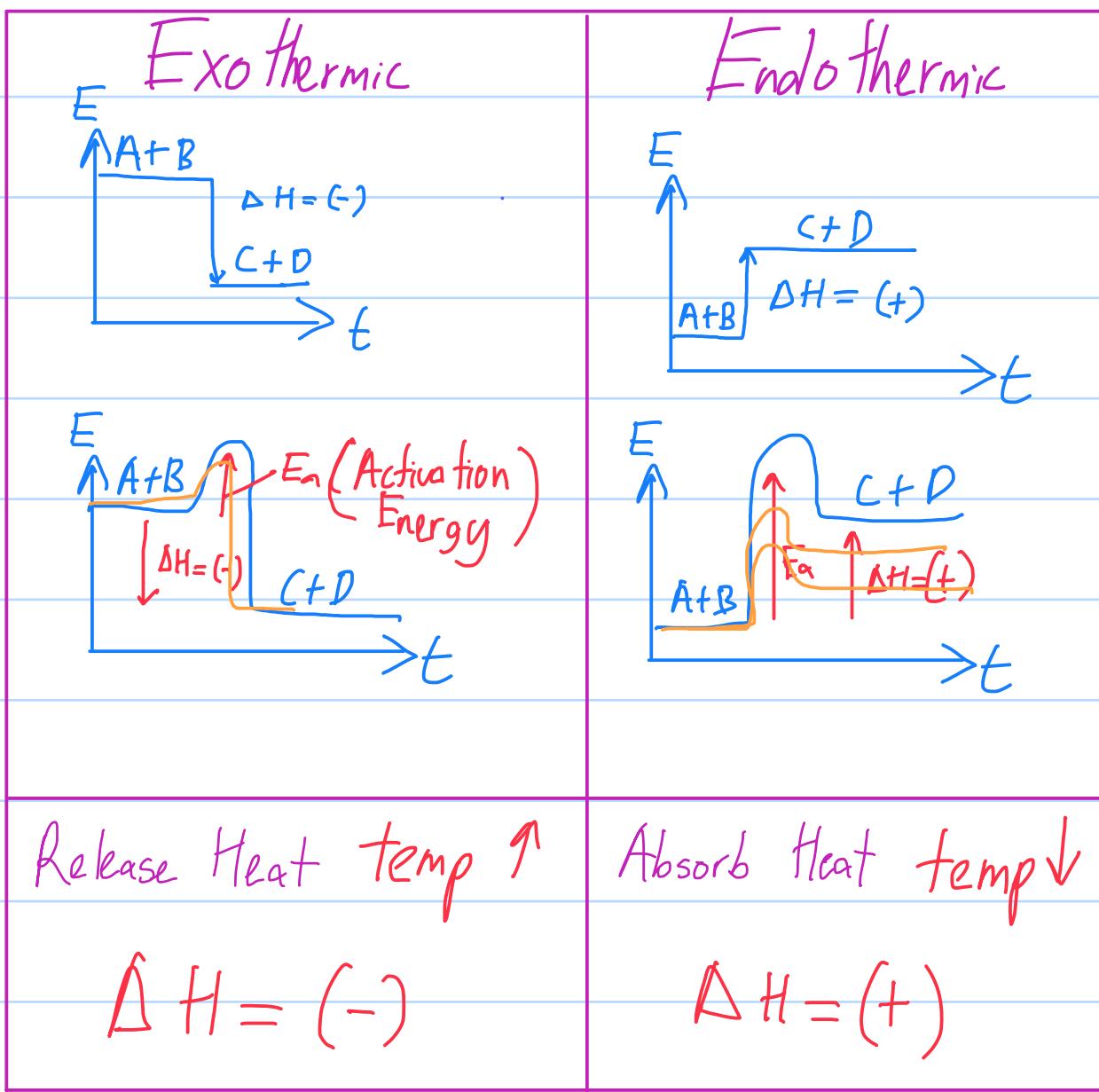


Chemical Energetics



ΔH : the enthalpy change.

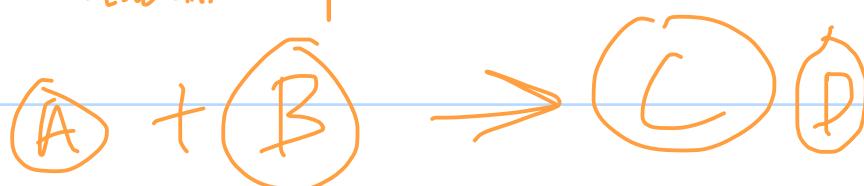
Bond energy equation

$$\Delta H = E_B - E_F$$

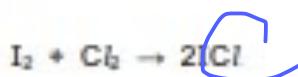
if $\Delta H = (+)$, endo

if $\Delta H = (-)$, exo

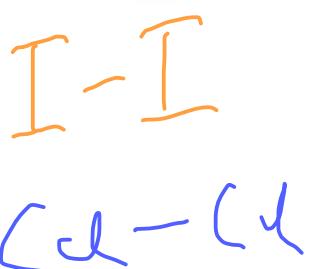
reactant products



- (d) Calculate the overall energy change for the reaction between iodine and chlorine using the bond energy values shown.



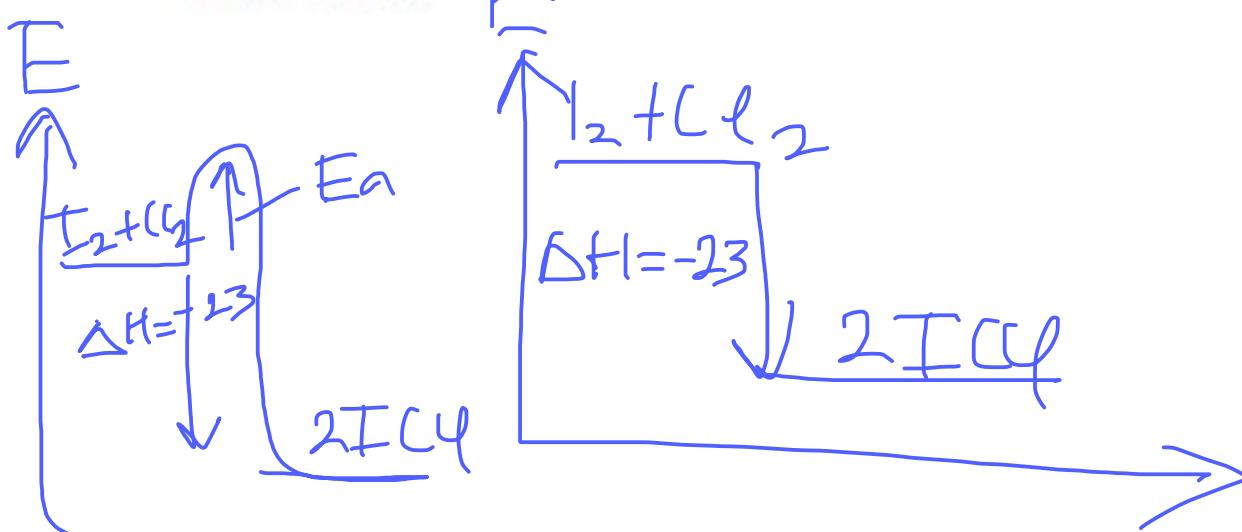
| Bond | Energy / kJ per mol |
|-------|---------------------|
| I-I | 151 |
| Cl-Cl | 242 |
| I-Cl | 208 |



Show your working.

$$\begin{array}{l}
 E_B = 151 + 242 \\
 = 393 \\
 E_F = 2 \times 208 = 416
 \end{array}
 \quad \left| \begin{array}{l}
 \Delta H = E_B - E_F \\
 = 393 - 416 \\
 = -23
 \end{array} \right. \quad [3]$$

- (e) Draw a labelled energy level diagram for the reaction between iodine and chlorine using the information in (d).



[2]

[Total: 10]

