

❖ Factors on which lattice energy depends

In the gas phase, it is defined as the heat of formation for opposite charge ions to be combined into an ionic solid. As an example, sodium chloride's lattice energy, NaCl , is the energy released when gaseous Na^+ and Cl^- ions join together to form a lattice of alternating ions in the NaCl crystal.

The two main factors contributing to an ionic solid lattice energy: is the charge on the ions and the ion radius, or size.

- As charge on ions increases, the energy of the lattices increases.
- As the ion size increases, the energy from the lattices decreases.
- As it is clear that the lattice energy depends upon the charge of the ions

Sodium chloride and magnesium oxide have exactly the same arrangements of ions in the crystal lattice, but the lattice enthalpies are very different.

the lattice enthalpy of magnesium oxide is much greater than that of sodium chloride. That's because in magnesium oxide, $2+$ ions are attracting $2-$ ions; in sodium chloride, the attraction is only between $1+$ and $1-$ ions.

The lattice enthalpy of magnesium oxide is also increased relative to sodium chloride because magnesium ions are smaller than sodium ions, and oxide ions are smaller than chloride ions.

That means that the ions are closer together in the lattice, and that increases the strength of the attractions.