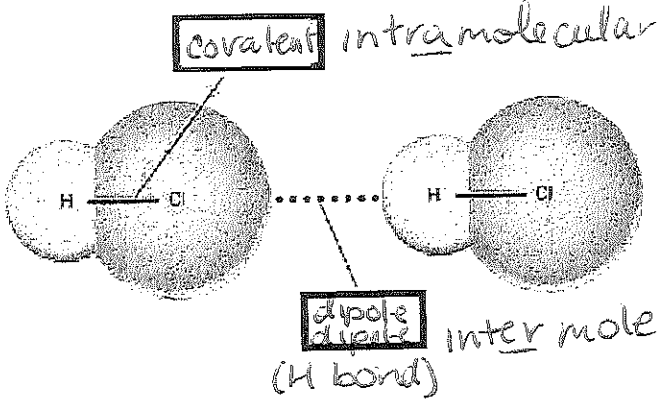
(#4-2a)

Why is a liquid a liquid?

---

1. When you melt an ionic substance what type of bond do you break? ionic
2. When you melt a network covalent bond what type of bond do you break? covalent
3. When you melt a molecular solid what type of bond do you break? intermolecular bonds (IMF)



intramolecular bond

intermolecular bonds (forces)
IMF

4. Label the type of force above (intermolecular/intramolecular)

5. What is the difference between an intermolecular force and an intramolecular force?

between molecules — within the molecule

6. Student hypothesis: A substance is a solid at room temperature because molecules stick together. They reason they stick together is they really like each other. Justify or nullify?

Nullify: Molecules stick together due to intermolecular forces

7. What is the only reason two molecules would stick together?

Temperature and Pressure

8. What is needed for a hydrogen bond to occur?

H bonds occur between 2 polar covalent molecules

9. What is needed for London dispersion force to occur?

LDF occur between nonpolar covalent molecules

10. Indicate the type of force that is causing the substance to be a solid/liquid or gas? Order them from highest to lowest melting point.

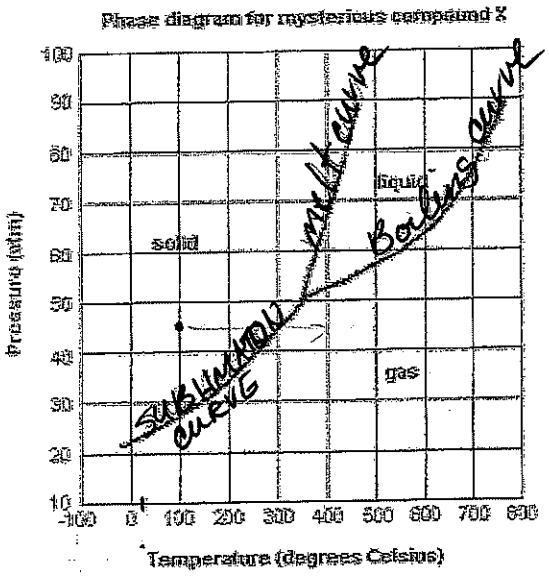
2	lowest 6	Highest	4	3	5
$MgCl_2$	H_2	$C_{(diamond)}$	H_2O	NaCl	C_5H_{12}
ionic	LDF (nonpolar covalent)	covalent (network)	H bonds (polar molecule)	ionic	LDF (nonpolar covalent)

Phase Diagram Worksheet

Name_____

Hour___

For each of the questions on this worksheet, refer to the phase diagram for mysterious compound X.



Label the melting curve, boiling curve and sublimation curve.

1) If you were to have a bottle containing compound x, what phase would it most likely be in? (room temp is 21 degrees C, pressure = 1 atm) gas

2) At what temperature and pressure will all three phases coexist (triple point)? 350°C & 50 atm

3) If I have a bottle of compound X at a pressure of 45 atm and temperature of 100 degrees C what will happen if I raise the temperature to 400 degrees C? sublimation (solid → gas) @ 300°C

4) Why can't compound X be BOILED at temperature of 200 degrees C? no liquid phase @ 200°C

5) What state of matter is compound x at 400 degrees and 30 atm? gas

6) What state of matter is compound x at 400 degrees and 60 atm? liquid

7) Can compound x ever be a solid at 800 degrees according to the diagram? no, it is past the critical point