Dougherty Valley HS Chemistry
Thermochemistry – Heating and Cooling Curves

Worksheet #6

Name: **Period:** **Seat#:**

Specific Heats:

C_{ice}: 2.09 $\frac{J}{g°C}$

C_{water}: 4.184 $\frac{J}{g°C}$

C_{steam}: 1.87 $\frac{J}{g°C}$

Latent Heats: *(positive if melting/vaporizing, negative if freezing/condensing)*

Fusion: 334 $\frac{J}{g}$

Vaporization: 2260 $\frac{J}{g}$

Conceptual Questions

1) Why do heating curves "go up" and why do cooling curves "go down?" Explain.	**2)** Explain what happens to the molecules when heat energy is added during a phase change. Draw a diagram.	**3)** Explain what happens to the molecules when heat energy is added and the temperature raises. Draw a diagram.

4) Draw and label EVERY part of a heating curve for a 100g sample of ice that is heated from -16°C to 105°C. Calculate the total amount of heat required.

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Mathematical Questions:

- Show plugging in the variables to the correct places in the equation
- Get an actual answer, including units! Box your answer!
- Don't forget - you must show units and any conversions that might be involved.
- Some answers are provided at the end. They are underlined.

Graph and Line Segments	Calculations (Box Final Answer)
5) Find the amount of heat (Q) needed to raise the temperature of 5.00 g of water from 20.0°C to 105°C.	
6) How much energy is required to completely vaporize 200.0 g of 25.00ºC liquid water?	
7) How much energy is required to melt 150.0 g of –18ºC ice, and bring the resulting liquid water up to 25.00ºC?	

8) How much heat is needed to raise the temperature of 10g ice at -20°C to 0°C.	
9) How many joules are required to melt 275.0 kg of ice?	
10) Determine the heat needed to raise the temperature of 15 g of ice at -20ºC to 125ºC.	

11) Calculate the amount of heat transferred when 2.0 L of water at 25.0°C (1mL = 1g) is frozen to -10.0°C. Is this process exothermic or endothermic?	
12) What mass of water (in kg) at 100.0°C could be completely vaporized with 2.70×10^6 kJ of energy?	
13) How many joules (J) of energy are released when 6.80×10^3g of steam at 100.0°C are completely frozen to ice at 0.0°C?	