Table 13-10 ***Characteristics of Types of Solids***

	Metallic	**Ionic**	**Molecular**	**Covalent**
Particles of unit cell	Metal "ions" in "electron gas."	Anions, cations	Molecules (or atoms)	Atoms
Strongest interparticle forces	Metallic bonds (attractions between cations and e^- 's)	Electrostatic	London, dipole-dipole, and/or hydrogen bonds	Covalent bonds
Properties	Soft to very hard; good thermal and electrical conductors; wide range of melting points. (−39 to 3400°C)	Hard; brittle; poor thermal and electrical conductors; high melting points (400 to 3000°C)	Soft; poor thermal and electrical conductors; low melting points (−272 to 400°C)	Very hard; poor thermal and electrical conductors;* high melting points (1200 to 4000°C)
Examples	Li, K, Ca, Cu, Cr, Ni (metals)	NaCl, $CaBr_2$, K_2SO_4 (typical salts)	CH_4 (methane), P_4, O_2, Ar, CO_2, H_2O, S_8	C (diamond, graphite), SiO_2 (quartz) mostly group 4A (C, Si, Ge, Gray Sn, SiC) and a few others (BN, GeO_2)

**Exceptions: diamond is a good conductor of heat; graphite is soft and conducts electricity well.*