KNOCKHARDY NOTES

A LEVEL CHEMISTRY

ENTHALPY CALCULATIONS

AT A GLANCE

PROCEDURE

① See what value you have to find
② Write the correct equation for the change
③ See what data is provided
④ Select the method of calculation **which uses the data** and apply Hess's Law
⑤ Check the sign and units for ΔH

- DEFINITIONS -

Hess's Law
The enthalpy change is independent of the path taken.

Bond Enthalpy
The energy required to break ONE MOLE of gaseous bonds to form gaseous atoms.

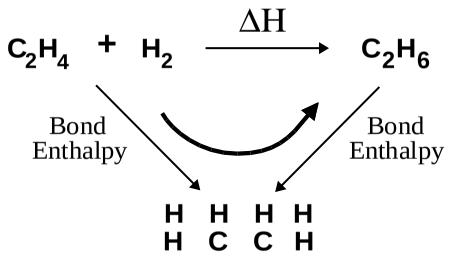
Standard Enthalpy Change of Combustion (ΔH°_c)
The enthalpy change when ONE MOLE of a substance undergoes complete combustion in its standard state.

Standard Enthalpy Change of Formation (ΔH°_f)
The enthalpy change when ONE MOLE of a compound is formed in its standard state from its elements in their standard states.

---- Elements have ZERO enthalpy of formation ----

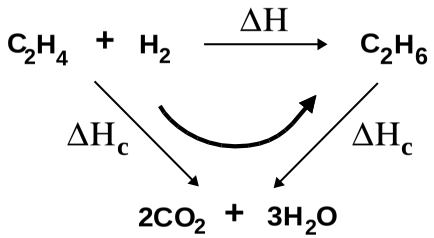
METHODS FOR CALCULATING ENTHALPIES OF REACTION USING...

Bond enthalpy



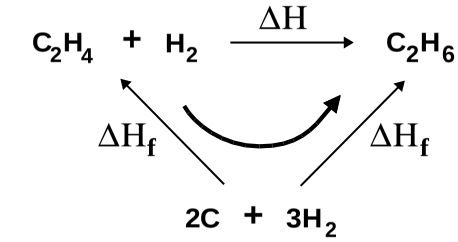
$$\Delta H_r = \sum \text{BOND ENTHALPIES OF REACTANTS} - \sum \text{BOND ENTHALPIES OF PRODUCTS}$$

Enthalpy Change of Combustion



$$\Delta H_r = \sum \Delta H_{c\,(REACT)} - \sum \Delta H_{c\,(PROD)}$$

Enthalpy Change of Formation



$$\Delta H_r = \sum \Delta H_{f\,(PROD)} - \sum \Delta H_{f\,(REACT)}$$

© J. L. HOPTON 2009