The electrostatic charge on ions causes them to be surrounded by ions of the opposite charge in a lattice structure. The formula unit of sodium chloride is NaCl, as this is the simplest ratio describing the ions present. The coordination number is six, as each Cl\(^-\) and Na\(^+\) is surrounded by 6 of the oppositely charged ions. The strength of the lattice structure can be described by the lattice energy. In general, ionic compounds have high melting points. Why? The ions are now said to be hydrated. When can ionic compounds conduct electricity? It requires a lot of energy to overcome all of the electrostatic forces of attraction.

**Ionic compounds form when oppositely charged ions attract**

**Ionic compounds have a lattice structure**

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**The physical properties of ionic compounds reflect their lattice structure**

In general, ionic compounds have high melting points and are solids.

**Solvability**

It is possible to dissolve some ionic compounds in water, but it is not possible to dissolve acids, bases, or salts. The best solvents for ionic compounds are polar solvents, such as water. The solubility of ionic compounds is dependent on the size of the ions and the lattice energy. Larger ions have lower solubility, and compounds with higher lattice energies are less soluble.

**Electrical conductivity**

When can ionic compounds conduct electricity? When dissolved in water or in a molten (liquid) state. The ions can move freely.

**Brittleness**

Ionic compounds are usually brittle, which means the crystal tends to shatter when force is applied. This is because the ions within the lattice place ions of the same charge alongside each other, so the attractive forces cause it to split.

**Different ionic compounds have a different extent of ionic character**

- The lattice energy difference is 6, which makes it possible to conduct electricity.
- Pure ionic solvents are NaCl and Cl\(^-\).
- Pure covalent is H\(^+\)N\(^-\).