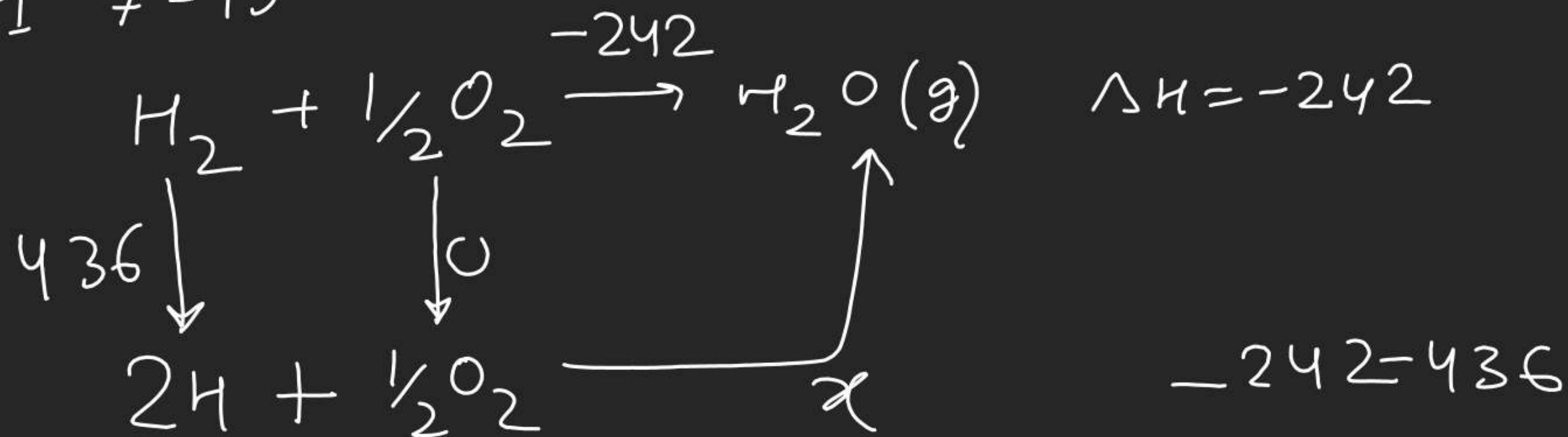


THERMOCHEMISTRY

O-I 8-20

S-I 7-15



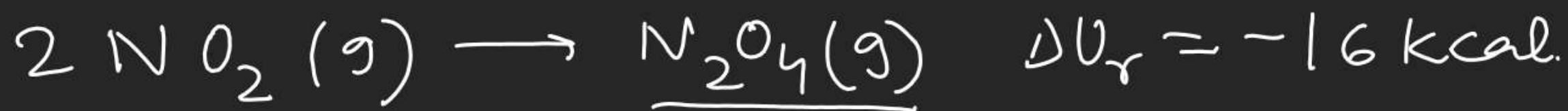
$$436 + 0 + x = -242$$

$$x = -242 - 436$$

THERMOCHEMISTRY

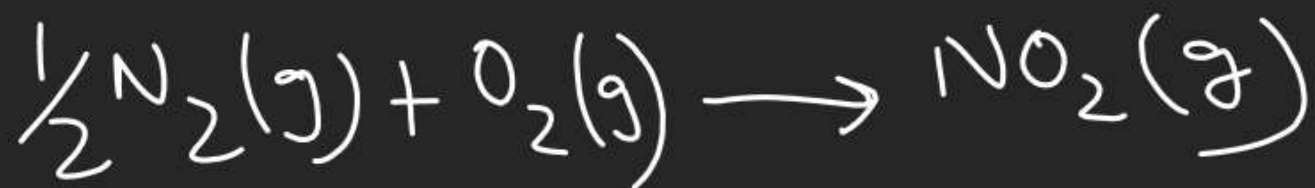


(14)



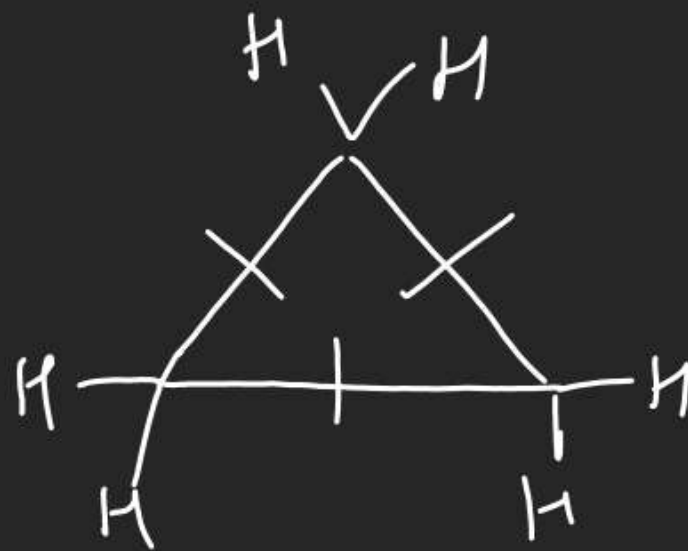
$$\Delta U_r = -16 = 2 - 2\Delta U_f(\text{NO}_2)$$

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



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

THERMOCHEMISTRY



$$= 3 E_{\text{C}-\text{C}} - E_{\text{C}-\text{C}} - E_{\text{C}=\text{C}}$$

THERMOCHEMISTRY

S-I ~~8~~ 7

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

0.16 gm
CH₄

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

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



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

THERMOCHEMISTRY

$$\textcircled{8} \rightarrow |Q| = 1200 \times 0.25$$
$$|Q| = 300 \text{ cal}$$

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

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

$$\textcircled{\eta} = \frac{300}{200 \times 1000}$$

THERMOCHEMISTRY

(15)



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

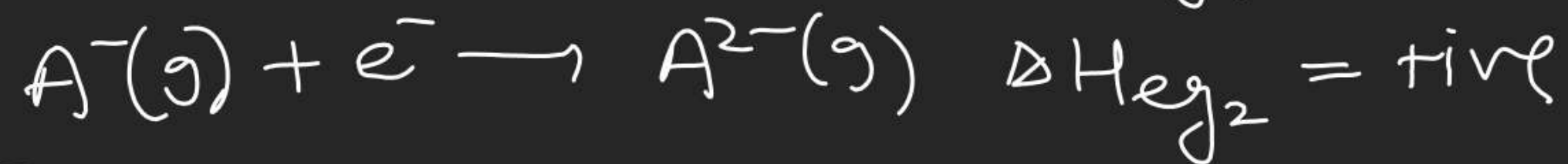
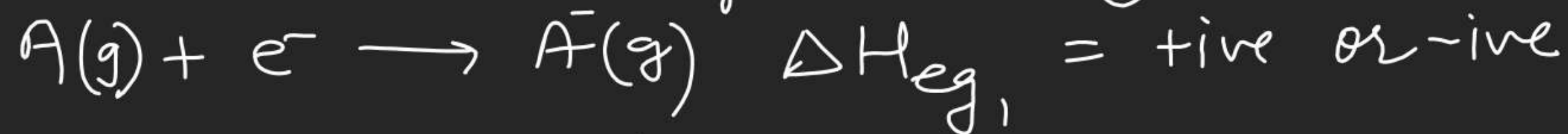
THERMOCHEMISTRY

$$(IE)_T - (IE)_0 = \frac{5}{2}R(T-0)$$

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

THERMOCHEMISTRY

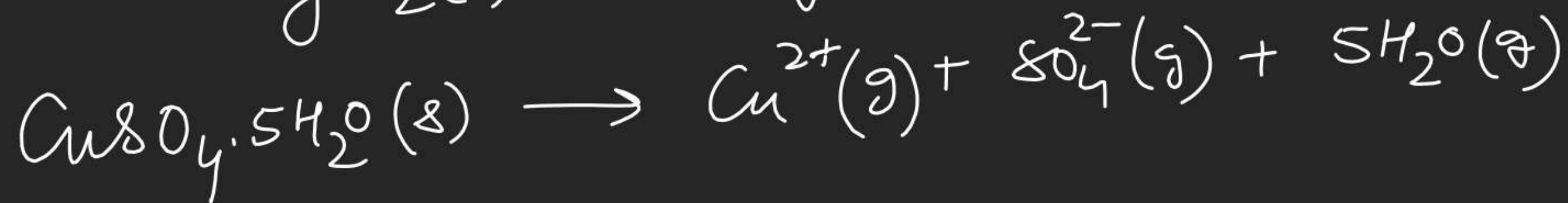
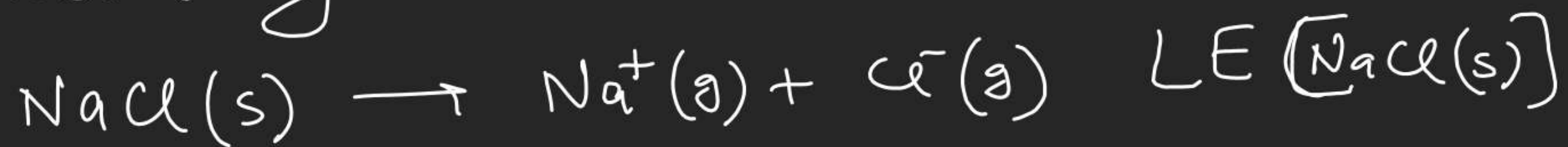
Electron gain enthalpy \rightarrow Enthalpy change when an e^- is added to each of 1 mol of isolated gaseous atoms



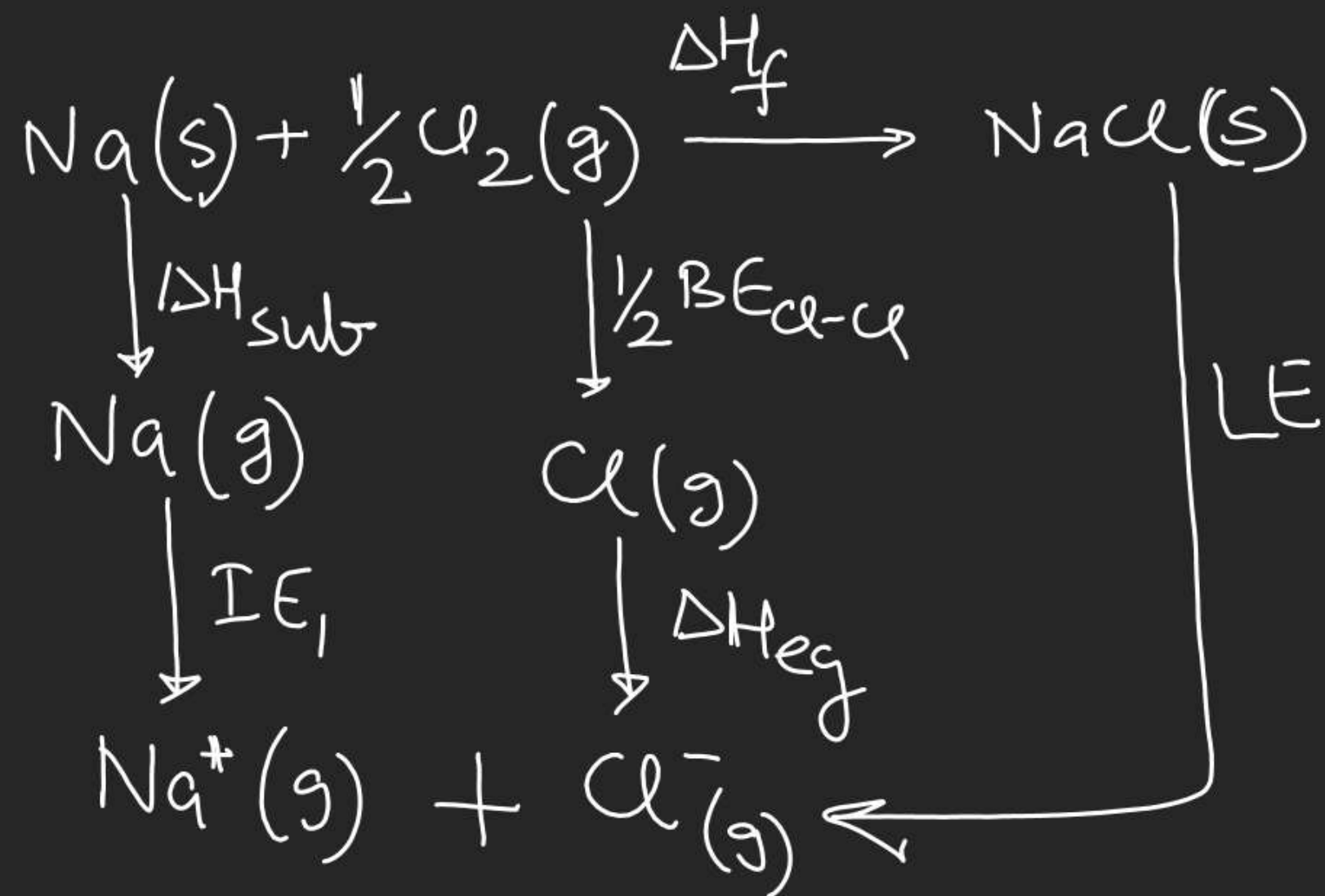
$$\text{Electron affinity (EA)} = - (\Delta H_{eg})_{OK}$$

THERMOCHEMISTRY

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



THERMOCHEMISTRY

Born Haber cycle

$$\begin{aligned}
 \Delta H_f + \text{LE} &= \Delta H_{\text{sub}} + \text{IE}_1 \\
 &+ \frac{1}{2} \text{BE}_{\text{Cl-Cl}} \\
 &+ \Delta H_{\text{eg}}
 \end{aligned}$$

THERMOCHEMISTRY

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

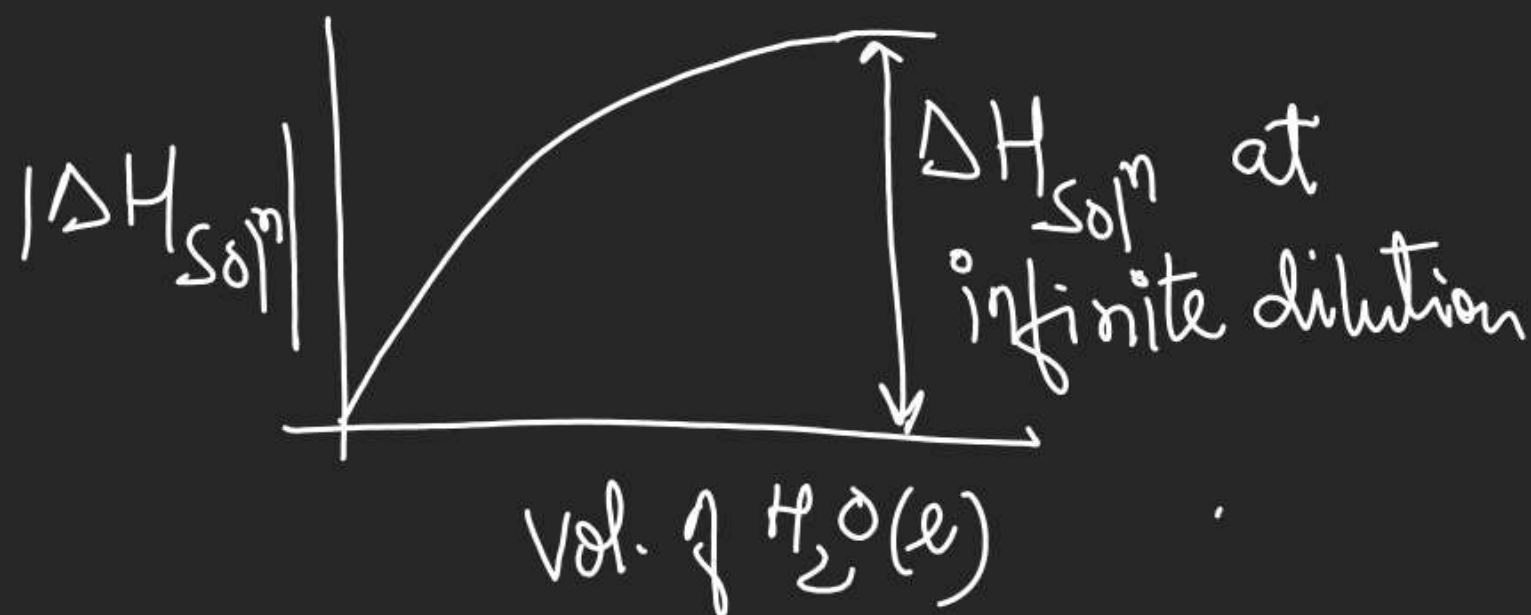
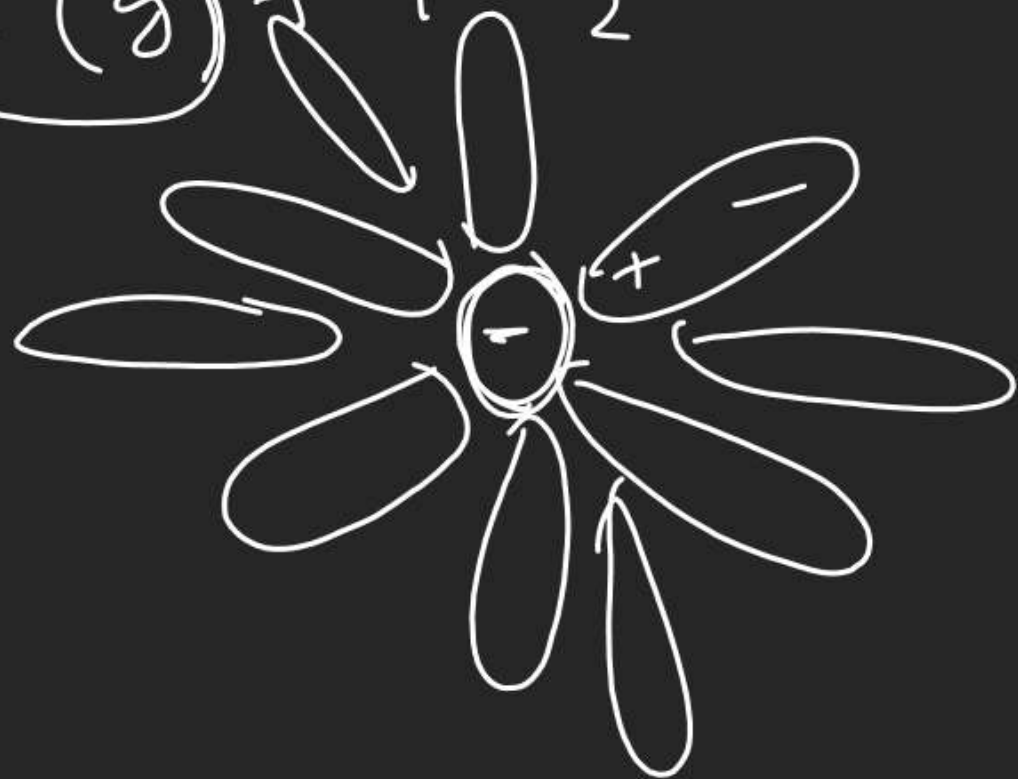
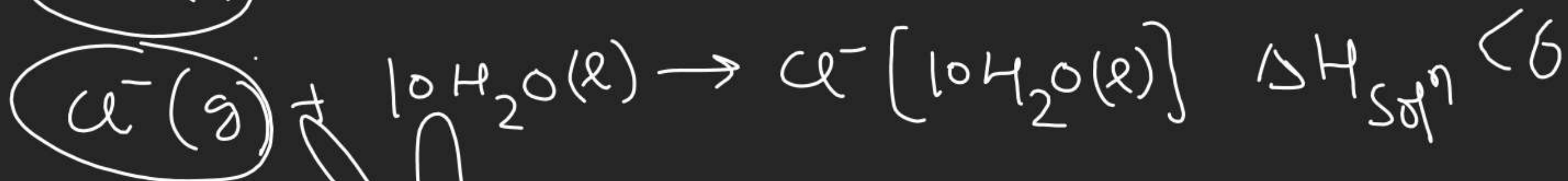
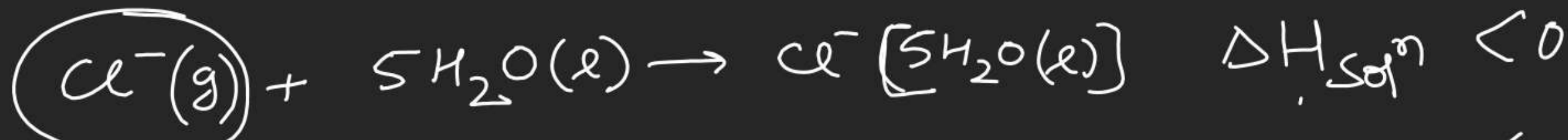
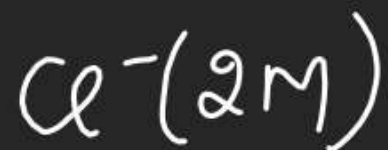


In general its negative

THERMOCHEMISTRY

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

@ for ions



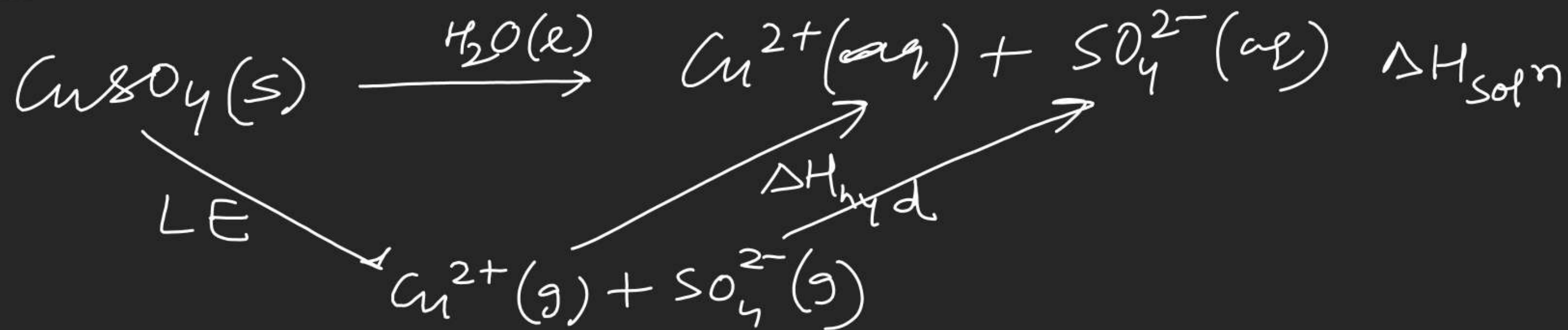
THERMOCHEMISTRY

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

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

In case of ion ΔH_{soln} = ΔH_{hyd} of ions

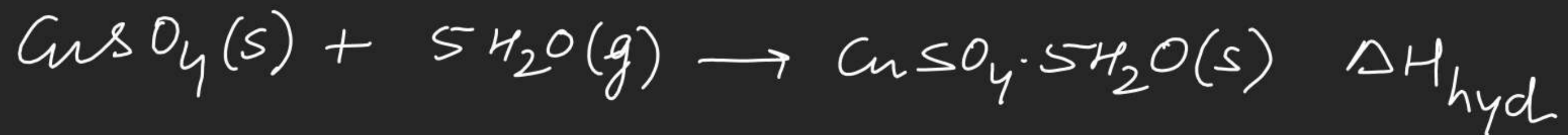
⑥ for ionic compⁿ



$$\Delta H_{\text{soln}} = \text{LE} + \Delta H_{\text{hyd}} \text{ of ion}$$

+ive
-ive

mostly +ive

THERMOCHEMISTRY

© for covalent compound



THERMOCHEMISTRY

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

