Thursday:

1. (3 points) A process is *exothermic*, circle all that MUST be true.

$q < 0$ $\Delta U < 0$ The surroundings get hot.

2. (5 points) A process is *endothermic* and *gas is consumed*, circle all that MUST be true.

$w > 0$ $|q_v| > |q_p|$ $q_v > q_p$

The surroundings get cold

T_{final} (constant pressure) $> T_{final}$ (constant volume)

3. (2points) An ice cube, initially at -40°C, with mass 72 grams is placed on top of a 1000. g iron plate ($c_p = 1 \frac{J}{g \cdot K}$). If the temperature of the iron plate drops by 15°C, what is the final temperature of the H_2O. ? (Hint: drawing the heating curve may help you)

$c_{ice}=2 \frac{J}{g \cdot K}$; $c_{water}=4.2 \frac{J}{g \cdot K}$; $\Delta H_{fus(water)}=6.00kJ/mol$; $\Delta H_{vap(water)}=42kJ/mol$

T_{final}= 0°C we are still melting

$q_{Fe}=m_{Fe}c_{Fe}\Delta T_{Fe}$= -15kJ energy provided by the iron

$q_{fusion(ice-water)} = \Delta H_{fus(water)}$=4moles *6.00kJ/mol= 24.0kJ energy needed to completely melt all of the ice(4mols)

$q_{ice}= m_{ice}c_{ice}\Delta T_{ice}$=5.76kJ energy needed to increase temperature of ice from -40 °C to 0 °C

Friday

1. (3 points) A process is *endothermic*, circle all that MUST be true.

   $q > 0$ $\Delta U > 0$ The surroundings get cold.

2. (5 points) A process is *exothermic* and *gas is formed*, circle all that MUST be true.

$w < 0$ $|q_v| > |q_p|$ $q_v < q_p$

The surroundings get hot.

T_{final} (constant pressure) < T_{final} (constant volume)

3. (2points) An ice cube, initially at -20°C, with mass 36 grams is placed on top of a 1000. g iron plate ($c_{Fe} = 1 \frac{J}{g \cdot K}$). If the temperature of the iron plate drops by 10°C, what is the final temperature of the H_2O (Hint: drawing the heating curve may help you)

$c_{ice}=2 \frac{J}{g \cdot K}$; $c_{water}=4.2 \frac{J}{g \cdot K}$; $\Delta H_{fus(water)}$=6.00kJ/mol; $\Delta H_{vap(water)}$=42kJ/mol

T_{final}= 0°C we are still melting

$q_{Fe}=m_{Fe}c_{Fe}\Delta T_{Fe}$= -10kJ energy provided by the iron

$q_{fusion(ice-water)} = \Delta H_{fus(water)}$=2moles *6.00kJ/mol= 12.0kJ energy needed to completely melt all of the ice(2mols)

$q_{ice}= m_{ice}c_{ice}\Delta T_{ice}$=1.44kJ energy needed to increase temperature of ice from -20 °C to 0 °C