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MAINLAND LECTURE CENTER

CHM103: INTRODUCTORY PHYSICAL CHEMISTRY I

A____is a ratio that is equal to I.
unit factor

___arc basically used for determining the melting points of substances.
Melting point tubes

The____thermometer IS used as the Beckman·s apparatus for dctem1inmg the freezing pomt of a substance
Beckman

____is used for measuring the strength of an acid or base
PH meter
____is used for measuring pressure and can be found useful m Barometric method of measuring vapour pressure
barometer

____IS used for measuring the viscositY of a subsrance
An Ostwald viscometer

The formation of a solid from a solution is called **precipitation.**

_____IS the process of separating a pure solid from a solution
Crystallisation

____refers to a process in which the solid directly evaporates without it melting
sublimation

At high temperature and low pressure. gases tend to _____
expand

the S.I unit of pressure is _____
pascal (Pa)

The relationship between the volume and the pressure of a given mass of a gas at a given temperature is known as _____
Boyle's law

when the pressure is likely to vary linearly with the temperature. This observation describes what is called _____
Charles' law

the unit of temperature is called_____
kelvin

pV=nRT,the equation is known as _____
the equation of state for an ideal gas

The gas that obeys the gas laws exactly for all conditions of pressure and temperature is referred to as an _____
ideal gas

The individual pressure of a gas in a mixture of gases is called its _____
partial pressure.

Effusion is the passage of a gas through a small opening into an evacuated chamber

Graham·s law states that the rates at which gases effuse are inversely proportional to the square root of their densities or molar masses under similar conditions of temperature and pressure

The central idea that gas molecules are in contmuous motion is called a theory termed _____
kinetic theory of gas.

pressure is the_____
force per unit area

_____.is defined as the number of molecules of a gas in unit volume. We can obtainnumber density by re-:uranging the equation
Number density

The real gases obey ideal gas laws onlv at low pressures. and_____temperatures
high

$\{P+\ )V\text{-}nb)=nRT$

this equation is reffered to as_____
Van deer Waals equation

when real gas that is subjected to high pressure and sufficiently low temperatures,the gas will liquefy but the temperature above. which the gas will not liquefy no matter what pressure is applied.this temperature is called the **critical temperature (T,)** of the substance

The pressure that is required to liquefY a gas at its critical temperature is called its **critical pressure (Pc)**

The volume occupied by one mole of a fluid at its criticC>I tc"'perature and pressure is called _____
critical volume (V,)

Liquefaction is a process of making a gas or solid to become liquid

According to_____effect when a gas under high pressure is to expand into a region of low pressure, its temperature falls
Joule-Thompson

Polar molecules can attract each other electrostatically. During this attraction the positive end of one molecule is close to the negative end of the adjacent molecule,such attraction is called_____
dipole-dipole interaction

_____- can explain the attractive torces between polar molecules at ordinarY temperatures whereas athigh temperatures it cannot
Dipole-Induced Dipole Interaction

The ability of a species to undergo electronic distortion is described in terms of_____
polarisability

Polar molecules have higher melting and boiling points than the non-polar molecules of similar molecular size

the solids can be of two types- Crystalline and _____
Amorphous.

Those solids, which are formed due to regular repetition of identical building blocks. are called_____
crystals

there are solids which do not appear to have any regular internal arrangement in every pa1t and thus do not show regular shape: these are called **amorphous solids**

Lattice is defined as an arrangement of geometrical points in a definite pattern in space The **unit**

cell is the .fimdamental unit in a crystal

Crystal planes arc represented by certain numbers is known as _____
Miller indices

The structure of a **bee crystal** can be defined in terms of unit cell-edge length and two unique positions in the cell.

In **molecular crvstals**. the molecules are held together due to Van der Waals interaction

Semiconductors are solids which are insulators under normal conditions but become conductors when heated or doped with impurities.

The electrical conductivity of a semiconductor increases with **temperature the**

semiconductors can classified into **two** types which are_____
Intrinsic Semiconductors
Extrinsic Semiconductors

Semiconductors with impurities are called_____semiconductors
extrinsic

When a semiconductor is doped with an impuritv having more valence electrons than those in the semiconductor. a_____semiconductor is produced
n-type

The presence of a surface in a liquid gives rise to the phenomenon of **surface tension**

Some of the factors, which influence the magnitude of surface tension. are_____
Molecules having strong hydrogen-bonds have high surface tension
Metallic bonding also lead to high surface tension.

The dispersion forces are quite significant in molecules with large atoms and are often more important
than dipole-dipole forces

Intermolecular forces give rise to capillary action.

The_____forces are the intermolecular forces among the molecules of a liquid
cohesive

The amount ofheat required at constant pressure to convert one mole of a solid into liquid at its melting point is called _____
molar enthalpy of fusion

the amount of heat required at constant pressure to convert one mole of a liquid into its vapour at its boiling point is called the _____
molar enthalpy of vaporization

The escape of molecules from the liquid surface to form vapour is called _____
vaporization or evaporation

As the temperature of a liquid **increases**, the average kinetic energy of the molecules also **increases**

The temperature at which the vapour pressure of a liquid equals the external pressure is called its_____
boiling point

At_____. the vapour produced in the interior of the liquid results in continuous bubble formation that is characteristic of boiling.
boiling point

The boiling point **increases** as external pressure **increases** and the boiling point **decreases** as external pressure **decreases**

The ratio of molar enthalpv of vaporization of a liquid to its boiling point isapproximately _____
85 J mol·' K '

Gases and liquids are _____
isotropic

Smectic Liquid crystals have molecules arranged in parallel layers or planes.

Nematic Liquid Crystals have all the molecules within the same orientation

Cholesteric liquid crystals have a multiple layer structure. hut each successive layer is inclined or twisted slight

A **phase** 1s a homogeneous part of a system which 1s susceptible to change on certain conditions the

Factors affecting Solubility of Gases are_____
Temperature
Pressure
Nature of the gas and the solvent

The partial vapour pressure of any volatile component in a solution is equal to the product of the vapour pressure of the pure component and its mole fraction in the solution is reffered to as_____
Raoult's Law

A solution that obeys Raoult's law at all concentrations and atall temperatures is called an _____
ideal solution.

___are solution that olutions do not obey Raoult's law
Non Ideal Solutions

The vapour pressure of a solution containing 0.0 12 kg of a solute dissolved in 0. I 00 kg of water at 300 K is 3.50 X I O' Pa. Calculate the molar mass of the solute, if the vapour pressure of water at 300 K is 3.70 x 103 Pa.

0.040.kg mol·'

In_____method, the solvent or the solution is heated lo its boiling point by passing the vapours of the solvent through them.
Tbe Landsberger Method

The **number of components** (c) in a system is the smallest number of substances in terms of which the composition of all the phases in the system can be described separately

The **number of degrees of freedom** (F) or variance of a system is the smallest number of intensive variables. such as pressure, temperature and composition, which are to be specified to describe the state of the system completely

One of these is not a factor which affects the solubility of gases
concentration of solvent

Which of these is not correct about gaseous molecules
at very low pressures or high temperatures. the gases obey ideal gas equation and their z value is nearly equal to unity

When two liquids A and B arc mixed completely there are three possibilities
Liquid A and liquid B vapourises in to vapour saturated all proportions

Which of these followings would lead to an increase in the internal energy of a system?
Work done on the system

Which of the following statements about enthalpy is incorrect?
Enthalpy and internal energy of a system are always identical

One of these is correct about common-ion effect
reduces ionization

the number of moles of the solute present in $$ I dm^{3}$$ of the solution refers to as_____
Molarity

"The_____of a solute in a solution is the ratio of the number of moles of a solute to the total number of moles of the solute and the solvent in a solution
mole fraction

According to_____the partial vapour pressure of any volatile component in a solution is equal to the product of the vapour pressure of the pure constituent and its mole fraction in the solution
Raoulfs law

The process in which the solid directly evaporates without it melting is known as_____"
sublimation

What does it mean if the ΔH value for a chemical reaction is positive?
reactants have less potential energy than products

Which of these is not an intermolecular force?
electrovalent bonding

The process of obtaining liquid from solid or gas through melting or condensation processes is appropriately described as
Liquefaction

The temperature above which the gas will not_____no matter what pressure is applied is termed the critical temperature
liquefy

Ethanol has higher boiling point than butane although the latter has higher relative molecular mass because of"
hydrogen bonding existing between oxygen and hydrgen atoms of the ethanol functional group

In a reaction in which the rate of the reverse reaction is equal to the rate of the forward reaction, a state of _____is attained.
dynamic equilibrium

Solids which are formed due to regular repetition of identical building blocks are called crystals
Crystalline solids

The electrical conductivity of a semiconductor increases with_____."
temperature

Which of the following involves a decrease in entropy?
the freezing of liquid water into ice

The pressure necessary to liquefy a gas at its critical temperature is called its_____"
critical pressure

The temperature at which the Joule-Thomson coefficient is zero for a gas is called_____"
inversion temperature

Which of these instruments measures the strength of acids and base
pH mete

Which of these is not correct about adiabatic expansion
internal energy increases

The_____is defined as the temperature above which a substance can exist only in the gaseous state" crittcal temperature

All are basic physical quantities except_____"
Density

_____state that a certain amount of gas at a constant pressure, its volume (V) is directly proportional to its absolute temperature (T)
Charle's law

If the initial volume of a gas was 500 mL at a pressure of 760 torr, when the volume is compressed to 450 mL, what is the pressure?
844 torr

The rest of the universe around a system is described as"

Surroundings

The balloon used by Charles in his historic flight in 1783 was filled with about 1300 mole of H2.Â If the outside temperature was 21Â oC and the atmospheric pressure was 750 mm Hg, what was the volume of the balloon?
Â $$ 3.2 x 10^{4}Â L$$

A sample of H2Â was prepared in the laboratory by the reaction: $$ Mg(s) + 2 HCl(aq) MgCl_{2}(aq) + H_{2}(g)$$. 456 mL of gas was collected at 22.0 oC. The total pressure in the flask was 742 torr. How many moles of H2 were collected? The vapor pressure of H2O at 22.0 oC is 19.8 torr.
0.0179Â mole

One of the following pair cannot constitute suitable pair for n-type conductor?
Antimony: Arsenic

One of the following is not true about n-type conductor
There is no chemical but physical interaction between the impurity and the semi conductor

One of the following is not a right pair for p-type semi conductor
Aluminium: indium

One of the following is not associated with the conductivity of semi conductors due to doping
o-type

One of the following is not a class of crystal solids
Hydrogen bonded

One of the following does not describe the crystal structure of metallic solid
Trigonal-close packing

The unit of one of the following quantity is a derived unit
Momentum of electron

When iron metal corrodes, its colour changes to _____
Brown

One of the following is not a chemical instrument
Filter paper

The pressure exerted by 0.5 cm3 of gas is 1 Pa at 273 K. If the temperature of the gas changes to 546 K and its pressure to 3 Pa, what will be the new volume of the gas
0.3 cm3

One of the following combination does not match for gas law
Gay-Lussac law : Constant volume

If 3.00 litre sample of gas at 1.00 atm is compressed to 0.600 litre at constant temperature. Calculate the final pressure of the gas
5.0 atm

Calculate the volume which 6.00 litres of gas at 0 °C will occupy at 125°C at constant pressure
8.75 litres

Calculate the volume occupy by 32 g of oxygen at stp
44.8 dm3

One of the following is not correct
1 atm = 1 Pa

Calculate the volume occupied by 0.0660 kg of carbon (IV) oxide gas at a temperature of 300.2 K and a pressure of 9.41 x I0 Pa assuming ideal behaviour
0.0398m3

Hydrogen bonding may not affect the physical properties of one of the following molecules
CsF

Which of the following pair does not agrees with the kinetic theory of gases
Temperature = Average collision

The length of one axis of a cubic crystal is 0.05 cm. What is the length of the next minimum axis?
0.05 cm

Which of the following is not true about Graham's law
Diffusion rate is proportional to density

Use Dalton law to calculate the total vapour pressure exerted by a mixture of A and B if the following data were obtained; XA = 0.40, XB = 0.60, PA0 = 1710 mm/Hg and PB0 = 127 mm/Hg
760 mm/Hg

Which of the following pair does not match?
Hexagonal:K2O

Which of the following pair does not match?
Hexagonal: a=b=c

Which of the following salts can form precipitate
AgCl

The value of the gas constant R is often expressed as I 987 cal moJ-1 K 1 • Obtain its value in SI units (Given 1 ca; = 4.184 J)
8.314 J/mol/K

16 g of oxygen gas occupies a volume of 22.4 dm3. Calculate the density of the gas
0.000714 g/dm3

The concentration of an acid in a sample can be estimated by _____
Titration

Consider four gases whose densities are (i) 0.2, (ii) 0.4, (iii) 0.6 and (iv) 0.8 g/cm3. The order of diffusion will be
i>ii>iii>iv

The pressure of air in a system is 10 Pa and the volume occupied is 4 m3. If the the volume is increased to 16 m3, what will be the new pressure

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2.5 pa

The order of intermolecular distance among the three state of matter is _____
Gas>liquid>solid

The product of pressure and volume of a gas at 300 K is 500 Pam3. Calculate the number of moles of the gas
0.2

2 moles of water was mixed with 3 moles of ethanol. The ratio of the mole fraction of ethanol to that of water is __
1.5

An ideal gas will not obey one of the following law
Van der waal

A real gas will obey one of the following law
Van der waal law

A solute was dissolved in two separate immiscible solvent. If 2.0g of the salt dissolve in the first solvent and 4.0g dissolved in the second solvent. Calculate the partition coefficient if the two solution are combined together
0.5

Modern approach to chemistry deals with equilibrium properties, ability to change and _____
Structure

Physical Chemistry is concern with two major aspects, namely ability to change and •••••••••• _____
Equilibrium properties

International system of unit or systeme internatwnale can be written as an acronym _____
SI unit

Temperature, length, time and mass are examples of _____
basic quantities

Meter, kelvin, second and kilogram are examples of _____
Basic units

A skilful process of identifying. substituting and using correct apparatusappropriately in the laboratory is called __
Instrumentation

Apparatus that arc basically used for determining the melting points of substances are called

_____
melting point tubes

FBQ8: The Beckman thermometer IS used in the Beckman·s apparatus for dctem1inmg_____of a substance
Freezing point

_____is an instrument that can be used to measure the strength of an acid or abase
pH meter

A homogenous materials that contain only one substance is called a _____
pure substance

Constituents in a solution can be separated by applying the principle of _____
Equilibrium

The process of separating a pure substance from a solution is called _____
crystallization

In a gas. the molecules on the average are separatedby large_____distances
Intermolecular

_____is a state of matter that does not have a definite shape nor volume
Gas

At constant temperature, the gas law that is most suitable is called_____law
Boyle's

At constant pressure, properties of gases that undergo changes are _____
volume and temperature

A gas that obeys all the gas laws is called an _____
ideal gas

At high temperature and low pressure, gases tend to undergo phenomena that is called _____
Expansion

At low temperature and high pressure, gases tend to _____
Contract

The temperature, above which a substances can exist only in gaseous state is called _____
Critical temperature

The mathematical equation for Boyle's law can be written as _____
PV = constant

The mathematical equation for Charles law can be written as _____
V/T = constant

A plot showing the variation of volume with temperature at constant pressure is called _
An isobar

An expression for the combined gas law can be expressed as _____
PV/T = constant

The equation of ideal gas can be expressed as _____
PV = nRT

Numerical value of the universal gas constant is_____J/K/mol
8.314

The volume occupied by 1 mole of oxygen gas at s.t.p. is_____dm3
22.4

The individual pressure of a gas in a mixture of gases is called _____
Partial pressure

The gas law that consider the total pressure of a gas as a function of the pressures exerted by the individual gases that make up the mixture is _____
Dalton law of partial pressure

For 1 mole of an ideal gas, a plot of PV against T will give a straight line whose slope is equal to

_____
8.314

The rate at which gases diffuse is inversely proportional to the Square root of their _____
Densities

The gas law that explain the effusion of gas is _____
Graham law

Gas molecules confined to a container are in a state of_____motion
Constant

At relatively low pressure, there are no_____forces between gas molecules
Intermolecular

_____of a gas is proportional to the mean kinetic energy of the molecules in a gas
Absolute temperature

The electrical conductivity of a semiconductor increases with_____.
Temperature

When the temperature is lowered. gases tend to_____
Contract

The gas that obeys the gas laws exactly for all conditions of pressure and temperature is referred to as an _____
Ideal gas

Which law does the mathematical expression represents, PV = nRT,
Ideal gas law

The total pressure exerted by a mixture of two different gases is equal to the sum of the individual pressures of the two different gases, Which gas law is this?
Dalton's Law of Partial Pressures or Dalton's Law

_____is the passage of a gas through a small opening into an evacuated chamber
Effusion

The diffusion depends greatly on the_____of the gas molecules.
Masses

The absolute temperature of a gas is proportional to the mean kinetic energy of the molecules present in It. TRUE or FALSE
TRUE

One application of Graham's law is the gaseous diffusion method of separating _____
Isotopes or Isotope

If the_____is reduced sufficiently, the boiling point of a liquid may even fall below the melting point of a solid whereby the substance is said to be sublime
Pressure

The_____rule with reference to phase study is that phase with the lowest chemical potential, is the stable phase
Golden

The number_____of a system is the smallest number of intensive variables which are to be specified to describe the state of the system completely
Degrees of freedom or Variance

Intensive property is one whose magnitude is independent of the_____of the system
Size

An_____is one whose magnitude is additive for subsystems
Extensive property

The_____in a system is the smallest number of substances in terms of which the composition of all the phases in the system can be described separately
Number of components

Lowering of vapour pressure is not a colligative property. TRUE or FALSE
FALSE

According to_____law relative lowering of vapour pressure is equal to the mole fraction of the solute
Raoult's

The____of the solution containing a non-volatile solute is higher than that of the pure solvent.
Boiling point

The addition of a non-volatile solute to a solvent_____the vapour pressure of the solvent
Decrease

The temperature at which the solubility becomes complete is referred to as the _____
Consolute temperature or Critical solution temperature

A pair of immiscible liquids boils at a temperature lower than the_____of any of the liquids
Boiling points

Water and carbon tetrachloride are miscible in all proportion. TRUE or FALSE
FALSE

The_____is a process of purifying organic liquids which have high boiling points and are immiscible with water
Steam distillation

Non-ideal solutions do not obey Raoult's law. TRUE or FALSE
FALSE

A_____is a homogeneous part of a system which is susceptible to change on certain conditions
Phase

the ratio of molar enthalpy of a liquid to its boiling point is known as _____
Trouton's rule

<p/>_____is the name given to the theoretical frame that throws light on the baseline of the experiment.
Theory

_____is the process of separating a pure solid from a solution.
Crystallization

The constant bombardment of gas molecules against the walls of the container gives rise to _____
Pressure or Gas pressure

Convert 24 °C to Kelvin _____
297.15 K

Find the volume occupied by 0.0660 kg of carbon (IV) oxide gas at a temperature of 300.2 K and a pressure of 9.41 x I0 Pa assuming ideal behaviour._____
0.0398

The mass of the solute that can be dissolved in 0.100 kg of a solvent to form a saturated solution at a given temperature is called its_____.
Solubility

In the band theory of metals, a crystalline metallic solid is considered as a_____.
Single giant molecule

_____is defined as the number of moles of solute present in one kilogram of solvent.
Molality

The escape of molecules from the liquid surface to form vapour is called_____.
Evaporation or Vaporization

A unit factor is a ratio that is equal to _____
I

Which of these apparatus is basically used for determining the points at a solid substance turns to a liquid substance?
Melting point tube

vapour pressure can be measured using one of the following apparatus
Barometer

_____is for the measurement of the strength of an acid or base
pH meter

mixtures are separated us1ng appropriate techniques which depend on all of the following except:
Percentage purity of the substance

One of these is not a main separation process for separating mixtures
sieving

The process in which the solid directly evaporates without it melting is known as _____
sublimation

Which of these techniques is not a separation techniques for separating mixtures?
electroanalytical

One of these substances cannot undergo sublimation
CaCl₂

A substance which has mass and occupies space is appropriately described as_____
Matter

The_____is defined as the temperature above which a substance can exist only in the gaseous state.
critical temperature

A sample of H₂was prepared in the laboratory by the reaction: Mg(s) + 2 HCl (aq) → MgCl₂ (aq) + H₂(g). 456 mL of gas was collected at 22.0 ^oC and the total pressure in the flask was 742 torr. How many moles of H₂ were collected? The vapour pressure of H₂O at 22.0 ^oC is 19.8 torr.
0.0179 mole

The relationship between the volume and the pressure of a given mass of a gas at a given temperature is known as _____
Boyle's law

For a certain amount of gas at a constant pressure, its volume (V) is directly proportional to its absolute temperature (T). The relationship between temperature and volume describes _____
Charles law

_____ states that the rates at which gases effuse are inversely proportional to the square root of their densities or molar masses under similar conditions of temperature and pressure
Graham's law

One of these statements is incorrect about the postulate of kinetic theory of gas
At relatively low pressure. there are strong intermolecular forces between the molecules

Which of these is a vector quantity?
Velocity

One of these is not an intensive variables
Volume

One of these is not correct about Colligative properties
Colligative properties are dependent of the nature of the solute

Determination of Boiling Point Elevation may be done using one of the methods listed below:
Landsberger Method

Determination of vapour pressure lowering can be achieved by one of the methods
Dynamic Method

The temperature at which a pair of partially miscible liquid becomes completely miscible is called _____
critical solution temperature

The distribution or partition coefficient, K, of the solute between the two solvents, depends on all the following except;
Pressure

One of the following is incorrect about purification process of an impure compound by steam distillation.
Must be miscible in water

An_____solution is one which can be formed from two constituents with no evolution or absorption of heat and whose volume is the sum of the volumes of each of the constituents
ideal binary

_____ states that the partial vapour pressure of any volatile component in a solution is equal to the product of the vapour pressure of the pure constituent and its mole fraction in the solution
Raoult's law

Which of these is not a characteristic properties of liquids?
Closely parked and very orderly crystal structure

All are factors affecting solubility of gases except
concentration

One of the following pair cannot constitute suitable pair for n-type conductor?
Antimony: Arsenic

A gas sample contains 4.0 g of CH₄ and 2.0 g of He; the volume of the sample at STP is _____dm³. (C = 12, H = 1, He = 4, G.M.V = 22.4 dm³
5.6

One of the following is not associated with the conductivity of semi conductors due to doping
o-type

Calculate the volume occupied by 0.0660 kg of carbon (IV) oxide gas at a temperature of 300.2 K and a pressure of 9.41 x I0 Pa assuming ideal behaviour
0.0398m³

If 3.00 litre sample of gas at 1.00 atm is compressed to 0.600 litre at constant temperature. Calculate the final pressure of the gas
5.0 atm

The pressure exerted by 0.5 cm³ of gas is 1 Pa at 273 K. If the temperature of the gas changes to 546 K and its pressure to 3 Pa, what will be the new volume of the gas
0.3 cm³

One of the following is not a class of crystal solids
Hydrogen bonded

The temperature above which a gas will not liquefy no matter what pressure is applied is known as
Critical temperature

The plot of solubility against temperature is called the_____
Solubility curve

_____is the fundamental unit in a crystal.
Unit cell

In Charles' law, the volume of a gas_____when the temperature
Decreases
decreases

The escape of molecules from the liquid surface to form vapor is called
Evaporation Or Vaporization_____

In fractional distillation, the process of successive vaporization and condensation is carried out in a
_____
Fractionating column

A liquid that has high viscosity flows slowly, true or false?
true

In the kinetic molecular theory of gas behavior, collisions between them are_____(elastic/inelastic)
elastic

According to the kinetic theory, the kinetic energy of a gas is a measure of its
temperature

_____is used for measuring the viscosity of a substance.
Ostwald viscometer

A temperature of 125 °C is the same as_____K.
398

The SI unit for energy is_____
Joule

A gas sample contains 4.0 g of CH_{4} and 2.0 g of He; the volume of the sample at STP is
_____dm^{3}. (C = 12, H = 1, He = 4, G.M.V = 22.4 dm^{3})
5.6

Air as a mixture of gases.Thus it is a_____phase system
Single

The entropy of vaporization is almost the same value for various kinds of liquids at their boiling point.This statement is known as_____
Trouton's rule

The rates at which gases effuse are inversely proportional to the square root of their densities or molar masses under similar conditions of temperature and pressure. This is_____
Boyle's

_____is used to measure the strength of an acid or base.
pH meter

According to_____law, when the pressure of a gas increases at constant temperature, its volume decreases.
Boyle's

At STP, the number of moles of helium that would occupy 1dm^{3} is_____moles.
0.0446

The type of bond that exists in water and hydrogen fluoride is_____
Hydrogen bond

The SI unit of temperature is_____
Kelvin

The gas molecules confined to a container are in a state of constant rapid random motion. True or false?
true

_____is a regular periodic arrangement of points in space.
Lattice

A thermometer is usually filled with_____
mercury

Number of moles present per dm3 of a substance is called_____
Molarity or molar concentration

The solubility of a gas in a liquid is measured in terms of_____
Absorption coefficient or Bunsen coefficient

The amount of heat required at constant pressure to convert one mole of a liquid into its vapor at its boiling point is
called the_____
Molar enthalpy of vaporization.

The opposite of vaporization is called_____
condensation

When a solute present in a solution is in very minute amounts, the concentration is usually expressed in_
Parts per million (ppm)

_____is defined as the number of solute present in 1 L of the solution.
Molarity

Electric resistance is measured in_____

Ohm

An ideal solution obeys_____law at all temperatures.
Raoult's

A solid becomes liquid by_____
Melting

The formation of a solid from a solution is called_____
Precipitation

Crystal planes are represented by certain numbers known as_____
Miller indices

_____is formed when atoms are attached regularly to each lattice point.
Crystal

The valence bond approach corresponds to the_____
Bond model

Real gases obey ideal gas laws only at_____pressures and high temperatures.
Low

The temperature at which the vapor pressure of a liquid equals the external pressure is called its_____
Boiling point

The process of separating a pure solid from a solution is known as_____
Crystallization

The pressure that is required to liquefy a gas at its critical temperature is called its_____
Critical pressure

The stable form of sulphur at ordinary temperature and under one atmospheric pressure is _____ sulphur
Rhombic

_____is the ratio of molar enthalpy of a liquid to its boiling point.
Trouton's rule

_____is defined as the number of moles of solute present in one kilogram of solvent.
Molality

_____is a physically distinct and homogenous part of the system that is mechanically separable from other parts
of the system.
A phase

The translational energy of an ideal gas is independent of the type and pressure of the gas. True or false?
true

Which is more effective, Claude's method or Linde's method of liquefaction of gases?
Claude's method

In the band theory of metals, a crystalline metallic solid is considered as a_____
Single giant molecule

The mass of the solute that can be dissolved in 0.100 kg of a solvent to form a saturated solution at a given temperature is called its_____
solubility

The rates at which gases effuse are inversely proportional to the square root of their densities or molar masses under similar
conditions of temperature and pressure. This is a statement of_____
Graham's law of effusion

The SI unit for frequency is_____
Hertz

Velocity is a vector quantity. True or false?
true

The separation methods which is based on the difference in boiling points of liquids is_____
distillation or fractional distillation

At relatively low pressure, there are no intermolecular forces between the molecules. True or false?
true

Ideal solutions can be separated into two fractions by_____
Fractional distillation

The unit of temperature is used in gas law calculations is_____
Kelvin or K

The volume of a gas with a pressure of 1.2 atm increases from 1.0 L to 4.0 L; the final pressure of the gas, assuming constant
temperature, is_____
0.3 atm or 0.3 atmospheres

A liquid will "wet" a surface if: _____
the forces between the molecules and the surface are greater than the forces between the molecules of the liquid

Which of the following statements is false?
Molecules of $CH_4(g)$ at high pressures and low temperatures have no attractive Forces between each other.

The Henry's law constant for helium gas in water at 30 °C is 0.00037 M/atm. When the partial pressure of helium above a sample of water is 0.650 atm, the concentration of helium in the water is_____M.
0.000241

A solution is prepared by dissolving calcium chloride in water and diluting to 500.0 mL. If this solution contains 44 ppm chloride ions, the concentration of calcium ions is_____ppm.
22

Which of the followings will not diffract X-rays?
Gas

According to the kinetic theory of gases, a gas can be compressed much more than a liquid or solid because
the particles of a gas are very far apart

A mixture of iron filings and copper filings could best be separated by …
magnetic separation

Which of these alkanes is expected to have the highest viscosity?
Decane

Which one of the following statements most accurately relates the properties of a liquid at room temperature with its intermolecular forces?
A liquid with Strong intermolecular forces will probably have a high surface tension and a high boiling point

Which measurement describes the pressure of a gas?
725 mm Hg

What is the average speed (actually the root-meansquare speed) of a neon atom at 27 C?
610 m/s

An atom on the face-centre of a unit cell is shared by_____unit cells
Two

Which of the followings is not a characteristic of an ideal solution?
It must be colourless

Distillation can be used to separate
a liquid from a solution

An ideal gas differs from a real gas in that the molecules of an ideal gas_____.
have no attraction for one another

Ethanol dissolved in water would be an example of _____
a solution between two miscible liquids

A sample of oxygen occupies 47.2 liters under a pressure of 1240 torr at 25 ^{o}C. What volume would it occupy at 25^{o}C if the pressure were decreased to 730 torr?
47.8 L

The concentration of KBr in a solution prepared by dissolving 2.21 g of KBr in 897 g of water is _____ molal.
0.0207

The vapor pressure of pure ethanol at 60 °C is 0.459 atm. Raoult's Law predicts that a solution prepared by dissolving 10.0 mmol naphthalene (nonvolatile) in 90.0 mmol ethanol will have a vapour pressure of _____atm.
0.413

In fractional distillation, a mixture of liquids is separated based on their
boiling points

Which of the following is not a colligative property?
Increase in latent heat

Which statement is true?
As temperature goes up, the solubility of solids goes up.

Which of these terms is not used to describe a solid which remains behind during a separation process?
residue

Which of these is not true of a lattice?
Lattice is present only in ionic solids

Which of these is not true about semiconductors?
They conduct under normal conditions

Which of the following descriptions is correct?
a suspension contains particles which will not settle out if the suspension is left standing

An ideal gas is contained in a volume V at temperature T. If the volume is doubled at constant pressure, the temperature will be_____.
Doubled

Which one of the following statements is not consistent with the kinetic-molecular theory of gases?
The average kinetic energies of different gases are different at the same temperature.

Which statement is false?
The density of a gas is constant as long as its temperature remains constant.

A sample of an ideal gas is held at constant temperature. If the pressure is decreased to ½ P, the volume will be___.
Increased to 2V

A sample of nitrogen occupies 5.50 liters under a pressure of 900 torr at 25^{o}C. At what temperature will it occupy 10.0 liters at the same pressure?
269 ^{o}C

A sample of a salt and water solution is homogeneous throughout. Is this sample a mixture or a pure substance?
a mixture, because it can have a variable composition

Which of the following is a pure substance made up of one type of atoms?
An element

When a liquid is in equilibrium with its vapor in a closed container:
the rate at which molecules from the liquid phase enter the gas phase exactly equals the rate at which molecules from the gas phase pass into the liquid phase

In order to dissolve the greatest amount of sugar in a cup of water,you should_____.
use sugar crushed into small pieces, and heat the water

Which of the following is not true of a liquid's viscosity?
It increases with temperature

The kinetic energy of gas molecules is directly proportional to temperature in_____.
Kelvin

A separation technique which involves charging particles and then attracting them to oppositely charged metal plates is called_____separation
electrostatic

Which of these is a derived physical quantity?
Area

Which of the followings does not influence the magnitude of surface tension?
Ionic bonding

Which of the following statements is true about compounds and mixtures?
Unlike compounds, very little or no exchange of energy occurs during the formation of mixtures.

What is a compound?
A substance which is made up of two or more elements chemically joined together

Which of these is an amorphous solid?
Glass

Which of these mixtures is not a nearly ideal liquid mixture?
water and ethanol

Which of these is not crystalline
Polythene

A liquid that has high viscosity flows_____.
slowly

A container with volume 71.9 ml contains water vapor at a pressure of 10.4 atm and a temperature of 465oC. How many grams of the gas are in the container?
0.222 g

Which one of the following can be separated by adding water, stirring and filtering?
Sulfur and sugar

A mixture of graphite and diamond constitutes_____phases
two

The molarity of urea in a solution prepared by dissolving 16 g of urea (MW = 60.0 g/mol) in 39 g of H_2O is _____M. The density of the solution is 1.3 g/mL.
6.3

The mole fraction of He in a gaseous solution prepared from 4.0 g of He, 6.5 g of Ar, and 10.0 g of Ne is _____.
0.6

Which of these describes what happens when water freezes?
all of the above

In filtration, the term 'filtrate' refers to_____
the liquid that drains through the filter paper.

A gas occupies a volume of 2.4 L at 14.1 kPa. What volume will the gas occupy at 84.6 kPa?
0.40 L

The gaseous mixture is a _____phase system.
one

Standard temperature and pressure (STP) refers to which conditions?
273 k and 1 atm

Fractional distillation cannot be used to_____
test the purity of a substance

The density of a crystal depends on all the following except
Its geometry

Which of these assumes the shape of its container?
Liquid

One of the followings is not true of liquids……
The inability of a liquid to flow enables it to assume the shape of the container

surface tension_____with___in temperature
reduces/increase

the phenomenon of surface tension is as a result of the presence of_____in a liquid
surface

___is the temperatureat which vapour pressure of a liquid equals the external pressure
boiling point

which of these is not true of a semiconductor?
they are just indulators

an increase in temperature of a liquid_____the averages kinetic energy of the molecules
increases

a semi empirical equation that described the relationship between temperature and vapour pressure for pure component is_____equation
Antoine

electrical conductivity of a semiconductor_____with temperature
increases

which of these has a higher surface tension at 298k?
mercury

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the valence elecrons of the impurity used for doping is less than that of the semi-conductors,the impurity can _____to/from valence bond of the semiconductor
accept electrons

solid are different from gases in that they_____
have definite shape

if a quarter of an atom belongs to one unit cell,then the atom is the_____of a unit cell
edge center

which of these is not true of an amorphous substance?
has regular shape

the arrangement of geometrical point in a definite pattern in sace best describes a_____
lattice

the density of a crystal is dependent on the following with respect to the unit except_____
number of neutrons

crystal planes are respresented by certain numbers called_____
miller indices

centers of three adjacent corners and a corner is characteristic of a _____
fee structure

Iionic bond.II.covalent,III,vander waals attraction.which of these chemical bonds is associated with the valence electrons of the atoms in a crystal?
I,II,III

the radioactive decay is a_____order reaction
first

the state of a substance in which the neighvouring particules movement is restricted with respect to its neighbours is called_____
solid state

an atom on the face-enter of a unit cell is shared by_____unit cell(s)
2

Convert 82cm to its equivalent value in SI unit.
0.82m

The Bragg equation is useful in the _____ studies of X-rays by crystals.
Diffraction

Which of the following is correct?
293K

The SI unit of a physical quantity should be/have _____ .
space between the magnitude and the unit symbol of a physical unit

Suppose 15.0g of substance Y occupies a volume of \(37cm^{3}\), what will be its density in SI units?
\(405.40kg/m^{3}\)

The following are dimensions of gas constant except _____.
mass of substance

Electrical conductance can be said to be _____ proportional to electric resistance.
inversely

Which of these is the odd one out?
Volume

Temperature is _____ related to heat.
directly

The SI unit for Luminous intensity is _____.
candela

ML-1T-2 is the dimensional formula for _____ .
pressure

Logarithmic functions are _____ quantities and hence have no units.
dimensionless

_____ are often used in weighing substances.
Balance

It is always advisable to _____ data for effective management.
Tabulate

In application, only _____ gases obey Boyle's and Charles laws.
Ideal

At 0.2oC, Nitrogen gas in a 0.05m3 container has a pressure of 5.065 x 105Pa, the number of moles is _____
11.15

If at 0.2oC, Nitrogen gas in a 0.05m3 container has a pressure of 5.065 x 105Pa, its mass will be _____
312.2g

In line with Dalton's law, in a gaseous mixture, the pressure of a gas is the product of its _____ and total pressure.
Mole function

_____ is the number of molecules of a gas in a unit volume.
Number density

At any given instant, the molecules in a sample of a gas have a range of _____
Velocities

In _____ equation, the pressure is represented as power series of VM.
Virial

The critical volume is inversely proportional to critical _____
density

If the temperature of the gas is above its inversion temperature, Joule Thompson expansion results in _____
heating

Linde's method of liquefaction is _____ efficient than Claude's method.

Less

_____ polarity is a temporary dipolar arrangement of charge.
Instantaneous

A lattice is a regular _____ arrangement of points in space.
periodic

Every _____ is identical in orientation, arrangement and composition.
basis

Metallic solids can be seen as having _____ bonds between adjacent atoms.
covalent

The bond model is the same as the _____ bond approach.
Valence

The bcc crystal can be defined in terms of two _____ positions in the cell.
unique

When a germanium is doped with gallium, the gallium (impurity) is called the _____
Acceptor

Due to strong hydrogen bonding, water has _____ vapour pressure than benzene.
Lower

The successive twist in structure makes the _____ liquid crystals coloured.
cholesteric

_____ rule is applicable to liquids in which there is no hydrogen bonding.
Trouton's

_____ is the number of moles of solute present in one kilogram of the solvent.
Molality

The solubility of a gas in a liquid is measured in terms of absorption coefficient or _____ coefficient.
Bunsen

The concentration of gases that pollute the atmosphere are expressed in _____
Parts per million

_____ , ideal solutions are those in which volume change is zero.
Thermodynamically

A solution is said to show _____ deviation from Raoult's law, when the vapour pressure of the solution is lower than that of an ideal solution of the same concentration.
negative

According to _____ , the mole fraction of a more volatile component in an ideal solution is more in the vapour phase than in the liquid phase.
Konownloff

Fractional distillation is a _____ process
Continuous

Another name for critical solution temperature is _____ temperature.

Consolute

Differential _____ is employed in the static method of lowering vapour pressure.
Manometer

In _____ , Gibbs deduced a simple relationship among the number of phases in equilibrium.
1876

The volume of gas that liquefies at critical pressure and temperature is the critical volume. True or False?
False

ML2T-2 is the dimensional formula for _____.
Work

Which of this/these representations of force is/are correct?
I 50N
II 50n
III 50 Newton
IV 50 newton.
I,IV

The SI unit factor of 2.5km in M/KM is _____.
1.0000000

Steam bath is employed in which of the separation methods?
crystallisation

Which of the following is false about gases?
They expand indefinitely above certain critical temperature

Which of these have definite volume?
Solids and liquids

Which of the following is false?
Ideals gases do not obey laws exactly for all conditions of temperature and pressure

If a fixed mass of gas is transferred from a 50cm3 container to a 150cm3 container, then its pressure will be
One third

Charles law is not linked with which of the following?
Real gas

One of the following has no contribution to the kinetic theory?
James Bernoulli

Gaseous diffusion method can be used to separate _____.
Isotopes

Considering CO, HCl and NH3 at 400K, which conclusion is true regarding their average kinetic energies?
NH3 = CO = HCl

Gases behave ideally at _____
I Low pressure
II High pressure
III High temperature
IV Low temperature.

I and III

All the following are true of the density of a liquid except _____.
Increases with temperature

One of these is not a refrigerant.
Dichloromethane

Vander waals forces includes the following except _____.
Induced dipole interactions

The under-listed can be linked to dispersion interactions except _____.
Liquefaction of most polar molecules

The effect of attractive and repulsive interactions on the energy of a system can be understood by plotting _____ against _____.
v,r

The basic shape of a unit cell is described by the _____.
Parallel piped

From the relationships among the axis angles and the edge length, there are _____ crystal systems only.
7

The density of crystal depends on _____.
I Mass of atoms
II Structure of atoms
III Number of atoms
IV Volume of the unit cell.
I,III,IV

NaCl is composed of _____ interpenetrating _____ lattices.
Two, fcc

Polonium metal is an example of ___ structure.
Single cubic

Which of the following is not inversely related to temperature?
Conductivity of n-type semi-conductor

Viscosity of liquids depends on the following except _____.
Surface tension

Which of these has the least vapour pressure?
Mercury

Zinc amalgam is a solution of _____
Solid-liquid

The solubility of gas in liquid is directly related to ____.
Pressure

The ratio of the number of moles of a solute to the total number of moles of the solute and the solvent in solution is ____.
Mole fraction

According to Roult's, when a non volatile solute is dissolved in a solvent, the vapor pressure of the solute_____.
None of the options

If x, y, and z are solutions with high vapor, low vapor and atmospheric pressure respectively, if equal amount of heat is supplied to x, y and z, at which order will they boil?
X, z, y

Which of these processes is not found in fractional distillation?
Re-fractionating

Which of these liquid pairs shows both the lower and upper critical solution temperature?
Water and nicotine

A system of totally immiscible liquids has/have how many phase{s}?
Three

Phase equilibria containing ice, water and its vapour is a _____ component system.
One