

Name: _____

date: _____

period: _____

ch. 10 sea level rise; heat, heating curve

test ⁵⁰ 55 points

ngss chemistry

In problems involving any calculation, show your work in an organized manner, include (i) any relevant equation (or formula), (ii) conversion factor(s), (iii) put the proper units in your calculations and answer.

1. Based on HW ch. 10.1b; ii: in regards to sea level rise, [10 points]

a. What is the difference between an iceberg versus glacier?

in ocean on land

b. What is the relative contribution of an iceberg versus a glacier in sea level rise?

less more

c. What is / are the factor(s) that contribute to sea level rise?

amount glacier melt

thermal expansion = $\uparrow T \rightarrow \uparrow V \rightarrow \uparrow$ sea level rise

2. Based on HW ch. 10.1a; iv & thermo lab: what is the "final" temperature when you add 125 g of gold at 88 °C to 45 g of water at 21 °C? [hint: specific heat of gold = 0.129 J/(g °C) 10 points]

125g 88°C Au 45g 21°C H₂O

4 pt

$$m_c c_c (T_f - T_{i,c}) = -m_h c_h (T_f - T_{i,h})$$

$$125 \text{ g} \cdot 0.129 \frac{\text{J}}{\text{g} \cdot ^\circ\text{C}} (T_f - 88) = -45 (4.18) (T_f - 21)$$

$$16.125 T_f - 1419 = -188.1 T_f + 3950.1$$

$$204.225 T_f = 5369.1$$

$$T_f = 26.3^\circ\text{C}$$

3. Based on thermo lab and weekly quiz: what is the final temperature of mixing 25 g water at 21 °C and 35 g water at 88 °C? [15 points]

25g 21°C cold 35g 88°C hot

4 pt

$$m_c c_c (T_f - T_{i,c}) = -m_h c_h (T_f - T_{i,h})$$

$$25 (T_f - 21) = -35 (T_f - 88)$$

$$25 T_f - 525 = -35 T_f + 3080$$

$$60 T_f = 3605$$

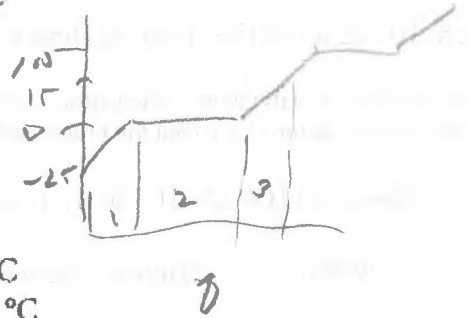
$$T_f = 60.1^\circ\text{C}$$

4. Based weekly quiz: using the below information,

Heat (enthalpy) of fusion: 6.008 kJ/mol at 0 °C

Heat (enthalpy) of vaporization: 44.94 kJ/mol at 0 °C
44.02 kJ/mol at 25 °C
40.67 kJ/mol at 100 °C

Specific heat: 2.092 J/g-K = 2.092 J/g·°C for ice at -3 °C
4.184 J/g-K = 4.184 J/g·°C for water at 25 °C
1.841 J/g-K = 1.841 J/g·°C for steam at 100 °C



determine the amount of heat, where 235 grams of (solid) ice at -25 °C becomes (liquid) water at 15 °C ?
[20 points]

i) $Q_1 = m c_s \Delta T_s = 235g \left(\frac{2.092 \text{ J}}{\text{g} \cdot ^\circ\text{C}} \right) 25^\circ\text{C} = 12278 \text{ J}$
or
12.278 kJ

ii) $Q_2 = \Delta H_{\text{fusion}} m = 6.01 \frac{\text{kJ}}{\text{mol}} \cdot 235g \frac{\text{mol}}{18g} = 78.5 \text{ kJ}$

iii) $Q_3 = m c_l \Delta T_l = 235g \left(\frac{4.184 \text{ J}}{\text{g} \cdot ^\circ\text{C}} \right) 15^\circ\text{C} = 14734 \text{ J}$
14.7 kJ

iv) $Q = \Sigma Q_i = 105 \text{ kJ}$