

Solutions

Each answer shows the steps, then the **result**.

2.1

- Ionic

2.2

- Nonpolar covalent — two identical atoms, so $\Delta\text{EN} = 0$ and the electrons are shared equally

2.3

- Ionic

3.1 C

- MgO is a metal + nonmetal, so it is ionic; the others are nonmetal–nonmetal (covalent)

3.2

(a)

- HF: $|4.0 - 2.1| = 1.9$; F₂: 0

(b)

- HF polar covalent (or borderline ionic); F₂ nonpolar covalent

3.3

- In metallic bonding the electrons are **delocalized** and shared across all the metal atoms (a "sea"); in ionic bonding electrons are **transferred** to form fixed + and – ions held by electrostatic attraction