

Phase Changes

Name: _____

Yesterday, you experimentally made a heating curve for water. Due to experimental error in our equipment, our heating curve was close, but not completely accurate. Below is a true heating curve for water. Use the heating curve for water below to answer the analysis questions.

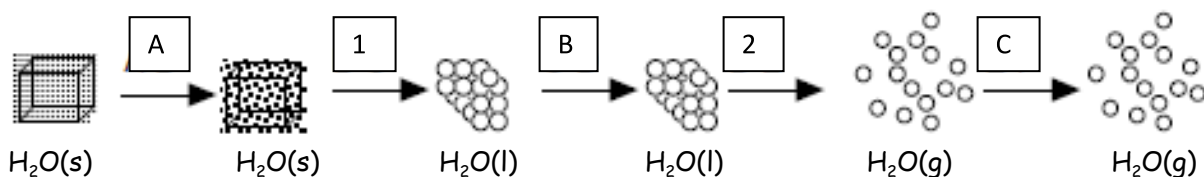
Analysis:

1) Describe what is happening in terms of energy when the line in the graph is increasing.

2) Describe what is happening in terms of energy when the line in the graph is flat.

3) On the curve above, label the portions of the graph that represent ice, liquid water, and water vapor.

4) The following is a diagram of what happens to water molecules as they are heated and transform from solid (ice) to liquid (water) to gas (vapor). Label on your graph where A, B, C, 1, and 2 occur.

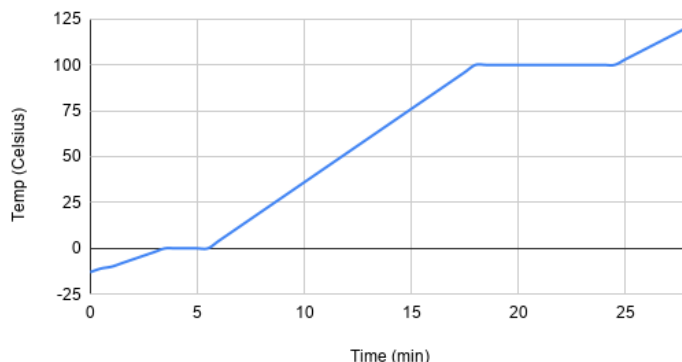


5) The x-axis represents the time heating the water. Between roughly 3 - 6 minutes and 17 - 24 minutes, the temperature remains constant.

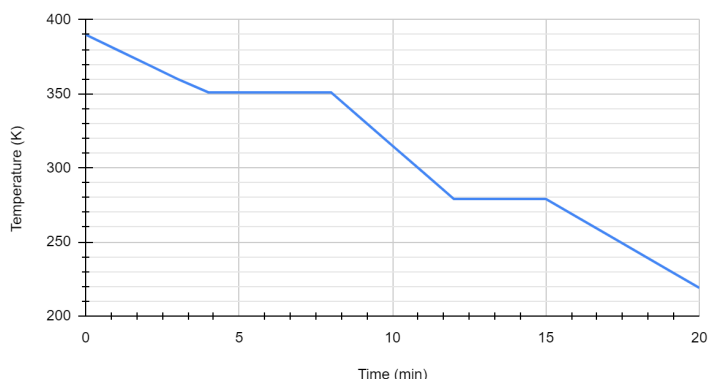
a) During those time intervals, is heat still being added to the water?

b) What is the added heat doing if it is not increasing the temperature?

Heating Curve for Water



Cooling Curve of Benzene



Use the cooling curve of benzene to the left for question 6.

6) Identify the temperatures for benzene's:

a) freezing point: _____

b) condensation point: _____

c) liquid temperature range: _____

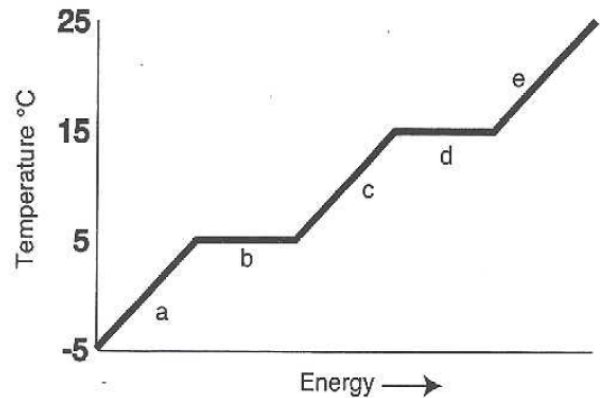
d) solid temperature range: _____

For questions 7 - 13, use the heating curve of a hypothetical substance to the right:

7) What is the melting temperature of the substance? _____

8) What is the freezing temperature of the substance? _____

9) What is the boiling temperature of the substance? _____



10) The part of the graph labeled "e" represents temperatures at which gas is being heated. Describe what is happening for each of the other lettered sections of the graph:

a) _____

b) _____

c) _____

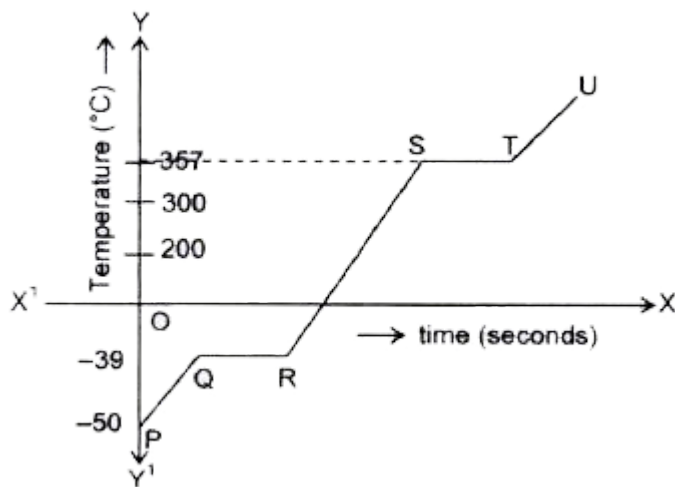
d) _____

11) In which section of the graph are atoms moving the least?

12) In which section of the graph is this substance all liquid?

13) On the graph above, draw an arrow to and label each of the following: "melting begins", "melting complete", "boiling begins" and "boiling complete".

For questions 14 & 15, use the heating curve of mercury below:



14) Between what letters would the following exist:

a) solid mercury: _____

b) mercury gas: _____

c) both liquid and solid mercury: _____

d) both liquid and gas mercury: _____

15) At what temperature will mercury gas condense into a liquid when cooled?