

Review Answers.

1] Find Q

$$m = 250 \text{ g}$$

$$\Delta T = -1.02 \text{ }^\circ\text{C}$$

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

$$Q = mc\Delta T$$
$$= (250)(4.19)(-1.02)$$

$$Q = \underline{-1068.45 \text{ J}}$$

Find n

$$m = 7 \text{ g}$$

$$M = 132.9 \text{ g/mol}$$

$$n = m/M$$

$$= 7.0/132.9$$

$$n = \underline{0.053 \text{ mol}}$$

$$\Delta H_x = -Q/n$$
$$= \frac{1068.45 \text{ J}}{0.053 \text{ mol}}$$

$$= 20159.4 \text{ J/mol}$$

$$= \boxed{20.16 \text{ kJ/mol}}$$

2] Find Q

$$Q \text{ was given, } \underline{100 \text{ J}}$$

$$\Delta H_x = -Q/n$$

$$\Delta H_x = -100/0.40 \text{ mol}$$

$$\Delta H_x = -250 \text{ J/mol}$$

$$= \boxed{-0.25 \text{ kJ/mol}}$$

Find n

$$m = 12.7 \text{ g}$$

$$M = 32.065$$

$$n = m/M$$

$$n = 12.7/32.065$$

$$n = \underline{0.40 \text{ mol}}$$

[3]

Find Q

$$m = 250 \text{ g}$$

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

$$\Delta T = 85 - (-6) = 91^\circ\text{C}$$

$$Q = mc\Delta T$$

$$Q = (250)(4.19)(91) \\ = \underline{95322.5 \text{ J}}$$

Find m

$$n = 0.027 \text{ mol}$$

$$M = 5(12.01) + 12(16.01) = 72.17 \text{ g/mol}$$

$$m = n \times M$$

$$= 72.17 \text{ g/mol} \times 0.027 \text{ mol}$$

$$\boxed{m = 1.95 \text{ g}}$$

Find n

$$\Delta H_{rx} = -3509.0 \text{ kJ/mol}$$

$$Q = 95322.5 \text{ J}$$

$$\text{OR } 95.32 \text{ kJ}$$

$$n = -Q / \Delta H_{rx}$$

$$n = \frac{-95.32}{-3509}$$

$$\underline{n = 0.027 \text{ mol}}$$



Equation 1 x 2



Equation 2 x 3

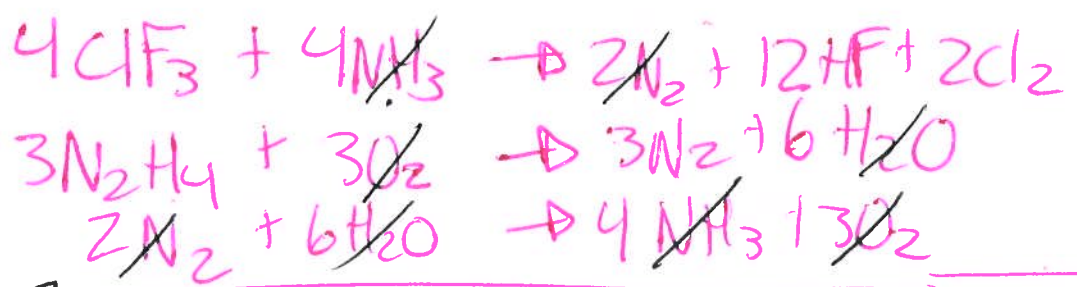


Equation 3 x -1



Combine

- $\Delta H = -2392$
- $\Delta H = -1866$
- $\Delta H = 1530$



$\Delta H = -2728 \text{ kJ}$



5a



$$\Delta H = \sum (1)(-411.0) + (1)(-291.8) - \sum (1)(-426.7) + (1)(-92.3)$$

$$\Delta H = -133.8 \text{ kJ}$$

5b



$$\Delta H = \sum (1)(-393.5) + (2)(-285.8) - \sum (1)(-74.8) + (2)(0)$$

$$\Delta H = -890.3 \text{ kJ/mol}$$

5c



$$\Delta H = \sum (2)(-285.8) + (2)(-296.1) - \sum (2)(-202.1) + (3)(0)$$

$$\Delta H = -1123.6 \text{ kJ/mol}$$

5d



$$\Delta H = \sum (2)(33.9) - \sum (2)(90.4) + (1)(0)$$

$$\Delta H = -113.0 \text{ kJ/mol}$$

$$\boxed{6} \quad \text{Rate} = k[A]^m[B]^n$$

$$k = 1.8 \times 10^{-4}$$

m, n are 1st order, so assume 1

$$[A] = 2.0 \text{ M}$$

$$[B] = 4.0 \text{ M}$$

$$\text{Rate} = (1.8 \times 10^{-4})(2.0)^1(4.0)^1$$

$$\text{Rate} = 0.00144$$

OR

$$1.44 \times 10^{-3} \text{ mol}^2 / \text{L}^2 \cdot \text{s}^2$$

