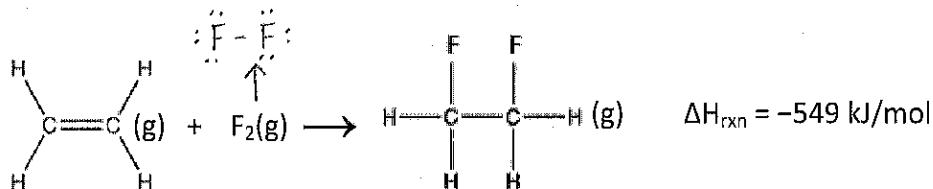
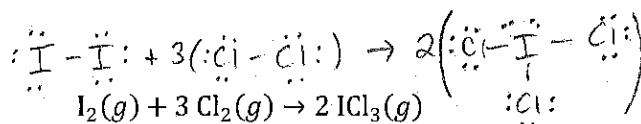


2. Estimate the carbon-fluorine bond energy given the remaining bond energies provided in the reference chart and the information provided in the equation below. Does the reaction illustrate an endothermic or exothermic process?



$$\begin{aligned}
 \Delta H_{\text{rxn}}^{\circ} &= \sum \text{BE}(\text{re}) - \sum \text{BE}(\text{pr}) \\
 -549 &= [4(\text{C-H}) + \text{C}=\text{C} + (\text{F}-\text{F})] - [4(\text{C-H}) + \text{C}-\text{C} + 2(\text{C}-\text{F})] \\
 &= [614 + 154] - [347 + 2(\text{C}-\text{F})] \\
 &= 421 - 2(\text{C}-\text{F}) \\
 \Rightarrow \text{C}-\text{F} &= \frac{549 + 421}{2} = \boxed{485 \frac{\text{kJ}}{\text{mol}_{\text{rxn}}}}
 \end{aligned}$$



3. According to the data in the table below, what is the value of ΔH° for the reaction represented above?

Bond	Average Bond Energy (kJ/mol)
I-I	150
Cl-Cl	240
I-Cl	210

- a. -870 kJ/mol (b.) -390 kJ/mol c. +180 kJ/mol d. +450 kJ/mol

$$\begin{aligned}
 \Delta H_{\text{rxn}}^{\circ} &= \sum \text{BE}(\text{re}) - \sum \text{BE}(\text{prod}) \\
 &= [\text{I}-\text{I} + 3(\text{Cl}-\text{Cl})] - [6(\text{I}-\text{Cl})] \\
 &= [150 + 3(240)] - [6(210)] \\
 &= 150 + 720 - 1260 = 870 - 1260 = \boxed{-390 \text{ kJ/mol}_{\text{rxn}}}
 \end{aligned}$$