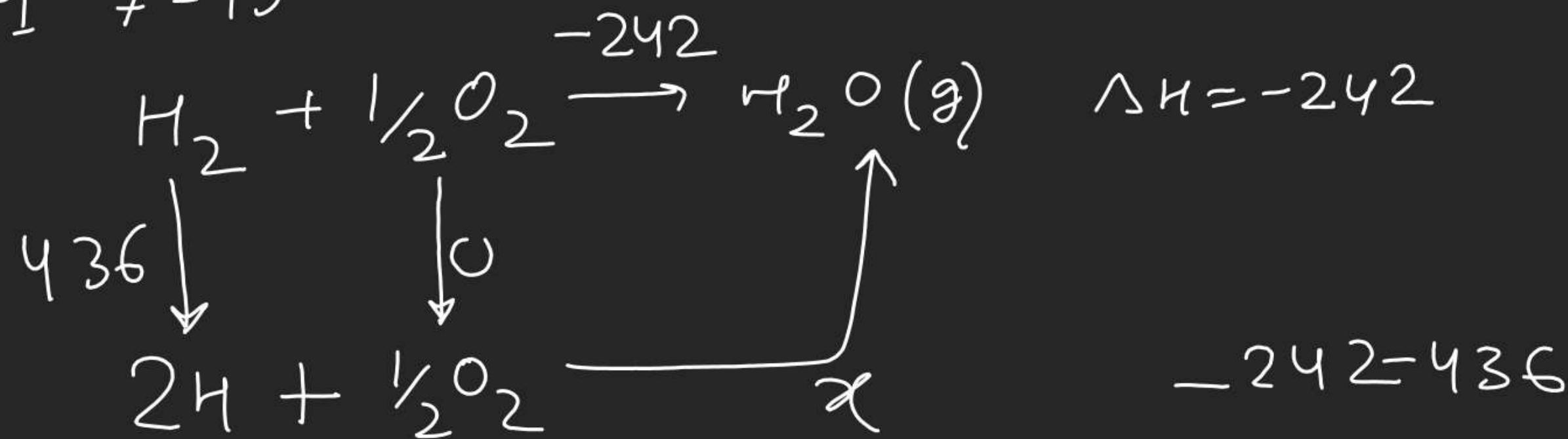


THERMOCHEMISTRY

0-1 8-20

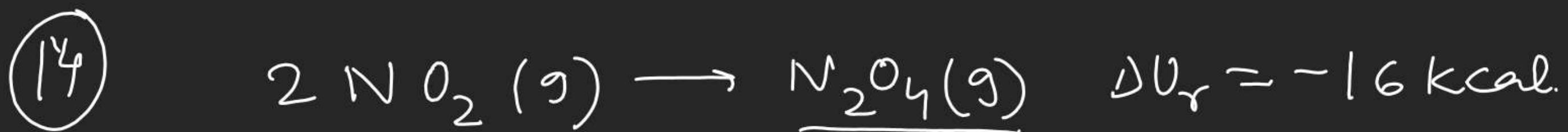
S-1 7-15



$$436 + 0 + x = -242$$

$$\chi = -242 - 436$$

THERMOCHEMISTRY



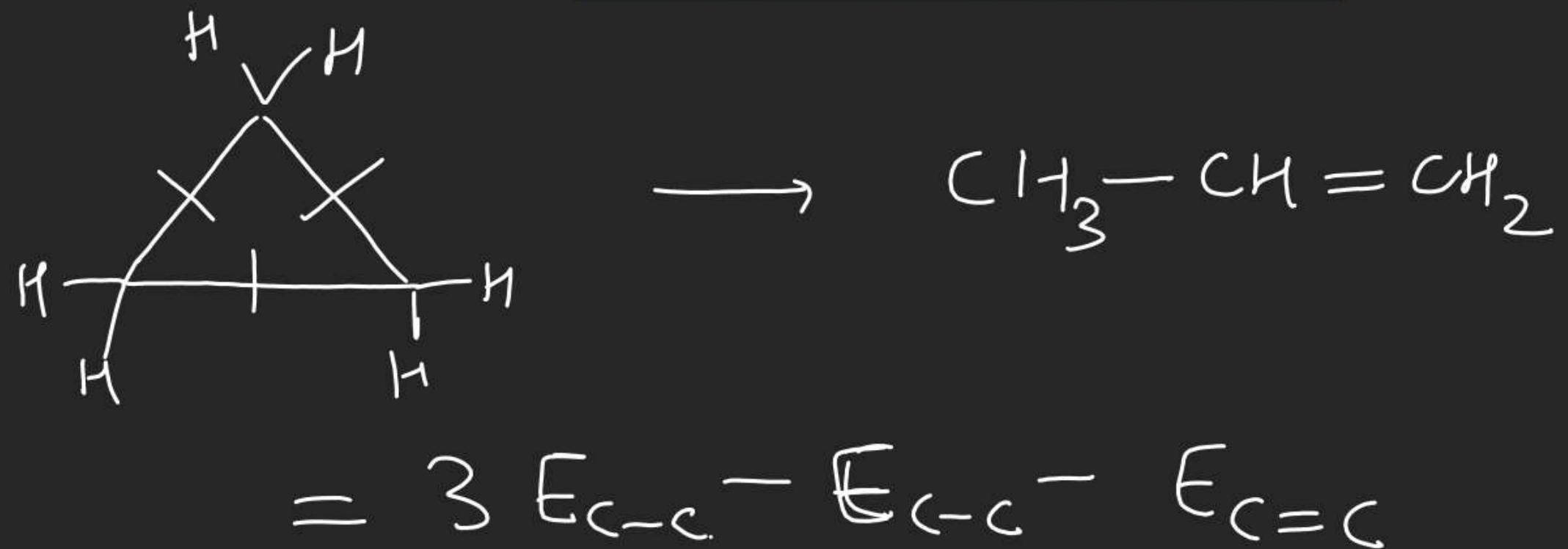
$$\Delta U_r = -16 = 2 - 2 \Delta U_f(\text{NO}_2)$$

$$\Delta U_f(\text{NO}_2) = 9$$



$$\Delta H = 9 + \frac{(-\frac{1}{2}) \times R \times 1000}{1000}$$

THERMOCHEMISTRY



THERMOCHEMISTRY

S-I ~~Q~~ ~~T~~

$$|Q| = 17.7 \times \Delta T = 17.7 \times 0.5 = 8.85 \text{ kJ}$$

0.16 gm
CH₄

$$|\Delta u| = \frac{8.85}{n} = \frac{8.85}{0.01} = 885 \text{ kJ/mol}$$

$$\Delta U = -885 \text{ kJ/mol}$$



$$\Delta H = -885 + \frac{(-2) \times R \times 300}{1000}$$

THERMOCHEMISTRY

⑧ $|Q| = 1200 \times 0.25$

$$|Q| = 300 \text{ cal}$$

$$\Delta H = |Q_m| = -200 \text{ kcal}$$

$$|Q_m| = \frac{Q}{n}$$

$$n = \frac{300}{200 \times 1000}$$

THERMOCHEMISTRY

(15)



$$\text{BE}_{\text{S-S}} = \Delta H_f = \Delta H_f(\text{Pr}) - \Delta H_f(\text{R})$$

THERMOCHEMISTRY

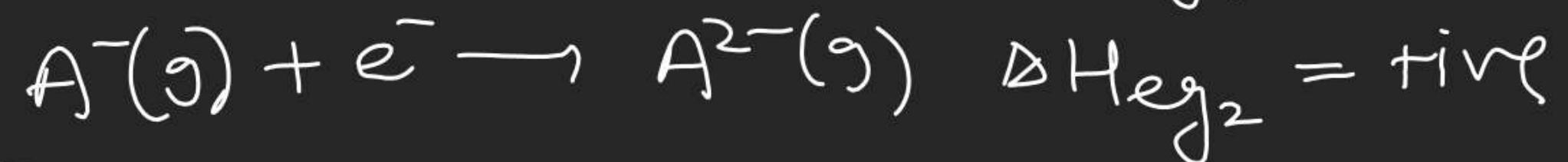
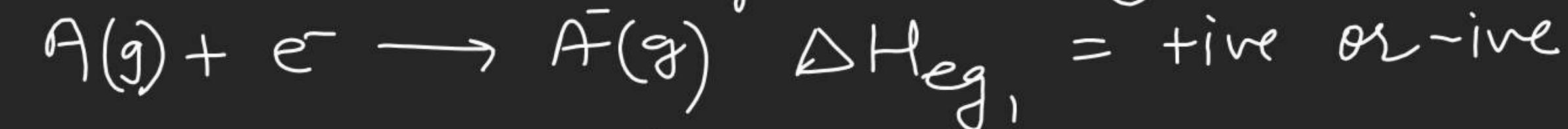


$$(IE)_T - (IE)_0 = \frac{5}{2}RT(T_0)$$

$$\text{Ionisation energy} = (IE)_T - \frac{5}{2}RT$$

THERMOCHEMISTRY

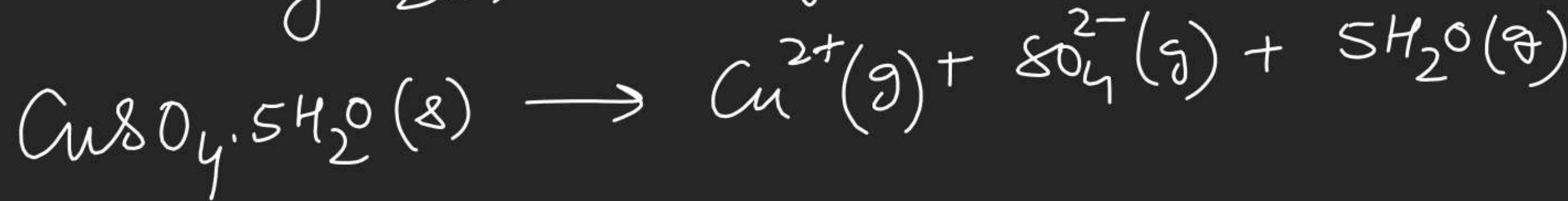
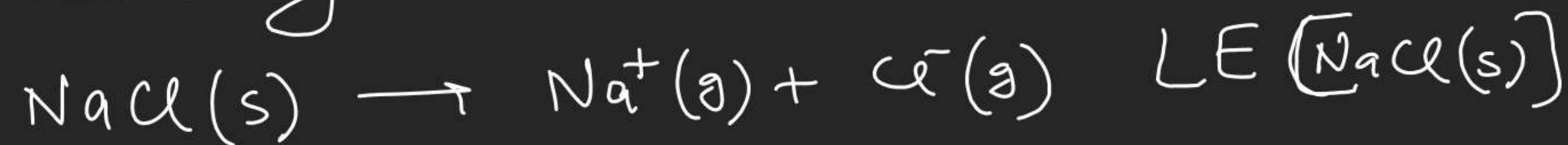
Electron gain enthalpy : \rightarrow Enthalpy change when an e^- is added to each of 1 mol of isolated gaseous atoms



Electron affinity (EA) = $- (\Delta H_{eg})_{OK}$

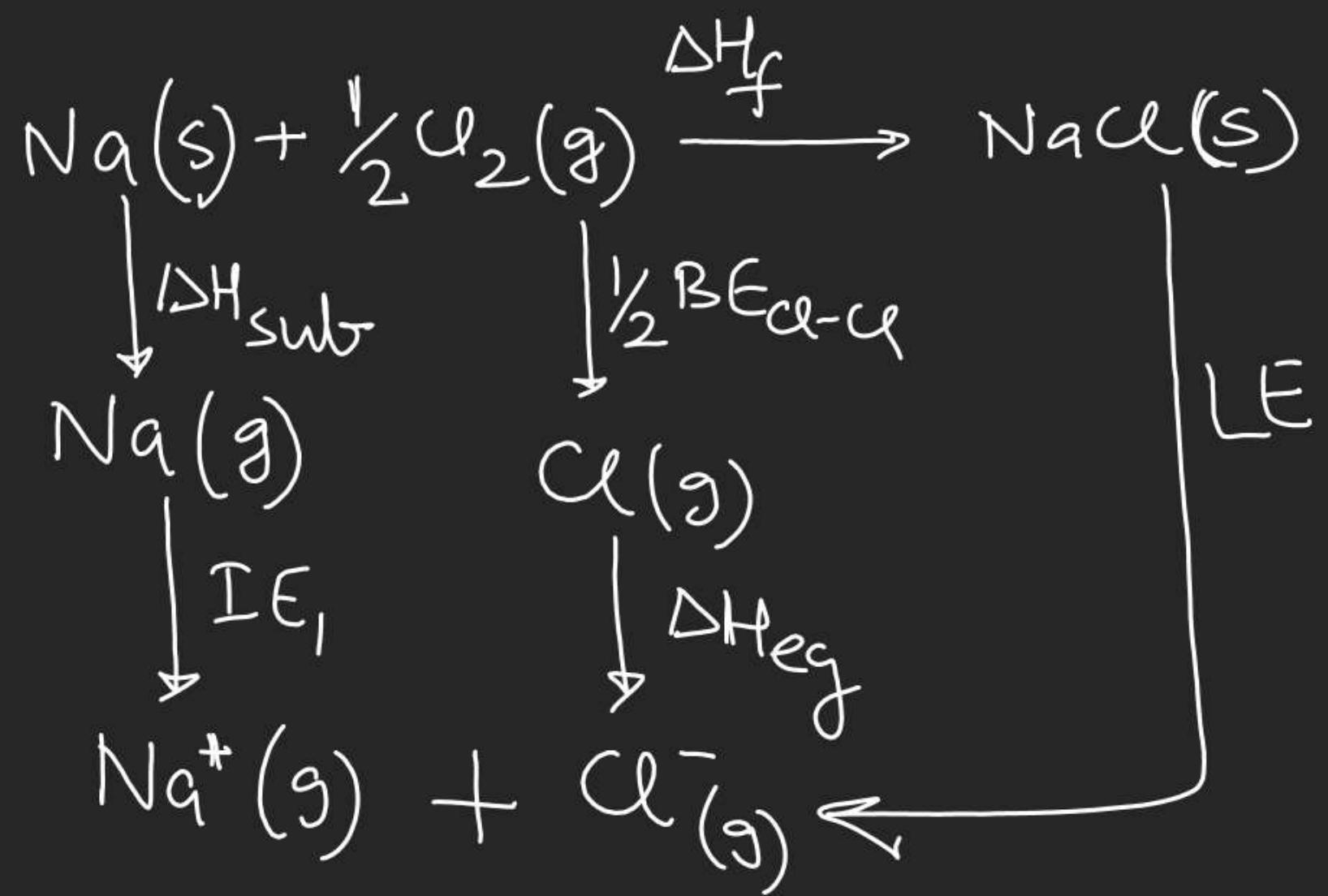
THERMOCHEMISTRY

Lattice enthalpy :- Enthalpy change when 1mol ionic compound is converted into its constituents gaseous ions.



THERMOCHEMISTRY

Born Haber cycle



$$\begin{aligned}
 \Delta H_f^{\circ} + LE &= \Delta H_{\text{sub}} + DE_1 \\
 &\quad + \frac{1}{2}BE_{\text{Cl-}} \\
 &\quad + \Delta H_{\text{deg}}
 \end{aligned}$$

THERMOCHEMISTRY

Enthalpy of hydration : $\rightarrow (\Delta H_{\text{hyd}})$: It is the enthalpy change when 1 mol anhydrous or partially hydrated ionic compound is converted into its higher hydrated form.

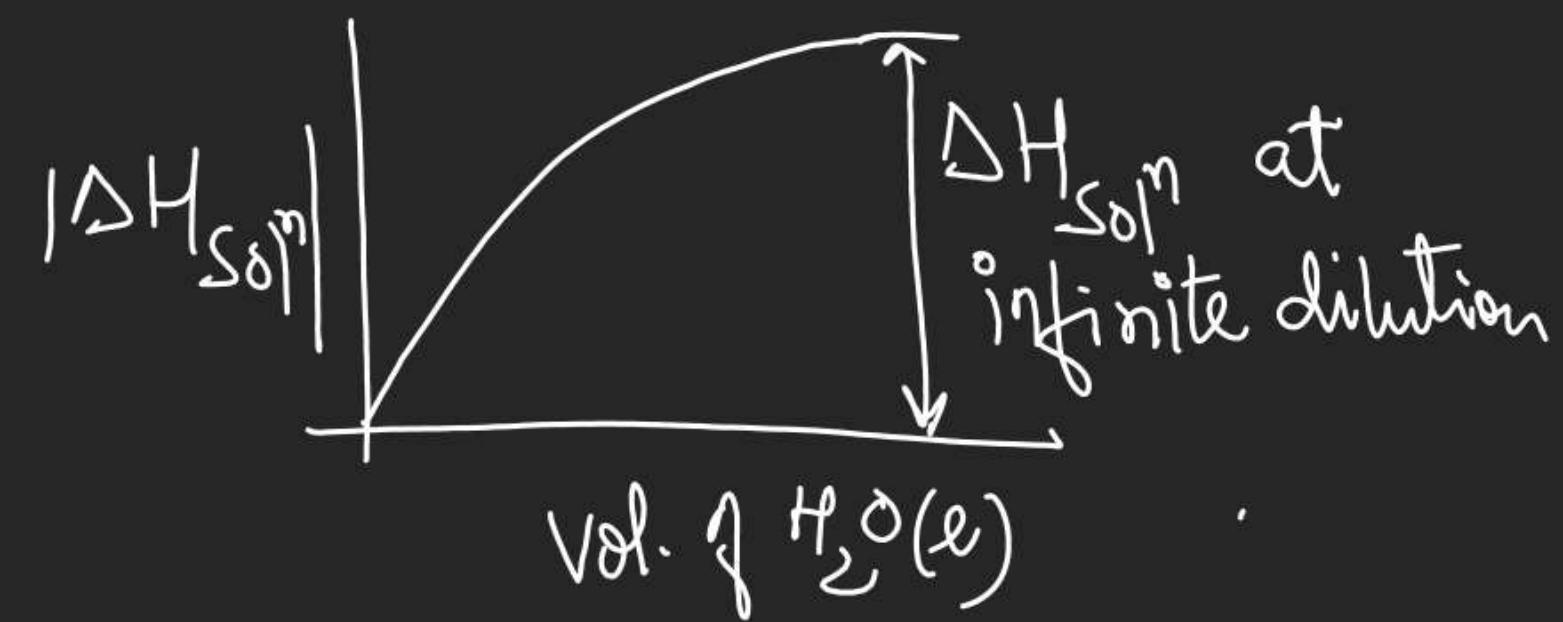
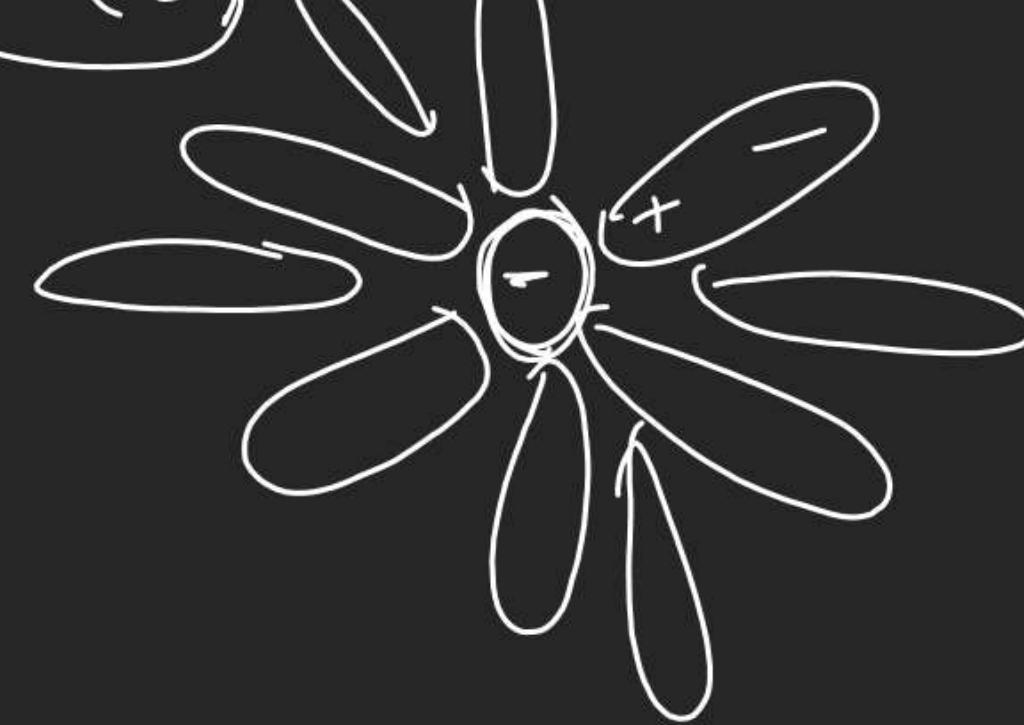
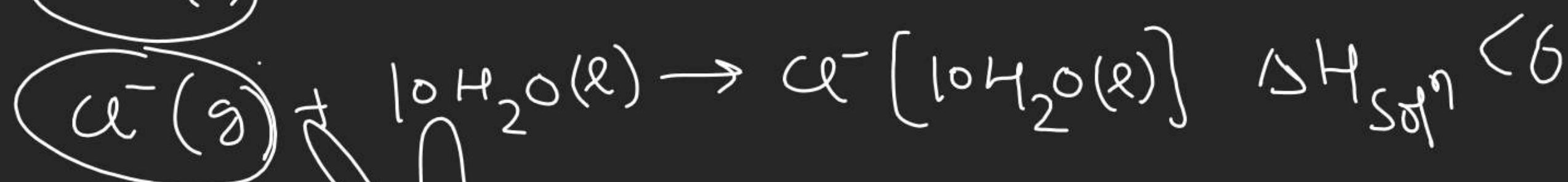


In general its negative

THERMOCHEMISTRY

Enthalpy of solution :→ It is the enthalpy change when 1 mol substance is mixed with excess solvent to form solution

④ for ions



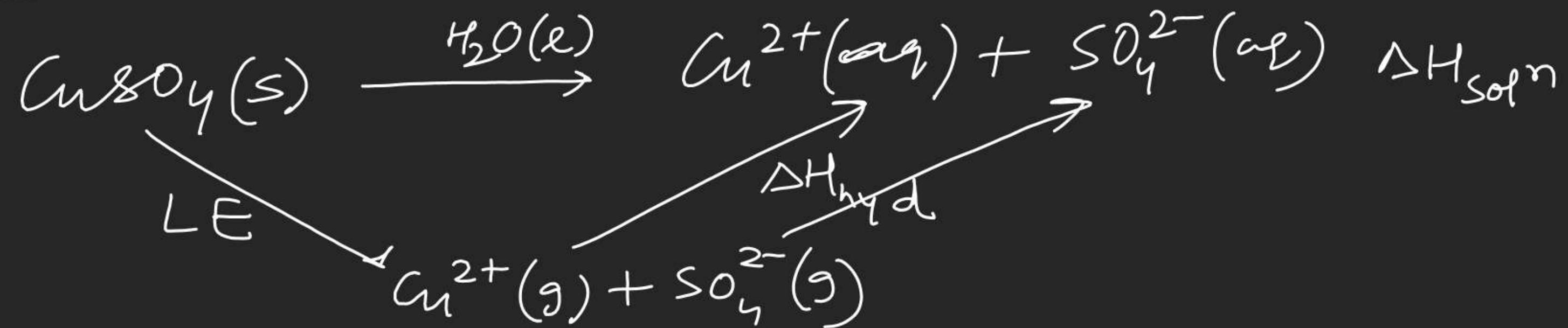
THERMOCHEMISTRY

$$\Delta H_{\text{soln}} \text{ for } 2\text{M } \text{Cl}^-(\text{g}) = -100 \text{ J/mol}$$

↑
(Enthalpy change when 1mol Cl^- is mixed
with $\frac{1}{2}$ lit $\text{H}_2\text{O}(\ell)$)

In case of ion $\underline{\underline{\Delta H_{\text{soln}} = \Delta H_{\text{hyd}} \text{ of ions}}}$

⑥ for ionic compⁿ



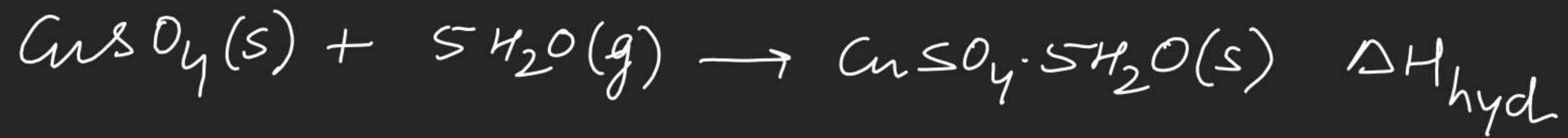
$$\Delta H_{\text{soln}} = \text{LE} + \Delta H_{\text{hydr}} \text{q ion}$$

mostly +ive

+ive

-ive

THERMOCHEMISTRY



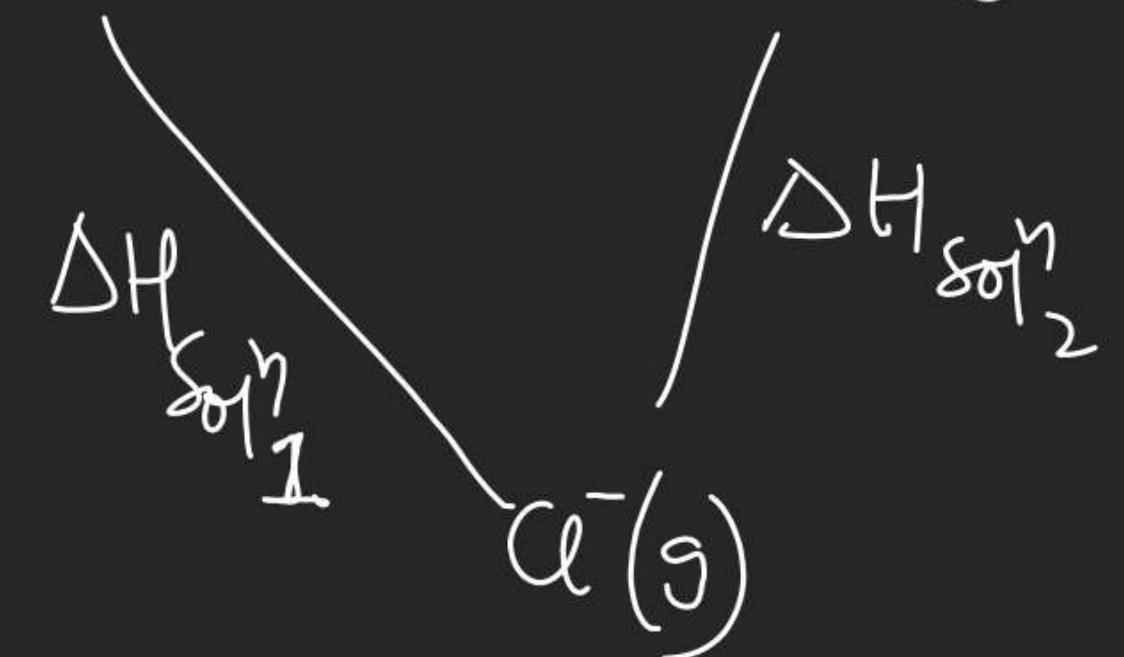
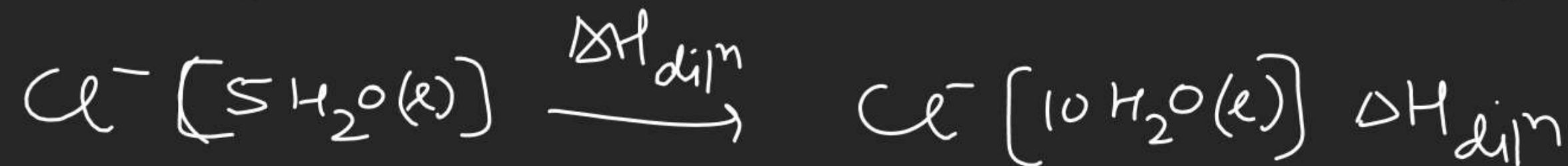
THERMOCHEMISTRY

⑥ for covalent compound



THERMOCHEMISTRY

Enthalpy of dilution: → It is the enthalpy change when a solution containing 1 mol solute is diluted.



THERMOCHEMISTRY

