

Homework

1. Al

$$m = 100 \text{ g}$$

$$t_i = 100^\circ\text{C}$$

$$t_f = 25^\circ\text{C}$$

$$C = 0.900 \frac{\text{J}}{\text{g}^\circ\text{C}}$$

H₂O

$$t_i = 20^\circ\text{C}$$

$$t_f = 25^\circ\text{C}$$

$$m = ?$$

$$C = 4.19 \frac{\text{J}}{\text{g}^\circ\text{C}}$$

$$q_{\text{sys}} = -q_{\text{surr}}$$

$$q_{\text{Al}} = -q_{\text{H}_2\text{O}}$$

$$m \Delta t = -m C \Delta t$$

$$\frac{(100 \text{ g}) \left(0.900 \frac{\text{J}}{\text{g}^\circ\text{C}} \right) (-75)}{-(4.19)(5)} = \frac{m \left(4.19 \frac{\text{J}}{\text{g}^\circ\text{C}} \right) (5)}{(4.19)(5)}$$

$$322 \text{ g} = m$$

$$2. m_s = 100g$$

$$t_{is} = 100^\circ\text{C}$$

$$t_f = 23.395^\circ\text{C}$$

$$C_s = ?$$



$$m = 100g$$

$$t_i = 20^\circ\text{C}$$

$$t_f = 23.395^\circ\text{C}$$

$$C = 4.19$$

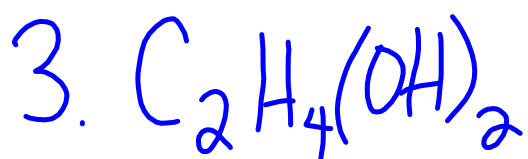
$$q_{\text{sys}} = -q_{\text{surv}}$$

$$q_{\text{sub}} = -q_{\text{H}_2\text{O}}$$

$$mC\Delta t = -mC\Delta t$$

$$\frac{(100g)(C)(-76.605)}{(100g)(-76.605)} = -\frac{(100)(4.19)(3.395)}{(100g)(-76.605)}$$

$$C = +0.186 \frac{\text{J}}{\text{g}^\circ\text{C}}$$



$n = 1 \text{ mol}$

$H_{\text{cond}} = -58.8 \frac{\text{kJ}}{\text{mol}}$

H_2O
 $t_i = 20^\circ\text{C}$

$t_f = 50^\circ\text{C}$

$m = ?$

A

$\Delta H_{\text{sys}} = -q_{\text{surr}} \quad C = 4.19 \frac{\text{J}}{\text{g}^\circ\text{C}}$

$$n H_{\text{sys}} = -m C \Delta t$$

$$\frac{(1)(58.8 \frac{\text{kJ}}{\text{mol}})}{-(4.19)(30)} = \frac{(m)(4.19)(30)}{-(4.19)(30)}$$

$$\frac{-58.800 \text{ J}}{-(4.19)(30)} \quad m = \underline{468 \text{ g}}$$

4. Cu

$$t_{icu} = 1083^{\circ}\text{C}$$

$$t_f = ?$$

$$C = 0.385 \frac{\text{J}}{\text{g}^{\circ}\text{C}}$$

$$n = 1 \text{ mol} \times \frac{63.55 \text{ g}}{1 \text{ mol}}$$

H₂O

$$5 \text{ mol} = n$$

$$t_i = 20^{\circ}\text{C}$$

$$t_f = ?$$

$$C = 4.19 \frac{\text{J}}{\text{g}^{\circ}\text{C}}$$

$$5 \text{ mol} \times \frac{18.02 \text{ g}}{1 \text{ mol}}$$

$$m = 90.1 \text{ g}$$

$$q_{\text{sys}} = -q_{\text{surr}}$$

$$m C \Delta t = -m C \Delta t$$

$$(63.55)(0.385)(t_f - 1083) = -(90.1)(4.19)(t_f - 20)$$

$$(63.55)(0.385)(x - 1083) = -(90.1)(4.19)(x - 20)$$

$$24.47(x - 1083) = -377.5(x - 20)$$

$$24.47x - 26501.1 = -377.5x + 7550$$

$$24.47x + 377.5x = 7550 + 26501.1$$

$$\frac{401.97x}{401.97} = \frac{34051.01}{401.97}$$

$$x = 84.7^{\circ}\text{C}$$

$$5. \text{ Hg}$$

$$m = 50 \text{ g} \times \frac{1 \text{ mol}}{200.59 \text{ g}}$$

$$n = 0.249$$

$$\underline{\underline{H_{\text{fus}}}}$$

$$\text{H}_2\text{O}$$

$$m = 500 \text{ g}$$

$$\Delta t = 50^\circ \text{C}$$

$$C = 4.19$$

$$\Delta H_{\text{fus Hg}} = -q_{\text{H}_2\text{O}}$$

$$n H_{\text{fus}} = -m C \Delta t$$

$$\frac{(0.249)(H_{\text{fus}})}{0.249} = - \frac{(500)(4.19)(50)}{0.249}$$

$$H_{\text{fus Hg}} = +420236 \frac{\text{J}}{\text{mol}}$$

$$+421 \text{ kJ/mol}$$

$$-420 \frac{\text{kJ}}{\text{mol}}$$

Homework

Worksheet

Lab Prep

Find the molar masses for:

