

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 Amorphous Solids				
Solid Type	Smallest Unit	Electrostatic Forces	Properties	Examples
Ionic Solid	Ionic	Attraction between _____ & _____ ions	<input type="checkbox"/> _____ & hard <input type="checkbox"/> _____ MP	_____
Molecular Solid	Molecules	_____ Forces	<input type="checkbox"/> _____ texture <input type="checkbox"/> _____ MP	_____
Covalent Network	Atoms	_____ Bonds	<input type="checkbox"/> _____ texture <input type="checkbox"/> _____ MP	_____
Metal or Alloy	Metal Atoms	_____ Bonds (Pooling of Electrons)	<input type="checkbox"/> _____ (shiny) <input type="checkbox"/> _____ (Na) to _____ (Ti) <input type="checkbox"/> _____ MP	_____
Amorphous Solid	Atoms, ions, molecules or _____ (plastics)	Any of the above	<input type="checkbox"/> _____ MP <input type="checkbox"/> 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 within an ammonia molecule, NH_3 ?

a) Metallic 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 1400°C. 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) CO₂ _____
- c) Graphite _____
- d) CaCO₃ _____
- e) Bronze, an alloy of Cu and Sn _____