

④ COVALENT NETWORK SOLIDS

- held together by COVALENT BONDS.
- are, in essence, giant molecules where the entire solid (not simply individual molecules WITHIN the solid) are held together by covalent bonds.

... these are the strongest kind of forces holding solids together.

Example: diamond

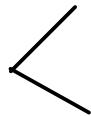
Generally, covalent network solids:

- have EXTREMELY HIGH MELTING POINTS. Many thermally decompose before melting.
- are EXTREMELY HARD. The hardest materials known are covalent network solids.
- are NONCONDUCTORS

Relative strengths of the forces holding solids together:

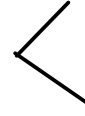
INTERMOLECULAR
FORCES

molecular solids



IONIC
BONDS

ionic solids



COVALENT
BONDS

covalent network solids



... the stronger the forces, the:

- HARDER a material
- HIGHER the melting point of the material

Metallic bonds vary considerably, so they have been left out of the comparison!