Properties of Compounds

Today's Plan

- States of Matter
- Properties of Ionic Compounds
- Properties of Molecular Compounds
- Lab procedure

Today's Plan

- Program of studies outcomes:

- classify ionic and molecular compounds, acids and bases on the basis of their properties; i.e., conductivity, pH, solubility, state
- predict whether an ionic compound is relatively soluble in water, using a solubility chart
- relate the molecular structure of simple substances to their properties

States of Matter

- We will be using 4 states of matter in science 10

- Solid (s)
- Liquid (l)
- Gas (g)
- Aqueous (aq)

- The state is written as a subscript next to a chemical formula

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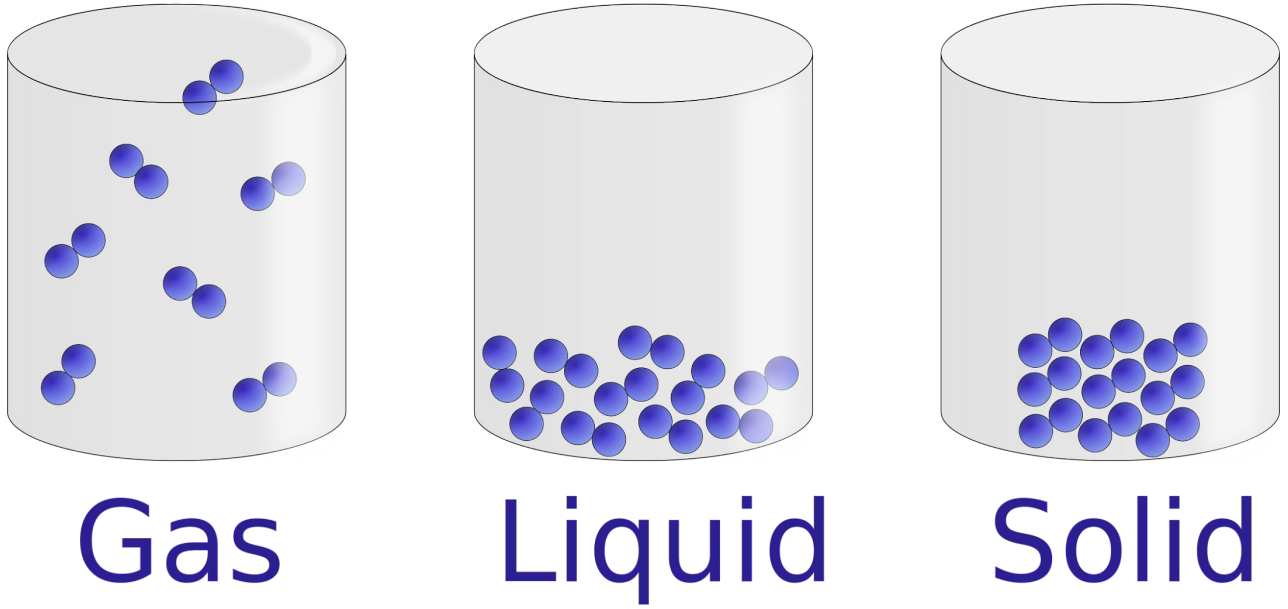

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States of Matter

- When writing a chemical formula, use the state of the compound at room temperature
- If the state is not obvious, it will be given to you

NaCl

H_2O

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Solution of copper(II) chloride

O_2

Ionic Compounds

- Ionic compounds form when **electrons transfer** from one atom to another forming stable ions with full outer energy levels.

- The oppositely charged ions have an electrostatic attraction which forms an **ionic bond**.
- The oppositely charged ions group together in an organized array called a **crystal lattice**.

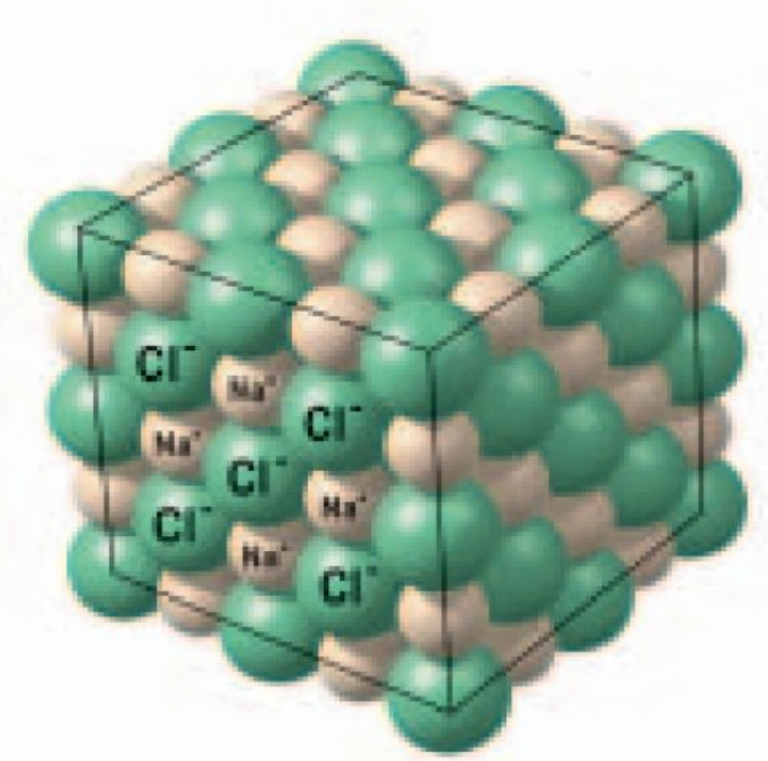
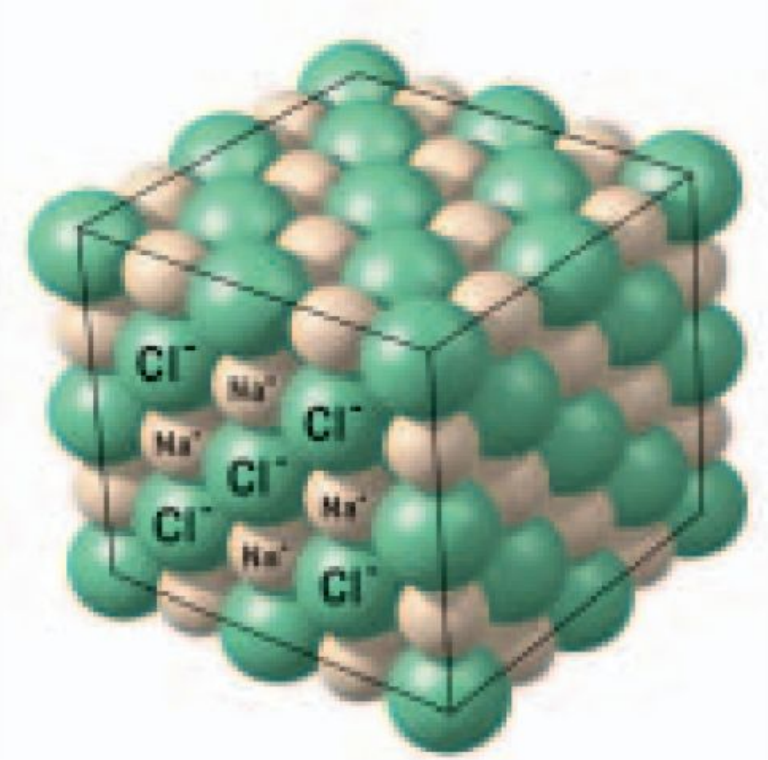


FIGURE A2.15 Table salt (NaCl) is an ionic compound. As a solid, it forms a crystal lattice.

Ionic Compounds

- The crystal structure of ionic compounds can make them very stable
- Ionic compounds usually have very high melting points, and are solid at room temperature
- Ionic compounds are often soluble in water, but we will see how to tell which ones are



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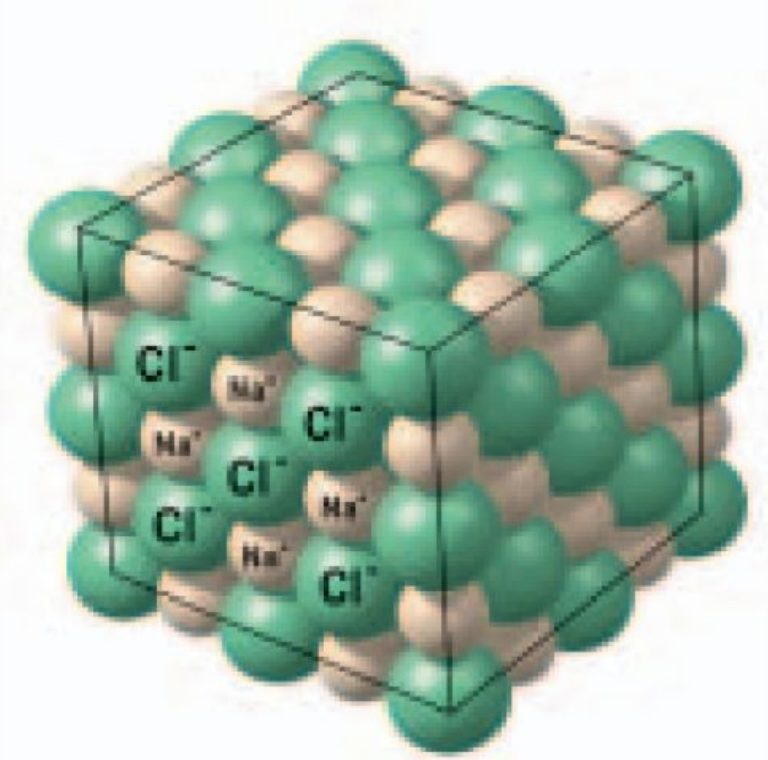
Ionic Solutions

- When ionic compounds dissolve, their ions separate and spread out in the liquid. We call this **dissociation**

- This dissociation allows ionic solutions to conduct electricity



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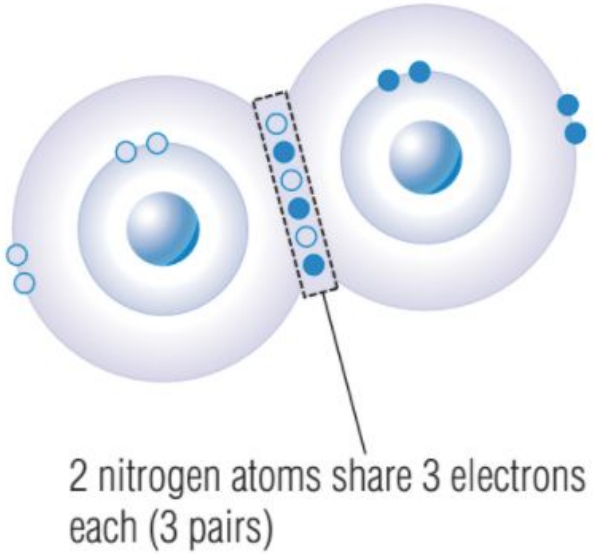
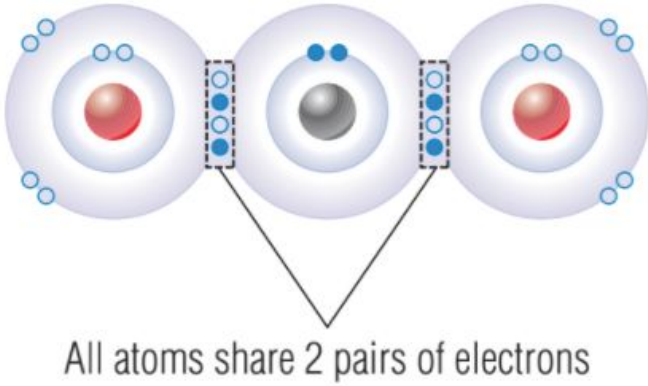
Molecular Compounds

- While ionic compounds **transfer** electrons, molecular compounds **share** electrons between their atoms

- Molecular compounds can vary in their properties, but there are some general trends

- Molecular compounds usually have lower melting points than ionic compounds. Some are solids, liquids, or gases at room temperature.

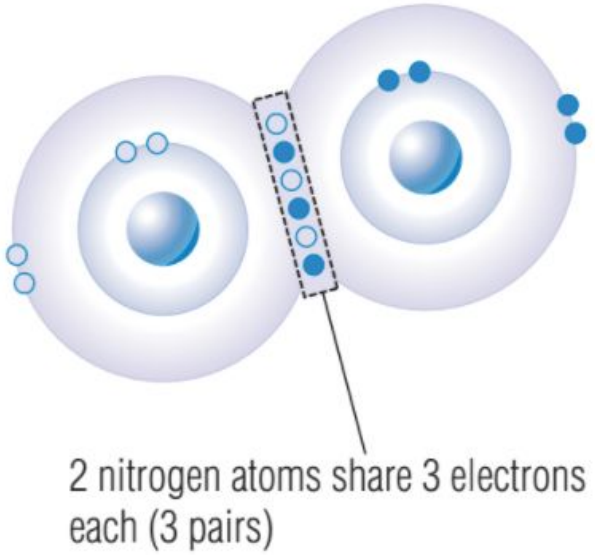


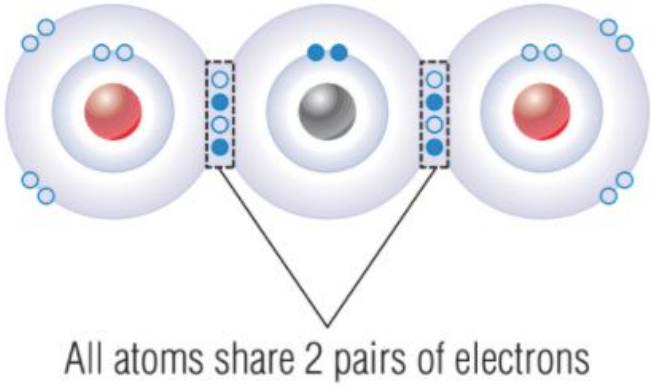


Molecular Compounds

- Not all molecular compounds will dissolve in water.
- Some do, sucrose for example
- Others like oils do not

- Can molecular compounds conduct electricity?





Compounds

Ionic Compounds

- High melting points (solids at SATP)
- Distinct crystal structure
- Dissolve in water
- Good conductors in solution

Molecular Compounds

- Lower melting points (solids, liquids or gases at SATP)
- Sometimes dissolve in water
- Do not conduct electricity

Lab:

- We will be determining whether a given compound is ionic or molecular

- Based on the properties we discussed today, how can we determine the nature of a compound?