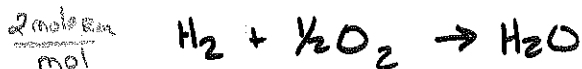


Given:



$$\Delta H_{\text{rxn}}^\circ = -393 \text{ kJ/mol rxn}$$



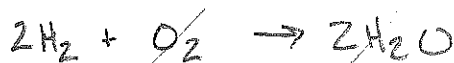
$$\Delta H_{\text{rxn}}^\circ = -286 \text{ kJ/mol rxn}$$



$$\Delta H_{\text{rxn}}^\circ = -892 \text{ kJ/mol rxn}$$



$$\Delta H^\circ = -393 \text{ kJ/mol}$$



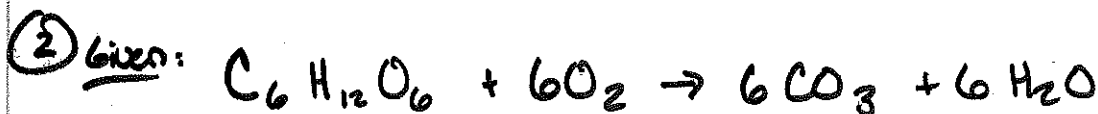
$$\Delta H^\circ = -572 \text{ kJ/mol}$$



$$\Delta H^\circ = +892 \text{ kJ/mol}$$



$$\Delta H_f^\circ = -73 \text{ kJ/mol}$$



$$\Delta H_f^\circ \quad -1275.0 \quad \emptyset \quad -393.5 \quad -285.8$$

$$\Delta H_{\text{comb}}^\circ = \sum H_{\text{f products}}^\circ - \sum H_{\text{f reactants}}^\circ$$

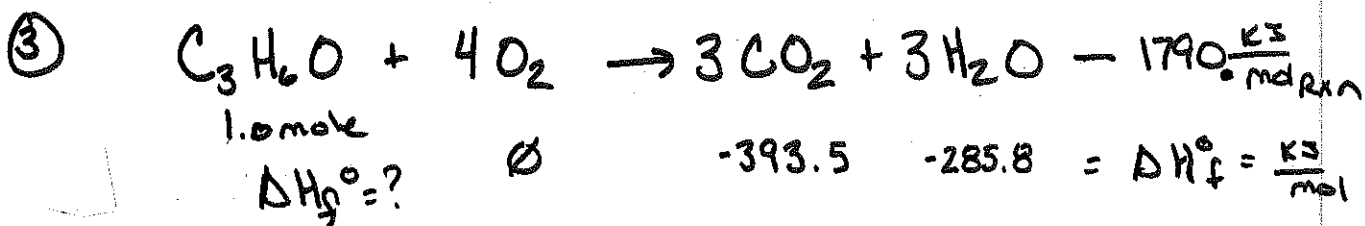
$$= \left[\frac{6 \text{ mol}}{\text{mol rxn}} \left(-393.5 \frac{\text{kJ}}{\text{mol}} \right) + \frac{6 \text{ mol}}{\text{mol rxn}} \left(-285.8 \frac{\text{kJ}}{\text{mol}} \right) \right]$$

$$- \left[\frac{1 \text{ mol}}{\text{mol rxn}} \left(-1275.0 \frac{\text{kJ}}{\text{mol}} \right) \right]$$

$$\Delta H_{\text{comb}}^\circ = -4076 \frac{\text{kJ}}{\text{mol rxn}} - \left(-1275.0 \frac{\text{kJ}}{\text{mol rxn}} \right)$$

$$\Delta H_{\text{comb}}^\circ = -2801 \text{ kJ/mol rxn}$$





$$\Delta H_{\text{comb}}^\circ \text{C}_3\text{H}_6\text{O} = \sum H_f^\circ \text{products} - \sum H_f^\circ \text{reactants}$$

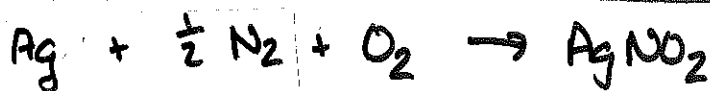
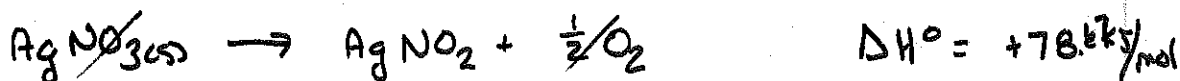
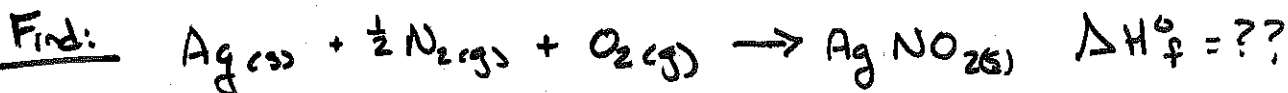
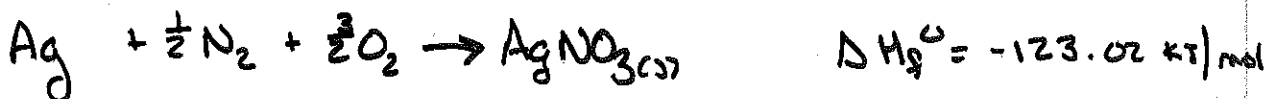
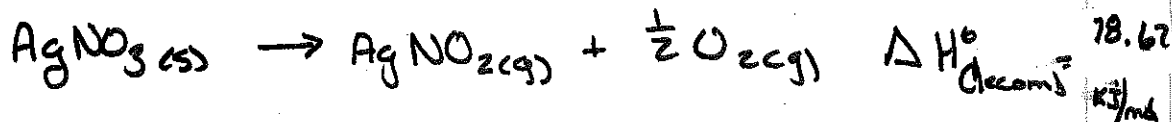
$$\sum H_f^\circ \text{products} = \sum H_f^\circ \text{products} - \Delta H_{\text{comb}}^\circ \text{C}_3\text{H}_6\text{O}$$

$$\Delta H_f^\circ \text{C}_3\text{H}_6\text{O} + 0 = \left[\frac{3\text{mol}}{\text{mol rxn}} \left(-393.5 \frac{\text{kJ}}{\text{mol}} \right) + \frac{3\text{mol}}{\text{mol rxn}} \left(-285.8 \right) \right] - \left[-1790 \frac{\text{kJ}}{\text{mol rxn}} \right]$$

$$= -2037.9 \frac{\text{kJ}}{\text{mol rxn}} + 1790 \frac{\text{kJ}}{\text{mol rxn}}$$

$$\Delta H_f^\circ \text{C}_3\text{H}_6\text{O} = -248 \frac{\text{kJ}}{\text{mol}}$$

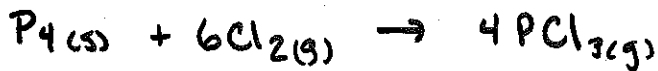
4 Given:



$$\Delta H_f^\circ = -44.35 \frac{\text{kJ}}{\text{mol}}$$



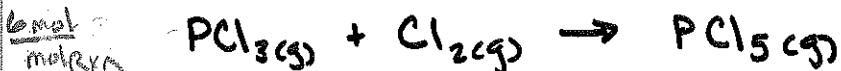
Given:



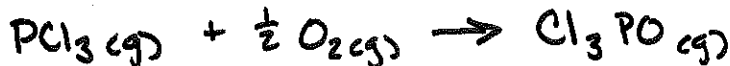
$\Delta H^\circ = -1225.6 \text{ kJ/mole rxn}$



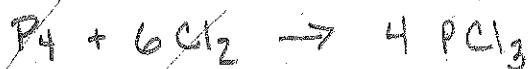
$\Delta H^\circ = -2967.3 \text{ kJ/mole rxn}$



$\Delta H^\circ = -84.2 \text{ kJ/mole rxn}$



$\Delta H^\circ = -285.7 \text{ kJ/mole rxn}$



$\Delta H^\circ = -1225.6 \text{ kJ/mole rxn}$



$\Delta H^\circ = 2967.3 \text{ kJ/mole rxn}$



$\Delta H = 505.2 \text{ kJ/mole rxn}$



$\Delta H = -2857. \text{ kJ/mole rxn}$

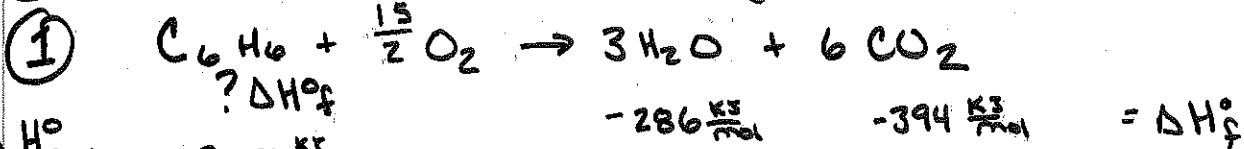


$\Delta H^\circ = -610. \text{ kJ/mole rxn}$

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS



6 * Can solve 2 different ways!



$\Delta H_{comb}^\circ = -3271 \frac{kJ}{mol_{rxn}}$
 C_6H_6

Soln: $\Delta H_{comb}^\circ = \sum \Delta H_f^\circ \text{ products} - \sum H_f^\circ \text{ reactants}$
 C_6H_6

$\sum H_f^\circ \text{ reactants} = \sum \Delta H_f^\circ \text{ products} - \Delta H_{comb}^\circ$
 C_6H_6

$\Delta H_f^\circ C_6H_6 + \frac{15}{2} (0) = \left[\frac{3 \text{ mol}}{\text{mol}_{rxn}} (-286 \frac{kJ}{mol}) + \frac{6 \text{ mol}}{\text{mol}_{rxn}} (-394 \frac{kJ}{mol}) \right]$

$\Delta H_f^\circ C_6H_6 = -3222 \frac{kJ}{mol_{rxn}} - (-3271 \frac{kJ}{mol_{rxn}}) = -3271 \frac{kJ}{mol_{rxn}}$

$= 49 \text{ kJ/mol}_{rxn}$

2nd way



- * $\frac{1 \text{ mol}}{\text{mol}_{rxn}}$ R $C_6H_6 + \frac{15}{2} O_2 \rightarrow 6CO_2 + 3H_2O$ $\Delta H_f^\circ = -3271 \frac{kJ}{mol}$
- * $\frac{6 \text{ mol}}{\text{mol}_{rxn}}$ $C + O_2 \rightarrow CO_2$ $\Delta H_f^\circ = -394 \frac{kJ}{mol}$
- * $\frac{3 \text{ mol}}{\text{mol}_{rxn}}$ $H_2 + \frac{1}{2} O_2 \rightarrow H_2O$ $\Delta H_f^\circ = -286 \frac{kJ}{mol}$

