

PHYSICAL AND COLLOID CHEMISTRY

Vocabulary

Give definitions of each word or phrase:

estimation

dispersed phase

osmotic pressure

endpoint

coagulant

coagulation

sedimentation

colloidal protection

entropy

isotonic quotient

evidence

chemical equilibrium

shelf life

biological catalysts

moistening

thermodynamic function

determination

constant pressure

boiling temperature

eutectic composition

equal molality

peculiarity

surfactant

measurement

threshold

refinement
swelling
intravenous injection
adsorption
adsorbent
mobility
additivity

Task 1. Fill in the missing letters.

1. C_a_u_ant _____
2. Ad_it_vi_y _____
3. S_el_in_ _____
4. T_re_hol_ _____
5. E_i_e_ce _____
6. E_ti_ati_n _____
7. Su_fa_tan_ _____

Task 2. Unscramble the following words.

1. b-o-i-i-l-t-y-m _____
2. t-s-u-r-a-t-c-a-n-f _____
3. n-d-e-m-e-r-i-n-a-t-i-o-t _____
4. p-n-o-i-n-d-t-e _____
5. y-e-c-l-i-a-r-i-t-p-u _____
6. o-d-s-n-r-p-t-i-o-a _____
7. y-e-t-o-p-n-r _____

Task 3. Match the words from column A with ones from column B to make a word combination and write sentences with each combination.

Column A	Column B
1 osmotic	a) pressure
2 chemical	b) protection
3 colloid	c) equilibrium
4 isotonic	d) temperature
5 eutectic	e) coefficient
6 constant	f) composition
7 boiling	g) pressure

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Task 4. Fill in the gaps using the words from the box and translate the sentences.

<i>coagulation</i>	<i>adsorbent</i>	<i>the boiling temperature</i>
<i>swelling entropy</i>	<i>shelf life</i>	<i>surfactant</i>

1. _____ is the process by which blood changes from a liquid to a gel.
2. _____ is the period of time during which medical drugs may be stored.
3. Activated carbon is used as _____ in medicine and pharmacy.
4. The term _____ is a blend of surface active agent.
5. _____ of a solution depends upon the atmospheric pressure.
6. _____ becomes unlimiting under increased temperature.
7. _____ is the direction criterion of the spontaneous process.

Task 5. Read the text.

PHYSICAL AND COLLOID CHEMISTRY

Physical chemistry is the study of macroscopic, atomic, subatomic, and particulate phenomena in chemical systems in terms of the principles, practices, and concepts of physics such as rates, energy, thermodynamics and phase equilibrium, chemical kinetics, surface phenomena.

Physical chemistry, in contrast to chemical physics, is predominantly (but not always) a macroscopic or supra-molecular science, as the majority of the principles on which it was founded relate to the bulk rather than the molecular/atomic structure alone (for example, chemical equilibrium and colloids).

Some of the relationships that physical chemistry strives to resolve include the effects of intermolecular forces that act upon the physical properties of materials (plasticity, tensile strength, surface tension in liquids); reaction kinetics on the rate of a reaction; the identity of ions and the electrical conductivity of materials; surface science and electrochemistry of cell membranes; interaction of one body with another in terms of quantities of heat and work called thermodynamics; transfer of heat between a chemical system and its surroundings during change of phase or chemical reaction taking

place called thermochemistry; study of colligative properties of number of species present in solution; number of phases, number of components and degree of freedom can be correlated with one another with help Gibbs of phase rule; reactions of electrochemical cells.

In chemistry, a colloid is a mixture in which one substance of microscopically dispersed insoluble particles is suspended throughout

another substance. Sometimes the dispersed substance alone is called the colloid; the term colloid suspension refers unambiguously to the overall mixture (although a narrower sense of the word suspension is distinguished from colloids by larger particle size). Unlike a solution, whose solute and solvent constitute only one phase, a colloid has a dispersed phase and a disperse medium. To qualify as a colloid, the mixture must be one that does not settle or would take a very long time appreciably.

The dispersed-phase particles have a size 10^{-7} - 10^{-9} m precipitate. Such particles are normally easily visible in an optical microscope, although at the smaller size range ($r < 250$ nm), an ultramicroscope or an electron microscope may be required. Homogeneous mixtures with a dispersed phase in this size range may be called colloid aerosols, colloid emulsions, colloid foams, colloid dispersions, or hydrosols. The dispersed-phase particles or droplets are affected largely by the surface chemistry present in the colloid.

Some colloids are translucent because of the Tyndall effect, which is the scattering of light by particles in the colloid. Other colloids may be opaque or have a slight color.

Task 6. Answer the questions:

1. What is physical chemistry?
2. What is the difference between physical chemistry and chemical physics?
3. What is the definition of a colloid in chemistry?
4. What does the term colloid suspension refer to?
5. Why are some colloids translucent?

Task 7. Match the words from column A with synonyms from column B.

Column A	Column B
1 motion	a) mass
2 bulk	b) to make efforts
3 to strive	c) movement
4 to resolve	d) named
5 force	e) to determine
6 rate	f) power
7 species	g) blend
8 mixture	h) speed
9 called	i) forms

Task 8. Choose the correct variant:

1. Physical chemistry, in contrast to chemical physics is a macroscopic or supra-molecular science as _____

- a) the majority of the principles on which it was founded relate to the molecular/atomic structure alone.
- b) the majority of the principles on which it was founded relate to the bulk.
- c) the majority of the principles on which it was founded relate to the molecular weight.

2. Some of the relationships that physical chemistry strives to resolve include _____

- a) electrochemistry.
- b) surface science.
- c) surface science and electrochemistry of cell membranes.

3. The term colloid suspension refers to _____

- a) the overall mixture.
- b) the word suspension.
- c) larger particle size.

4. To qualify as a colloid, the mixture must be _____

- a) one that settled or would take a very long time to settle appreciably.
- b) one that does not settle and wouldn't take not a very long time to settle appreciably.
- c) one that does not settle or would take a very long time to settle appreciably.

Task 9. Put the words in the correct order to make up a sentence:

1. the study/ Physical / is / atomic/ subatomic / and / in chemical / systems / of / in terms of / the principles / chemistry / and/ concepts of / physics/ macroscopic/ particulate phenomena/ practices.

2. in contrast to/ chemical /physics/ predominantly/ a macroscopic /or/ /science/ Physical chemistry/ is/ but not always/ supra-molecular.

3. Some of / that /physical /chemistry / to resolve/ include / reaction /kinetics/ on the rate of / the relationships/ strives/ the effects of / a reaction.

4. a colloid / in which / of microscopically/ dispersed / particles/ is / another/ substance/ in chemistry/ is /a mixture/ one substance/ insoluble/ suspended/ throughout.

5. mixtures /with // in / range / may be / colloidal aerosols / colloidal foams / colloidal dispersions / hydrosols / Homogeneous / a dispersed phase/ this size/ called/ colloidal emulsions / or .

PATHOLOGICAL PHYSIOLOGY

Vocabulary

Give definitions of each word or phrase:

acquired

angina pectoris

antibody

ascites

atherosclerotic plaque

aversion to meat food

bile

cardiac output

cellular atypism

complication

congenital

convulsions

cough

exacerbation

flatulence

fracture

hemolytic disease of the

newborns

immature

inflammation

itch

leukemia

mast cells

mature

obesity

recovery

relapse
sickle-cell anemia
tissue atypism
urea
weight loss

Task 1. Fill in the missing letters

1. A _ _ pis _ _____
2. _ laq _ _ _____
3. M _ tu _ e _____
4. _ b _ s _ _ y _____
5. R _ c _ _ _ ry _____
6. _ e _ aps _ _____
7. W _ _ ght _____

Task 2. Unscramble the following words

1. i-b-l-e _____
2. a-i-c-a-r-d-c _____
3. r-a-t-f-u-r-e-c _____
4. t-c-h-i _____
5. m-m-i-r-e-u-t-a _____
6. f-m-i-m-l-i-n-o-t-a-a-n _____
7. o-g-c-h-u _____

Task 3. Match the word from column A with ones from column B to make a word combination and write sentences with each combination.

Column A	Column B
1 atherosclerotic	a) output
2 cardiac	b) atypism
3 sickle-cell	c) disease
4 weight	d) pectoris
5 hemolytic	e) loss
6 angina	f) anemia
7 cellular	g) plaque

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Task 4. Fill in the gaps using the words from the box

<i>urea</i>	<i>convulsions</i>	<i>complication</i>	<i>congenital</i>
<i>exacerbation</i>	<i>antibody</i>	<i>flatulence</i>	

1. Isolated anti-ro _____ could cause complete heart block.
2. The lung inflammation is a _____ of the pancreatic failure, which is reversible.
3. A system to monitor _____ rubella syndrome was set up at that time.
4. We are trying to correct a pretty serious electrolyte imbalance that may cause _____ and exacerbating a cerebral hemorrhage.
5. The primary cause and _____ of this disease has a definite medical explanation.

6. The symptoms associated with stomach bloating due to gas accumulation includes : excessive _____, abdominal discomfort and pain.

7. _____ (also known as carbamide) is a waste product of many living organisms.

Task 5. Read the text

PATHOPHYSIOLOGY

Pathophysiology is a transitive stage between the biological and clinical disciplines. It is closely connected with biology and normal physiology. Pathophysiology is one of the most bridging sciences between preclinical and clinical courses for students in the health sciences. Students learn to recognize and to categorize diseases. The word “pato” is derived from the Greek word pathos, which means “suffering”. The Greek word “logos” means discourse on, more commonly, system of formal study, “physio” pertains to functions of organism.

Pathology is a study of structural alterations in cells, tissues and organs that help to identify the cause of disease. Pathology is the medical discipline that describes conditions typically observed during a disease state. The disease is not a combination of normal processes, it is a new condition of the organism. This is the main difference between pathophysiology and the normal one. Any disorder of a structure or a function of the body may be a disease. Pathology describes the abnormal or undesired condition. Pathology is a study of any disease and pathologist is a physician who specializes in diagnosing and classifying diseases. A clinician is any physician or other health practitioner who cares for patients.

Physiology is the biological discipline that describes processes or mechanisms operating within an organism. Pathophysiology seeks to explain the physiological processes or mechanisms whereby such condition develops and progresses.

Pathophysiology can also mean the functional changes associated with or resulting from disease or injury. Another definition is the functional changes that accompany a particular disease.

Pathophysiology is a required area of study for nearly all healthcare professional school programs (medical, dental, physician assistant, occupational therapy, physical therapy, nurse practitioner, radiation therapists, pharmacy, nursing, radiologic science,

Chiropractic and paramedic programs) in the United States, Canada and other countries.

Task 6. Answer the following questions:

1. What is pathophysiology?
2. What is the difference between pathology, physiology and pathophysiology?
3. What is a disease ?
4. What does pathologist do ?
5. Name healthcare professional school programs that include pathophysiology in their curriculum.

Task 7. Match the words from column A with synonyms from column B

Column A	Column B
1 observed	a) working
2 operating	b) watched
3 condition	c) state
4 pathology	d) trauma
5 injury	e) illness
6 disease	f) abnormal condition
7 required	g) healthcare professional
8 physician	h) necessary

Task 8. Choose the phrase which completes each sentence:

1. The disease _____
 - a) is a combination of abnormal processes.
 - b) it is a new condition of the organism.
 - c) it is a normal condition of the organism.
2. Pathology describes _____
 - a) physiological processes.
 - b) physiological mechanisms.
 - c) not normal conditions.
3. Pathophysiology means the functional changes associated with _____
 - a) operation.

b) sickness.

c) death.

4. Pathophysiology is a required area of study for _____

a) a nurse, a radiation therapist, a dentist.

b) a physician assistant, a physician therapist, a director.

c) a doctor, a dentist, an engineer.

Task 9. Put the words in the correct order to make up a sentence:

1. bringing / clinical / Pathophysiology / is /between / preclinical / science / courses /for / students .

2. Physiology/ that / processes / operating / is/ the biological discipline / or mechanisms/ within an organism / describes.

3. can also/ associated /with resulting /or/ injury/ Pathophysiology / mean / the functional changes/ or/ from disease.

4. Another/ is / a particular /disease definition / the functional changes/ that accompany.

5. is /of study/ for nearly / Pathophysiology / professional school/ a required area /programs/ all healthcare.
