

Chemistry: Bonding and Properties

From bonding to properties:

| Type of primary bonding | Primary bonding is between | Structure | Type of secondary (intermolecular) forces | Melting and boiling points | Typical state at room temperature | Other typical physical properties |
|-------------------------|----------------------------|-------------------------------|---|----------------------------|-----------------------------------|-----------------------------------|
| Ionic | | | | | | |
| Covalent | | Covalent network (continuous) | | | | Hard, brittle |
| | | | Dispersion forces | | | Does not conduct electricity |
| | | | Dipole-dipole attraction | | | |
| | | | Hydrogen bonding | | | |
| Metallic | | | | High | Solid | |

From properties to bonding:

| If substance has property: | Then substance is: |
|---|--------------------|
| High melting/boiling point (solid at room temperature) | |
| Moderate or low melting/boiling point (liquid or gas at room temperature) | |
| Hard or brittle | |
| Malleable | |
| Conducts electricity when molten or dissolved but not otherwise | |
| Always conducts electricity | |
| Never conducts electricity | |
| Lustrous | |