**9.1 An Overview of Bonding**

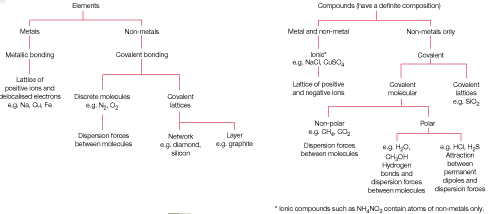
All chemical bonding is electrostatic in nature. The strength of chemical bonding depends on the balance between the attraction between unlike charges and the repulsion between the charges:

* Metallic bonding results from the electrostatic attraction between cations and delocalised electrons
* Ionic bonding results from the electrostatic attraction between cations and anons
* Covalent bonding results from the electrostatic attraction between shared electrons and the nuclei of the atoms involved in the bond

**Predicting the type of Bonding in a substance**

To determine the type of bonding that occurs within a substance, we need to consider the following:

* What type of elements are involved?
* Are the outer-shell electrons:
  + Free to move (delocialised as found in metallic lattices)?
  + Donated from one atom to another atom (or group of atoms), creating ions (as found in ionic lattice)?
  + Shared between atoms (as found in covalent bonding)?
* Are the particles present ions, atoms or molecules?



**Worked Example 9.1a**

**Identify the bonding in each of the following substances in their solid state:**

1. **Copper**

Type of elements:

Type of particles:

Type of lattice:

1. **Copper sulfate**

Type of elements:

Type of particles:

Type of lattice:

1. **Carbon dioxide**

Type of elements:

Type of particles:

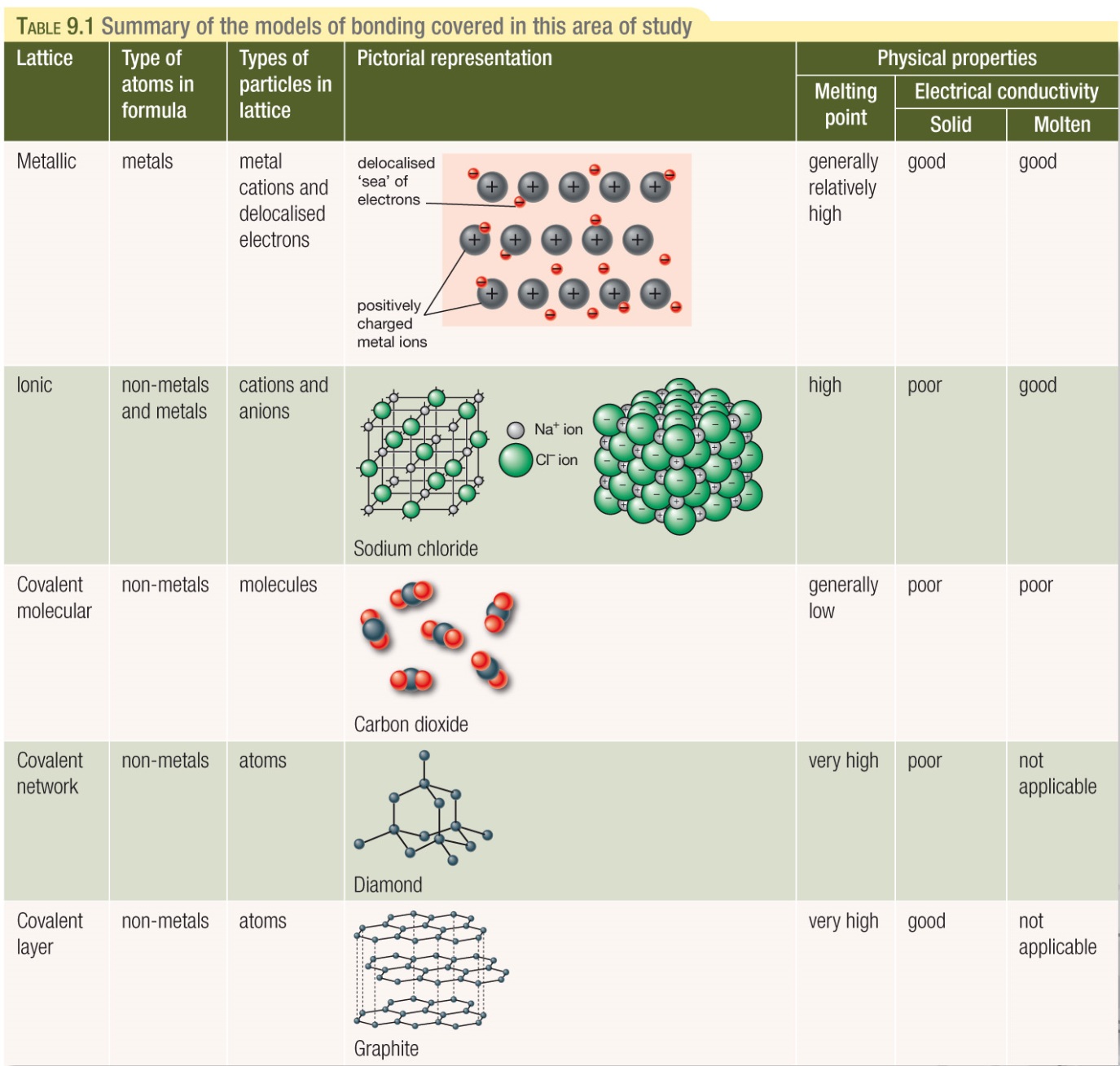
Type of lattice:

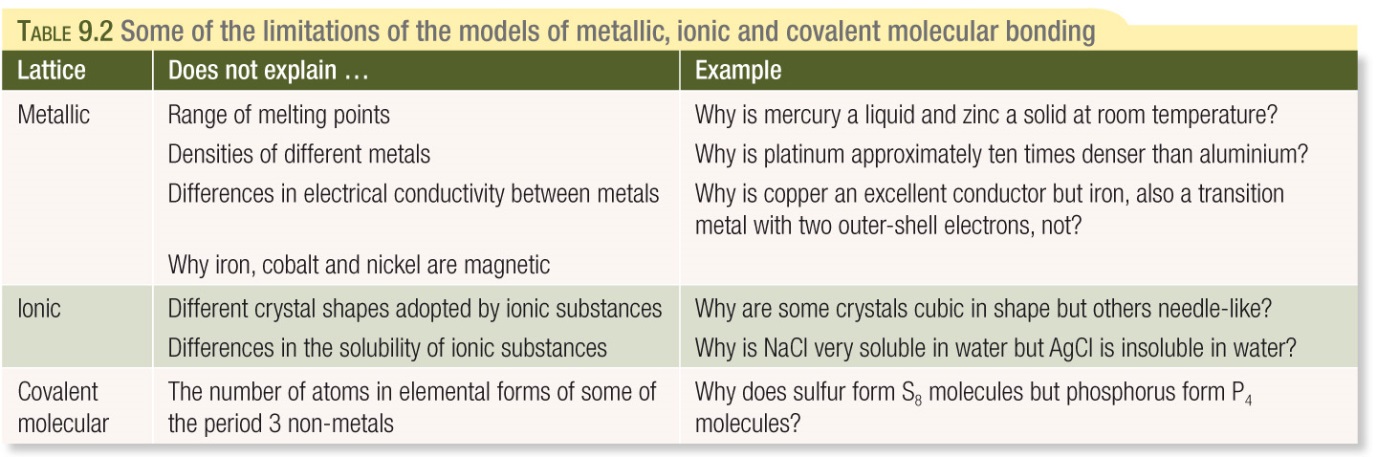
1. **Hydrogen bromide**

Type of elements:

Type of particles:

Type of lattice:

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**Text Questions: 1 & 2**