state your % error and reasons that explain it.	3
80 minutes lab time, due:		25

Data Table. Record temperature in degrees centigrade each minute until you reach 34 degrees centigrade.

0		21		42	
1		22		43	
2		23		44	
3		24		45	
4		25		46	
5		26		47	
6		27		48	
7		28		49	
8		29		50	
9		30		51	
10		31		52	
11		32		5	
12		33		54	
12+1		34		55	
14		35		56	
15		36		57	
16		37		58	
17		38		59	
18		39		60	
19		40		61	
20		41		62	