

Discussion Quiz #8

Your Name: _____key_____

TF's name: _____ Discussion /Day/Time: _____

1. (2 points) An ice cube, initially at -20°C , with mass 36 grams is placed on top of a 1000. g iron plate ($c_p = 1 \frac{\text{J}}{\text{g} \cdot \text{K}}$). If the temperature of the iron plate drops by 10°C , what is the final temperature of the H_2O . ($c_{\text{ice}} = 2 \frac{\text{J}}{\text{g} \cdot \text{K}}$, $\Delta H_{\text{fus}(\text{water})} = 6.00 \text{kJ/mol}$)? (Hint: drawing the heating curve may help you)

$T_{\text{final}} = 0^{\circ}\text{C}$ we are still melting

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

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

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

2. (3 points) A process is *exothermic*, circle all that MUST be true.

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

3. (5 points) A process is *exothermic* and *gas is consumed*, circle all that MUST be true.

$w > 0$ (1point each) The surroundings get hot.

$q_v > q_p$ (1point) $|q_v| < |q_p|$ (1point)

T_{final} (constant pressure) $>$ T_{final} (constant volume) (1point)