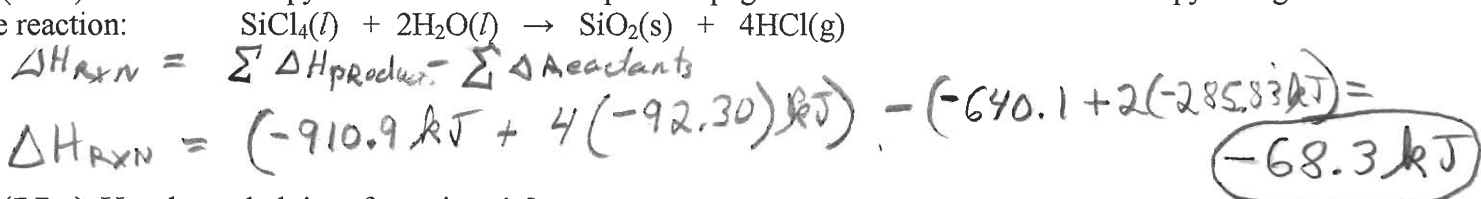


**SHOW ALL WORK TO RECEIVE CREDIT.**

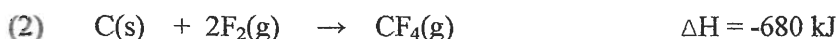
Enthalpy values (kJ/mol):  $\text{H}_2\text{O}(l)$  -285.83;  $\text{HCl}(g)$  -92.30;  $\text{SiCl}_4(l)$  -640.1;  $\text{SiO}_2(s)$  -910.9

Molar masses: H 1.008; C 12.01

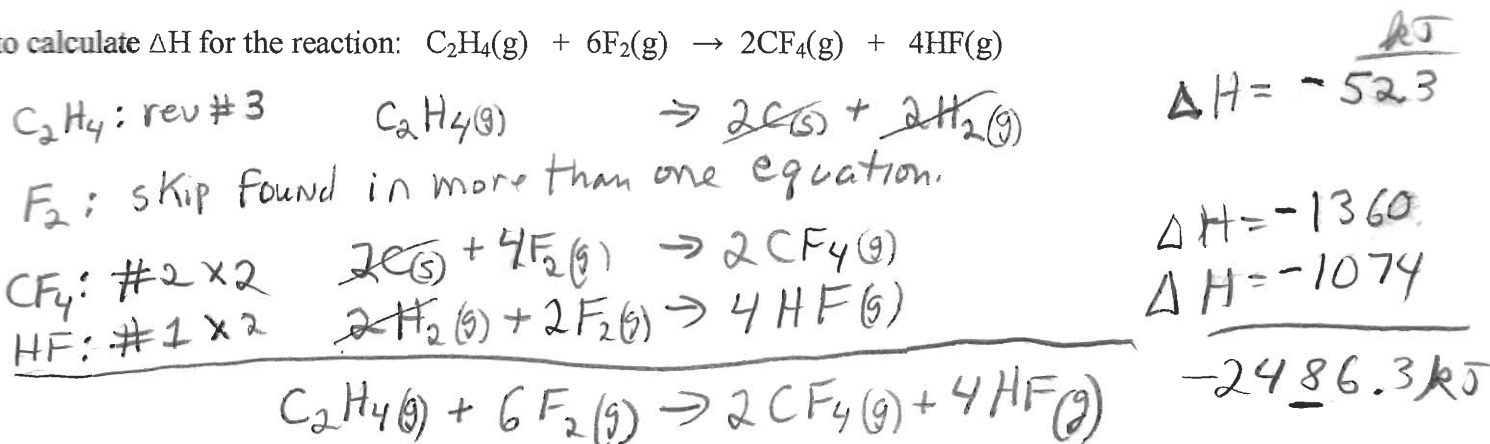
1. (4 Pts) Use the enthalpy values listed on the top of the page to calculate the standard enthalpy change for the reaction:



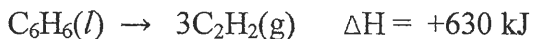
2. (7 Pts) Use the enthalpies of reaction 1-3



to calculate  $\Delta H$  for the reaction:  $\text{C}_2\text{H}_4(g) + 6\text{F}_2(g) \rightarrow 2\text{CF}_4(g) + 4\text{HF}(g)$



3. (5 Pts) Calculate the enthalpy change that occurs when 45.0 grams of  $\text{C}_6\text{H}_6(l)$  undergoes the decomposition reaction shown below:



$$\frac{45.0 \text{ g C}_6\text{H}_6}{78.108 \text{ g/mol}} \times \frac{+630 \text{ kJ}}{\text{mol C}_6\text{H}_6} = \Delta H = \underline{+363 \text{ kJ}}$$

4. (4 Pts) The specific heat ethylene glycol is 2.42 J/g·K. Determine how many J of heat are needed to raise the temperature of 454 g ethylene glycol from 14.0 °C to 212 °C.

$$\frac{2.42 \text{ J}}{\text{g} \cdot \text{K}} \times \frac{454 \text{ g}}{1} \times (212 - 14) \text{ }^\circ\text{C} = \underline{218,000 \text{ J}}$$

5. (5 Pts) The specific heat of iron is 0.450 J/g·K. If 455 J of heat are added to 25.0 grams of iron at 25.0 °C, what will be the final temperature of the iron?

Gives  $\rightarrow \Delta T$

$$\frac{\text{g} \cdot \text{K}}{0.450 \text{ J}} \times \frac{455 \text{ J}}{1} = 40.4 \text{ K}$$

$$\begin{array}{r} 25.0 \\ + 40.4 \\ \hline \boxed{65.4 \text{ }^\circ\text{C}} \end{array}$$