

Phase Change: Boiling

Name _____ Date _____ Period ___ Group ___

Objectives:

- 1-To collect time and temperature data as a liquid is heated to boiling and then graph the data.
- 2-To determine the boiling point of the substance from the graph and use it to identify the substance.

Procedures:

1-Add one or two boiling chips to about 1/3 to 1/2 of a test tube of the liquid given to you by your teacher.

2-Heat it as shown in the diagram making sure that the burner wick is no more than 5 mm high.

3- Record the temperature of the liquid every half minute until about half of the liquid is boiled away or your teacher says otherwise. Indicate on the time/temperature chart when the liquid is steadily boiling by putting an asterisk(*) next to that temperature.

4-Make a graph of the data collected with time in minutes on the horizontal axis and temperature in degrees Celsius (°C) on the vertical axis.

- a. Place tick marks every 2 lines apart along the x-axis and number each tick mark by 1's beginning with 0 at the bottom left corner and continuing to the right.
- b. Place ticks marks every 5 lines going up on the y-axis and number each tick mark by 10's beginning with 10°.

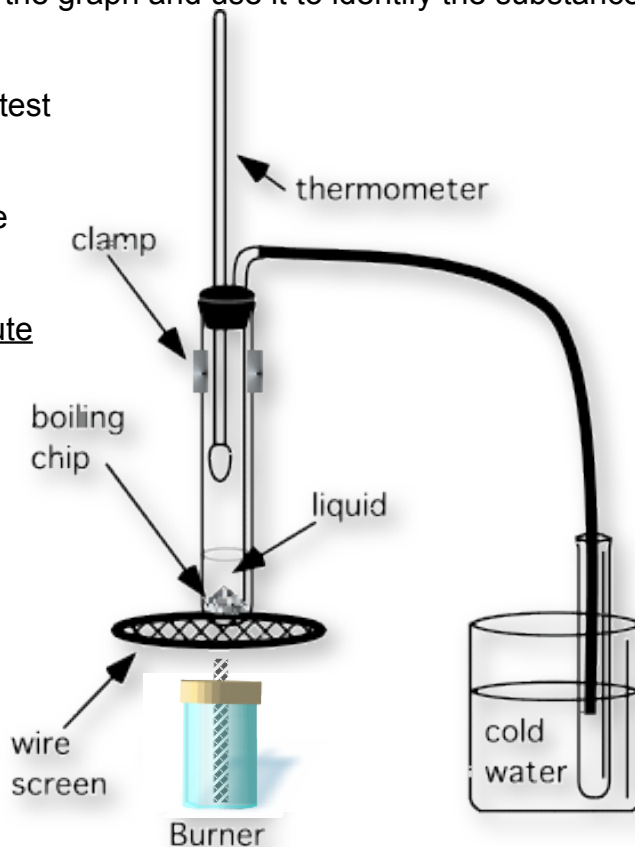
5-Also indicate which liquid you are using in the space provided below.

Materials: See diagram at upper right.

Safety:

Wear safety goggles, proper footwear and have long hair tied back through the entire experiment as the liquid boils away. Collect any vapors given off, into the test tube which is in the cold water bath as shown in the diagram.

Liquid Being Used _____



Observations
Use pencil only

Time in minutes	Temperature in °C to 0.1°C	Time in minutes	Temperature in °C to 0.1°C
0		12	
0.5		12.5	
1		13	
1.5		13.5	
2		14	
2.5		14.5	
3		15	
3.5		15.5	
4		16	
4.5		16.5	
5		17	
5.5		17.5	
6		18	
6.5		18.5	
7		19	
7.5		19.5	
8		20	
8.5		20.5	
9		21	
9.5		21.5	
10		22	
10.5		22.5	
11		23	
11.5		23.5	

The graph must be constructed and the class results collected before the questions are answered!

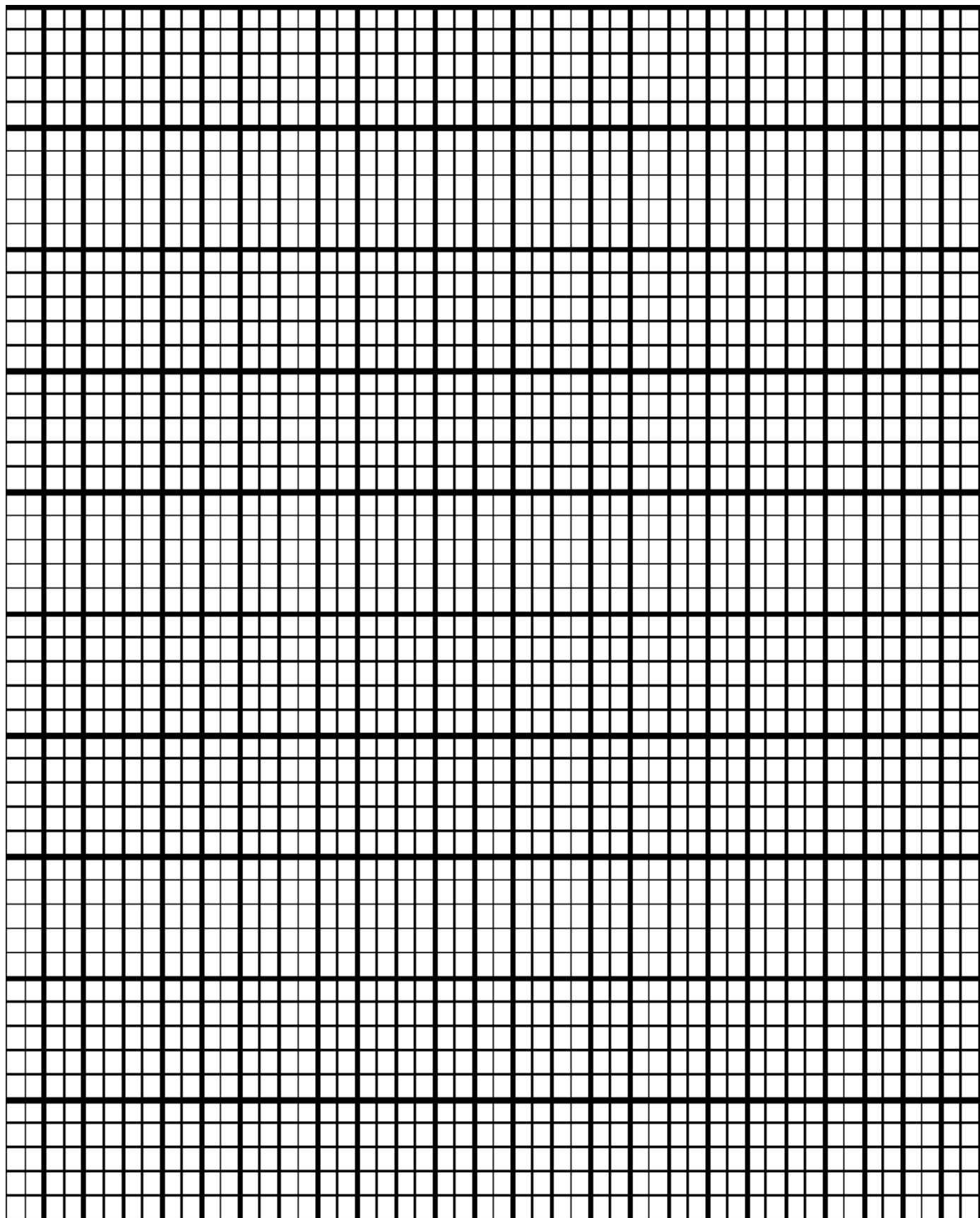
1. Examine the graphs of other students in class for this experiment. Do they have a flattened plateau on it ? Tell how many do have a plateau and how many do not have a plateau on their graph!

Title of Graph _____

USE PENCIL ONLY ON GRAPHS!

Make small points for your graph with a small circle around each point like this: ⊙

Draw a smooth connect the dots line after all points are plotted.



Class Results:

Group	Boiling Point °C (Liquid A used)	Group	Boiling Point °C (Liquid B used)
1		2	
3		4	
5		6	
7		8	
9		10	
11		12	
13		14	
15			
	Range of Data	Range of Data	
	Mode(s)	Mode(s)	

2. What is the range of boiling point temperatures for liquid 1, **as well as** for liquid 2 ?
(complete sentences)

3. What would a twenty degree difference in boiling point temperatures between two liquids suggest about the liquids? (complete sentences)

Sources of Error :Identify **two** things that people may have done incorrectly that would have caused them to get totally different answers from the rest of the class. These errors must be unique, in other words they have not been applicable in previous labs. They must be **new** sources of error. Be **specific** about what might have been done.
