

## Classification of Matter According to Bonding

ionic bonding: requires a metal and a non-metal

metallic bonding: requires metals only

covalent bonding: requires non-metals only

- could be a network solid (diamond  $C_n$  or quartz  $(SiO_2)_n$ )
- could be a discrete covalent molecule, which could be polar or non-polar

other useful points:

- find ionic and metallic compounds first
- put  $C_n$  and  $SiO_2$  in the network solid column (remember)
- deal with remainder (hard ones - discrete covalent)
  - if C and H only → non-polar ( $\Delta EN$  is too small to be polar)
  - if C H and O → polar (strong O polarizations)
  - draw diagram for the rest or remember

<b>IONIC</b> (macromolecules)	<b>COVALENT</b>			<b>METALLIC</b> (macromolecules)
	<b>NETWORK SOLID</b> (macromolecules)	<b>DISCRETE COVALENT MOLECULES</b>		
		<b>POLAR</b>	<b>NON-POLAR</b>	

K <sub>2</sub> S	Au	Na <sub>2</sub> O	CuZn (brass)	LiCl
C <sub>n</sub> (diamond)	SiO <sub>2</sub> (quartz)	CH <sub>4</sub>	NH <sub>3</sub>	H <sub>2</sub> O
CO <sub>2</sub>	C <sub>4</sub> H <sub>10</sub>	C <sub>2</sub> H <sub>5</sub> OH	Fe	HCl
NaCl	C <sub>3</sub> H <sub>6</sub> O	C <sub>6</sub> H <sub>12</sub> O <sub>6</sub>	Al <sub>2</sub> O <sub>3</sub>	PH <sub>3</sub>

- see next page for answers

<b>IONIC</b> (macromolecules)	<b>COVALENT</b>		<b>METALLIC</b> (macromolecules)	
	<b>NETWORK SOLID</b> (macromolecules)	<b>DISCRETE COVALENT MOLECULES</b>		
		<b>POLAR</b>		<b>NON-POLAR</b>
K <sub>2</sub> S Na <sub>2</sub> O LiCl NaCl Al <sub>2</sub> O <sub>3</sub>	C <sub>n</sub> SiO <sub>2</sub>	C <sub>2</sub> H <sub>5</sub> OH C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> C <sub>3</sub> H <sub>6</sub> O NH <sub>3</sub> H <sub>2</sub> O HCl	CH <sub>4</sub> C <sub>4</sub> H <sub>10</sub> CO <sub>2</sub> PH <sub>3</sub>	Au CuZn Fe