**Chemistry NCFE Guided Review 2.1**

**(Heat and Gas)**

**2.1.1 Explain the energetic nature of phase changes.**

* Physical equilibrium (liquid water-water vapor): vapor pressure depends on \_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_ of particles in solution.
  + Lower temp/concentration = \_\_\_\_\_\_\_\_\_\_\_\_ VP
* When kinetic energy is added to a substance, the particles \_\_\_\_\_\_\_\_ \_\_\_\_\_\_ and begin to \_\_\_\_\_\_\_\_\_\_ (opposite happens when they are cooled).
* Phases of matter are determined by \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_
* Heat =
  + Unit:
* Temperature =
  + Unit:
  + Unit:

**2.1.2 Explain heating and cooling curves (heat of fusion, heat of vaporization, specific heat, melting point, and boiling point).**

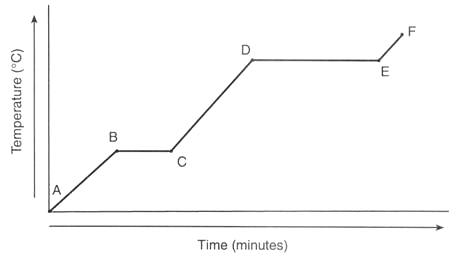
* Specific Heat Capacity:
  + Symbol:
  + Unit:
  + Usually given on reference table
* Heat of Fusion:
  + Symbol:
  + Unit:
  + Given on reference table (for water)
* Heat of Vaporization:
  + Symbol:
  + Unit:
  + Given on reference table (for water)

Equations

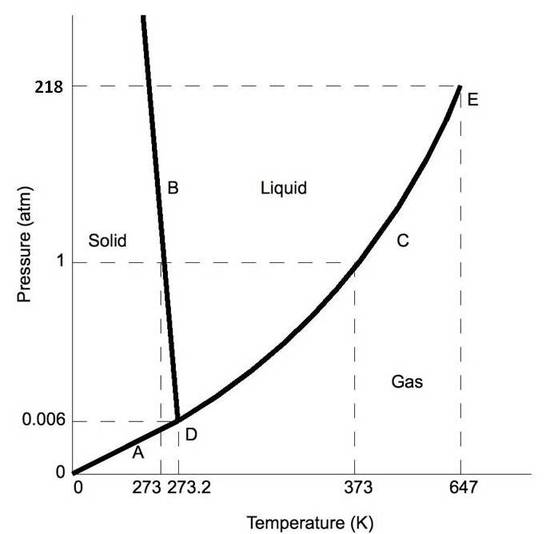
* q = mCΔT
  + Pay attention to units! They matter!
  + If q is negative, heat was \_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_\_\_\_\_\_\_\_)
  + If q is positive, heat was \_\_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_\_\_\_\_\_)
* q = mHf
  + used for \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_
  + Might have a temp in the word problem, ignore it! It’s extra information.
* q = mHv
  + used for \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_

**2.1.3 Interpret the data presented in phase diagrams.**

Thermochemistry/Phase Graphics



* A-B =
* B-C=
* C-D=
* D-E=
* E-F =



* A =
* B =
* C =
* D =
* E =

**2.1.4 Infer simple calorimetric calculations based on the concepts of heat lost equals heat gained and specific heat.**

* For a closed system, energy is neither lost nor gained, but \_\_\_\_\_\_\_\_\_\_ from one component to another.
* So, qlost = -qgained
* For example, if one component loses 100 J of heat (-q), the other component gained 100 J of heat (+q).
* Objects with \_\_\_\_\_\_\_\_ specific heat require \_\_\_\_\_\_\_ energy to change temperature.

**2.1.5 Explain the relationships among pressure, temperature, volume, and quantity of gas, both qualitative and quantitative.**

* Ideal gas characteristics:
  + Adhere to all aspects of kinetic theory

**-**

**-**

**-**

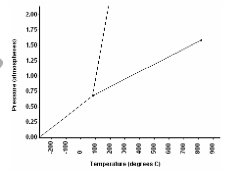
* Be able to manipulate/use the following equations:
  + PV = nRT
    - Make sure the R unit and the P/V unit match!
    - Make sure to use K for temperatures!
  + P1V1 / T1 = P2V2 / T2
    - Make sure T is in Kelvin (K) and that all other units match!
  + n1/V1 = n2/V2
    - THIS IS NOT ON THE REFERENCE TABLE! MEMORIZE IT!
  + Pt = P1 + P2 + P3 ….

**Sample Questions**

1. What causes the process of perspiration to be cooling for human skin?

1. It involves condensation and is exothermic.
2. It involves evaporation and is exothermic.
3. It involves condensation and is endothermic.
4. It involves evaporation and is endothermic.

2. According to the phase diagram below, what is the boiling point of this substance at a pressure of 1.25 atmospheres?



1. 100oC
2. 150oC
3. 300oC
4. 500oC

3. 1000 J of heat is added to 2 g of the following substances. Which one will experience the biggest change in temperature?

1. aluminum
2. copper
3. iron
4. lead

4. What causes an inflated balloon to shrink when it is cooled?

1. because cooling the balloon causes gas to escape from the ball
2. because cooling the balloon causes the gas molecules to collide more frequently
3. because cooling the balloon causes gas molecules to become smaller
4. because cooling the balloon causes the average kinetic energy of the gas molecules to decrease