

What is Lattice Energy?

Lattice energy is a measure of the strength of the ionic bonds in an ionic compound. It provides insight into several properties of ionic solids including their volatility, their solubility, and their hardness. The lattice energy of an ionic solid cannot be measured directly. However, it can be estimated with the help of the Born-Haber cycle. Generally, this quantity is expressed in terms of kilojoules per mole (kJ/mol).

Definition

Lattice energy can be defined as the energy required to convert one mole of an ionic solid into gaseous ionic constituents.

Example

The crystal lattice of a sodium chloride molecule is illustrated below.

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In the case of this ionic molecule, the lattice energy is the energy required for the following reaction to proceed.



Here, the energy that must be supplied to 1 mole of **sodium chloride** to separate it into gaseous Na⁺ and Cl⁻ ions is 786 kilojoules.