## HEATING CURVE WORKSHEETS

## Name :

Date :

The diagram below is a plot of temperature vs time. It represents the heating of what is initially ice at  $-10^{\circ}$ C at a near constant rate of heat transfer.



- 1. a) What phase or phases are present during segment (1)\_\_\_\_
  - b) What is happening to the energy being absorbed from the heat source?
     (answer in terms of potential kinetic energy)\_\_\_\_\_\_\_
     c) What phase change, if any, is taking place?\_\_\_\_\_\_

2.	<ul> <li>a) What phase or phases are present during segment (2)</li> <li>b) What is happening to the energy being absorbed from the heat source?</li> <li>(answer in terms of potential kinetic energy)</li> <li>c) What phase change, if any, is taking place?</li> </ul>
3.	a) What phase or phases are present during segment (3) b) What is happening to the energy being absorbed from the heat source? (answer in terms of potential kinetic energy) c) What phase change, if any, is taking place?
4.	<ul> <li>a) What phase or phases are present during segment (4)</li> <li>b) What is happening to the energy being absorbed from the heat source?</li> <li>(answer in terms of potential kinetic energy)</li> <li>c) What phase change, if any, is taking place?</li> </ul>



- 5. a) What phase or phases are present during segment (5)\_\_\_\_\_\_
  b) What is happening to the energy being absorbed from the heat source?
  (answer in terms of potential kinetic energy)\_\_\_\_\_\_
  c) What phase change, if any, is taking place?\_\_\_\_\_\_
- 6. What is the melting point of this substance?\_\_\_\_\_
- **7.** At What temperature would this sample finish boiling?\_\_\_\_\_

The heat fusion for water (Hr) is 334 J/gram and the heat of vaporization (Hv) for water is 2260 J/gram.

**8.** How much energy would be required to melt 500 grams of ice at 0°C to water at 0°C?

9.	How much energy would be required to change 50.0 kg of ice at -15.0°C to
	liquid water at 50.0°C?



ANSWER KEY

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The diagram below is a plot of temperature vs time. It represents the heating of what is initially ice at  $-10^{\circ}$ C at a near constant rate of heat transfer.



2.	a) What phase or phases are present during segment (2)	Solid and Liquid
	b) What is happening to the energy being absorbed fro	om the heat source?
	(answer in terms of potential kinetic energy)In	crese in PE
	c) What phase change, if any, is taking place?	lelting
Q	a) What phase or phases are present during segment (3)	Liquid

- a) What phase or phases are present during segment (3)\_\_\_\_\_\_
   b) What is happening to the energy being absorbed from the heat source? (answer in terms of potential kinetic energy)\_\_\_\_\_\_
   c) What phase change, if any, is taking place?\_\_\_\_\_\_
- a) What phase or phases are present during segment (4) Liquid and Gas
  b) What is happening to the energy being absorbed from the heat source? (answer in terms of potential kinetic energy) Increse in PE
  c) What phase change, if any, is taking place? Vaporization



- Gas a) What phase or phases are present during segment (5)\_ 5. b) What is happening to the energy being absorbed from the heat source? **Increse in KE** (answer in terms of potential kinetic energy)\_ None c) What phase change, if any, is taking place?\_ 0°C What is the melting point of this substance?\_\_\_\_ 6. 100°C At What temperature would this sample finish boiling?\_ 7. The heat fusion for water (Hr) is 334 J/gram and the heat of vaporization (Hv) for water is 2260 J/gram. How much energy would be required to melt 500 grams of ice at 0°C to 8. water at 0°C? Q = m Hf= 500 g x 334 J/g = 167000 J
  - **9.** How much energy would be required to change 50.0 kg of ice at -15.0°C to

liquid water at 50.0°C?

$Q_1 = (50.0)(2.02)(150)$	$Qtotal = Q_1 + Q_2 + Q_3$
= 1515 J	= 1515 + 16700 +10450
	= 273015 J
Q <sub>2</sub> = (50.0)(334)	
= 167000 J	
Q <sub>3</sub> = (50.0)(4.18)(50.0)	
= 104500 J	

