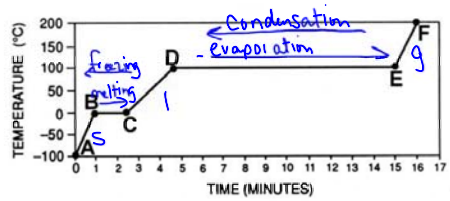
Review:

1. Temperature is a measure of the Average Kinetic energy of the molecules in a sample.
2. A gas exerts pressure on its container because the molecules collide with the walls.
3. According to the assumptions of KMT...
   > The molecules of an ideal gas are in constant, random motion.
   > The molecules of an ideal gas have no volume.
   > Collisions in an ideal gas are completely elastic.
   > There are no attractive or repulsive forces in an ideal gas.

Feb 3-10:21 AM

Review:

Use the graph to answer the following questions:



1. What letters (area) represents the melting point? B - C
2. What letters (area) represents the substance in the gaseous phase? E - F
3. Write the equation, include energy for the process happening as you move from C - B. Is this endothermic or exothermic? l → s + energy exothermic
4. Based on the temperatures, what substance is represented in the graph? H_2O

Feb 3-10:21 AM

Practice

Complete the chart below:

Relationship	Pressure	Volume	Temperature	# of moles
direct	increases	constant	increases	constant
indirect	increases	decreases	constant	constant
direct	constant	increase	increases	constant
direct	increases	constant	constant	increases

Feb 3-10:21 AM

Practice

What will have to happen to the temperature of a sample of methane if 1000 mL at 98.6 kPa and 25°C is given a pressure of 108.5 kPa and a volume of 900 mL?

Combined $\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$

25 + 273 = 298 K

$\frac{98.6\,kPa \times 1000\,mL}{298\,K} = \frac{108.5\,kPa \times 900\,mL}{T_2}$

$98.6\,kPa \times 1000\,mL \times T_2 = 298\,K \times 108.5\,kPa \times 900\,mL$

$(98.6\,kPa \times 1000)$

$T = 295\,K$

Feb 3-10:21 AM

Practice

How many moles of gas are in a 30.0 liter scuba canister if the temperature of the canister is 300.0 K and the pressure is 200.0 atmospheres?

Ideal PV=nRT

$200.atm \times 30.0L = n \times .0821 \times 300.0K$

$(.0821 \times 300.0K)$

n = 244 moles

Feb 3-10:21 AM

Practice

How many grams of calcium carbonate will I need to form 3.45 liters of carbon dioxide at a pressure of 1.0 atm and a temperature of 298K?

$CaCO_{3(s)} \rightarrow CO_{2(g)} + CaO_{(s)}$

? g $CaCO_3$ 3.45L

PV = nRT

$1.0atm \times 3.45L\,CO_2 = n \times .0821 \times 298K$

$(.0821 \times 298K)$

$n = .141\,mol\,CO_2 \times \frac{1\,mol\,CaCO_3}{1\,mol\,CO_2} \times \frac{100.0893\,g\,CaCO_3}{1\,mol\,CaCO_3}$

14.1g $CaCO_3$

Feb 3-10:21 AM

Practice

If excess HCl is dripped onto 15.0 g of $KMnO_4$, what volume of Cl_2 will be produced at 15°C and 0.959 atm?

2 $KMnO_4$ ... $_2O(l)$ +5 $Cl_2(g)$

15.0g ?L Cl_2

$15.0g\ KMnO_4 \times \frac{1\ mol\ KMnO_4}{158\ g\ KMnO_4} \times \frac{5\ mol\ Cl_2}{2\ mol\ KMnO_4} = .237\ mol\ Cl_2$

$PV = nRT$

$V = \frac{.237\ mol\ Cl_2 \times .0821 \times 288K}{.9\ atm}$

$V = 5.84\ L\ Cl_2$

Feb 3-10:21 AM

Practice

How many liters of water can be formed if 1.25 liters of ethylene are consumed in this reaction? (assume STP)

$C_2H_{4(g)} + 3\ O_{2(g)} \rightarrow 2\ CO_{2(g)} + 2\ H_2O_{(g)}$

1.25L ?L

$1.25L\ C_2H_4 \times \frac{2\ L\ H_2O}{1\ L\ C_2H_4} = 2.50\ L\ H_2O$

Feb 3-10:21 AM

Practice

How many liters does 3.75 mol of nitrogen gas occupy at STP?

?L

$3.75\ mol\ N_2 \times \frac{22.4\ L\ N_2}{1\ mol\ N_2} = 84.0\ L\ N_2$

OR

$1\ atm \times V = 3.75\ mol \times .0821 \times 273K$

Feb 3-10:21 AM