

5.5.2 HESS'S LAW

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🎯 Learning outcomes

Candidates should be able to:

1. apply Hess's Law to construct simple energy cycles
2. carry out calculations using cycles and relevant energy terms, including:
 - (a) determining enthalpy changes that cannot be found by direct experiment
 - (b) use of bond energy data

Introduction

The law of conservation of energy states that 'energy cannot be created or destroyed'. This is also called the **first law of thermodynamics**.

The first law of thermodynamics also applies to chemical reactions: the total energy of the chemicals and their surroundings must remain constant. In 1840, Germain Hess applied the law of conservation of energy to enthalpy changes.

Hess's law: 'The enthalpy change accompanying a chemical change is independent of the route by which the chemical change occurs.'

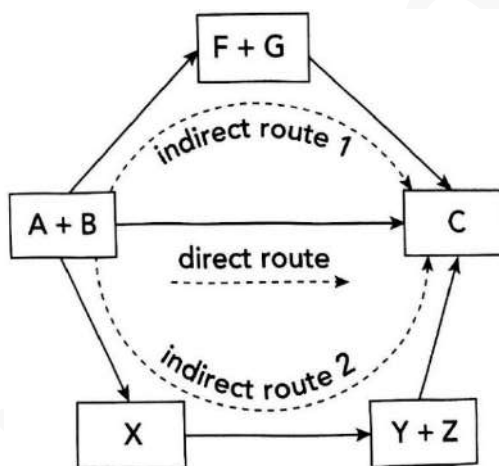


Fig: An enthalpy cycle (Energy cycle) or Hess cycle

Calculating enthalpy change of reaction from enthalpy change of formations

Enthalpy change of reaction from enthalpy change of combustions

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