Hess's Law

Calculating an enthalpy change you cannot measure directly.

Chemistry

The enthalpy change of a reaction is the same whatever the route taken.

$$\Delta H = \Sigma \Delta Hf(\text{products}) - \Sigma \Delta Hf(\text{reactants})$$

Using formation enthalpies — **Products minus reactants**

Arrows point up from elements.

Using combustion enthalpies — **Reactants minus products**

Arrows point down to products.

Elements in standard state — **$\Delta Hf = 0$**

By definition.

THE COMMON MISTAKE

× **Using the same direction for formation and combustion cycles**

✓ **Formation: products – reactants. Combustion: reactants – products**

The arrows point opposite ways in the two cycles, which reverses the subtraction.

Draw the cycle. Getting the arrow directions right is more than half the marks in these questions.