CONCEPT: ATOMIC, IONIC AND MOLECULAR SOLIDS

- The most fundamental distinction between solids is that they are classified as either *crystalline* and *amorphous* solids.
  - □ **Crystalline solid:** atoms, ions, and molecules that have a highly _____ arrangement throughout.
  - □ **Amorphous solid:** particles that are _____ arranged throughout with no discernible pattern.

Crystalline vs Amorphorus Solids

Solid Type	Smallest Unit	Electrostatic Forces	Properties	Examples
Ionic Solid	Ionic	Attraction between ____ & ____ ions	□ _____ & hard □ _____ MP	_____
Molecular Solid	Molecules	_____ Forces	□ _____ texture □ _____ MP	_____
Covalent Network	Atoms	_____ Bonds	□ _____ texture □ _____ MP	_____
Metal	Metal Atoms	_____ Bonds (Pooling of Electrons)	□ _____ (shiny) □ _____ (Na) to _____ (Ti) □ _____ MP	_____
Amorphous Solid	Atoms, ions, molecules or _____ (plastics)	Any of the above	□ _____ distinct MP □ Able to _____	_____

EXAMPLE: Identify the ionic solid from the following options.

a) Cl_2 b) H_2Te c) AlF_3 d) C (graphite)

PRACTICE: What is the major electrostatic force found between ammonia molecules, NH_3?

a) a bond b) Ionic bond c) Covalent bond d) Intermolecular Forces e) Anionic bond

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PRACTICE: As it cools off, olive oil slowly hardens and forms a solid over a range of temperatures. Which best describes it as a solid?

a) Ionic b) Covalent Network c) Metallic d) Amorphous e) Molecular Crystals

PRACTICE: Compound A is hard, doesn't conduct electricity, and melts at 1400ºC. Compound A represents which of the following:

a) Ionic solid b) Metallic solid c) Molecular solid d) Covalent Network solid

PRACTICE: Classify each solid as amorphous, molecular, network covalent, alloy or ionic.

a) Steel _____

b) CO_2 _____

c) Graphite _____

d) $CaCO_3$ _____

e) Bronze, an alloy of Cu and Sn _____