Network Covalent Compounds

Example One

The "lead" used pencils is not actually made of elemental lead. Instead, it is composed of graphite and small amounts of clay. Despite its extensive network of strong covalent bonds, thin sheets of graphite are easily deposited on paper when graphite is used for writing. What property of graphite is responsible for this?

a. The bonds between graphite and paper are stronger than the covalent bonds within graphite.
b. The tetrahedral arrangement of carbon in graphite is not stable so graphite fractures easily.
c. The weak intermolecular forces that hold flat sheets of graphite together are easily broken.

Example Two

Which one of the following classifications is incorrect?

a. CO_2 (g), molecular compound
b. SiO_2 (s), molecular compound
c. NaCl (s), ionic crystal
d. SiC (s), network covalent material
e. CaO (s), ionic crystal

Example Three

Which one of the following substances can be melted without breaking chemical bonds?

a. calcium carbonate
b. barium chloride
c. diamond
d. silicon dioxide
e. sulfur dioxide

Example Four

Which of the following does not have a structure containing a giant network of covalent bonds?

a. Diamond
b. Graphite
c. Iodine
d. Silicon carbide

Example Five

Which statement is false?

a. Molecular compounds generally have lower melting points than network covalent solids.
b. Most molecular solids melt at lower temperatures than metallic solids.
c. The attractions between the molecules in molecular compounds are stronger than those between the particles in network covalent compounds or ionic crystal lattices.

Example Six

Given the data below, which selection correctly identifies the most likely bonding present.

Substance	Conductivity as a Solid	Conductivity as a Liquid	Solubility in Water	Melting Point (°C)
A	None	None	Low	-7.2
B	None	None	None	1,710
C	None	High	High	770
D	High	None	None	550

a. Ionic Compound (A), Molecular Compound (B), Network Covalent Compound (C)
b. Ionic Compound (C), Molecular Compound (A), Network Covalent Compound (B)
c. Ionic Compound (C), Molecular Compound (B), Network Covalent Compound (D)
d. Ionic Compound (B), Molecular Compound (D), Network Covalent Compound (C)