**Heating Curve of Lauric Acid**

* ***Question: How do you illustrate the changes of state using a time/temperature graph?***

**Data Table**

*(Copy into your lab notebook before lab day.)*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Time in 30 second intervals** | **Temperature of Lauric Acid in C** | **Time in 30 second intervals** | **Temperature of Lauric Acid in C** | **Time in 30 second intervals** | **Temperature of Lauric Acid in C** | **Time in 30 second intervals** | **Temperature of Lauric Acid in C** |
| **0** |  | **13** |  | **26** |  | **39** |  |
| **1** |  | **14** |  | **27** |  | **40** |  |
| **2** |  | **15** |  | **28** |  | **41** |  |
| **3** |  | **16** |  | **29** |  | **42** |  |
| **4** |  | **17** |  | **30** |  | **43** |  |
| **5** |  | **18** |  | **31** |  | **45** |  |
| **6** |  | **19** |  | **32** |  | **46** |  |
| **7** |  | **20** |  | **33** |  | **47** |  |
| **8** |  | **21** |  | **34** |  | **48** |  |
| **9** |  | **22** |  | **35** |  | **49** |  |
| **10** |  | **23** |  | **36** |  | **50** |  |
| **11** |  | **24** |  | **37** |  | **51** |  |
| **12** |  | **25** |  | **38** |  | **52** |  |

* **Safety:**

Goggles and aprons are required.Be careful with the hot plate as with all electrical equipment.Be aware that hot glassware does not look hot.

* **Procedure:***(*✓ *each of the steps as you complete them.)*
* 1. Fill a 250mL beaker with about 200mL tap water and place the beaker on an OFF hot plate.
* 2. With a clamp, support a test tube containing lauric acid on a ring stand.
* 3. Place the test tube containing lauric acid and a thermometer into the water of the beaker. Do not let the test tube rest on the bottom of the beaker.
* 4. Record temperature. This is your Start - 0.
* 5. Turn on hot plate – if adjustable, use 5 setting – Start timing.
* 6. Observe and record the temperature at 30 second intervals and CIRCLE the temperature at which you FIRST observe ANY liquid lauric acid. (Liquid lauric acid is clear.)
* 7. Continue to observe and record the temperature at 30 second intervals and CIRCLE the temperature at which ALL the lauric acid has changed to liquid.
* 8. Continue to observe and record the temperature at 30 second intervals for TEN (10) MORE measurements after all the lauric acid has melted. (There may be more spaces on the data table than needed.)
* 9. When finished with the lab, unplug / turn off hot plate. Place the test tube containing the liquid lauric acid in your test tube rack. Keep the thermometer in the test tube, please! Empty the beaker of heated water into the sink.
* **Calculations:**

Make a **Temperature vs Time** graph for the heating of lauric acid.

EXTRA CREDIT: On the curve clearly label the following items in the appropriate locations (used arrows as needed to indicate direction or exact location on the curve. Some terms may be used more than once, as needed.):

*Solid Liquid Solid & Liquid Direction of exothermic changes*

*Solidification (Freezing) Melting KE not changing Direction of endothermic changes*

*Melting point KE changing*