HONORS CHEMISTRY UNIT 17 NOTEPACKET-SOLIDS AND LIQUIDS

INTERMOLECULAR FORCES

Intramolecular forces

Intermolecular forces

Types of intermolecular forces

1. Dipole-dipole attraction
2. Hydrogen bonding
3. London Dispersion Forces

WATER AND ITS PHASE CHANGES

Drawing a heating curve for water.



Normal Boiling Point

Normal Freezing Point

ENERGY REQUIREMENTS FOR THE CHANGES OF STATE

Molar heat of fusion

Molar heat of vaporization

Sample problem 1: Calculate the energy required to melt 8.5 grams of ice at 0oC. The molar heat of fusion for ice is 6.02 kJ/mol.

Sample problem 2: Calculate the energy released when 15.5 g of water freezes at 0oC. The molar heat of fusion for ice is 6.02 kJ/mol.

Putting together Specific Heat and Changes of State

Sample problem 3: Calculate the energy in kJ required to heat 25 g of liquid water from 25oC to steam at 100oC. The specific heat of water is 4.18 J/g . oC and the molar heat of vaporization is 40.6 kJ/mol.

Sampler problem 4: Calculate the energy in kJ required to change 22.5 g of ice at 0oC to steam at 100oC. Use constants from previous problems.

Sample problem 5: How much energy in kJ is required to change 10.0 g of ice at -15.00C to steam at 105.0oC?

What other numbers will we need?

EVAPORATION AND VAPOR PRESSURE

Vaporization/Evaporation

Vapor Pressure



Volatile

Nonvolatile

Sample problem 6: Predict with substance in each of the following pairs will show the largest vapor pressure at a given temperature

1. H2O(l) CH3OH(l)
2. CH3OH(l), CH3CH2CH2CH2OH(l)

BOILING POINT AND VAPOR PRESSURE

THE SOLID STATE: TYPES OF SOLIDS

Crystalline solids

* Ionic solids



* Molecular solids



* Atomic solids



Bonding in Metals

Electron sea model

Alloys

* Substitutional Alloy
* Interstitial Alloy

Sample problem 7: Name the type of crystalline solid formed by each of the following substances

1. Ammonia
2. Iron
3. Cesium fluoride
4. Argon
5. Sulfur (S8)



Interpreting phase diagrams