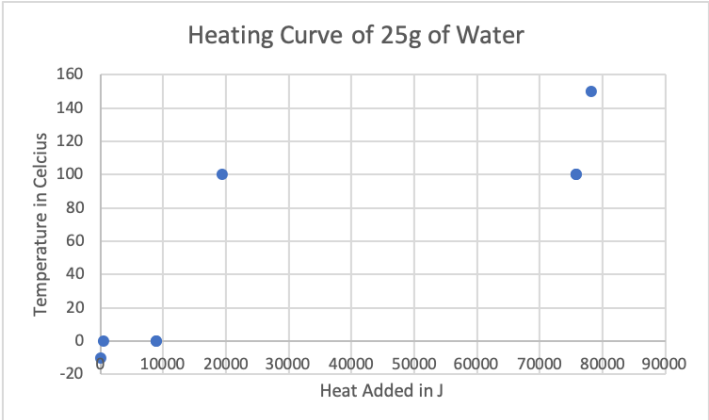
Ch 6 & 18: Thermochemistry and Chemical Thermodynamics

1. According to the graph located below, what is the approximate energy required to evaporate 25g of water?



A) 10 kJ
B) 75,000 J
C) 55 kJ
D) 2,500 J
E) 9 kJ

2. How much energy (in J) is needed to convert 1.70 g of $H_2O(l)$ at 100°C to $H_2O(g)$at 125°C? Use the following information as needed:

$\Delta H_{vap} = 4.07 \times 10^4$ J/mol
$\Delta H_{fus} = 6.01 \times 10^3$ J/mol
Specific heat of $H_2O(s)$ = 2.09 J/g°C
Specific heat of $H_2O(l)$ = 4.18 J/g°C
Specific heat of $H_2O(g)$ = 2.03 J/g°C

A) 3930 J
B) 4310 J
C) 3870 J
D) 3840 J
E) 3310 J

3. Which of the following statements is true for a system that releases 38 J of heat and has 102 J of work done on it?

A) The ΔE = -64 J and the net flow of energy is out of the system.
B) The ΔE = +64 J and the net flow of energy is out of the system.
C) The ΔE = -64 J and the net flow of energy is into of the system.
D) The ΔE = +64 J and the net flow of energy is into of the system.
E) None of the above statements are true.

4. Which of the following signs of q and w represent a system that is doing work on the surroundings and gaining heat from the surroundings?

A) q = +, w = +
B) q = -, w = +
C) q = -, w = -
D) q = +, w = -
E) None of the above represent the system.

5. Given the data below, what is the ΔH^o_{rxn} in kJ for the reactin below?

$$3NO_2(g) + H_2O(l) \longrightarrow 2HNO_3(aq) + NO(g)$$

Substance	ΔH^o_f (kJ/mol)
$H_2O(l)$	-285.8
$H_2O(g)$	-241.8
$NO(g)$	90.25
$NO_2(g)$	33.2
$HNO_3(l)$	-174.1
$HNO_3(g)$	-135.1
$HNO_3(aq)$	-206.6

A) -508
B) 64
C) 137
D) -137
E) -64