استذلال مراجعة المحاضرة الأولى + الثانية

كيمياء
الانزيمات

2016-2015
أجب عن الأسئلة الآتية:
1- عرف الأنزيمات؟ مستعرضًا خواص الأنزيمات
2- الفيتامينات أو مشتقاتها التي تعمل كقرائن إنزيمية ما هي العلاقة الموجودة بين الفيتامينات وقرآن الأنزيمات؟
3- كيف يمكنك تصنيف الأنزيمات؟
4- لماذا يقصد بالمصطلحات التالية:

1. Enzyme cofactors
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2. Multienzyme Complexes
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   .................................................................................................................................

3. Hydrolase :
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   .................................................................................................................................

إملأ الفراغات التالية

1. Oxidoreductase enzymes include: 1......... 2. ................ 3................
2. Transferase enzymes include: 1............. 2........... 3. ......
3. Hydrolase enzymes include: 1......... 2. ........ 3....... 

5- Choose (A) for true and (B) For false of the following
1. Pepsin acts on peptide bonds between amino groups of aromatic amino acid and carboxylic group of another amino acid (A)
2. Enzymes are usually specific in action (A)
3. In Absolute specificity the enzyme acts at different rates on one type of bond in Compounds chemically related (B)
4. Enzymes may be considered to lower energy barriers for chemical reactions (A)
5. Increase in the substrate concentration will lead to decrease in enzyme activity
6. Increase in enzyme concentration increase the rate of reaction (A)
7. Some enzymes containing SH groups requires Minerals to be activated (B)
8. In Competitive inhibition Vmax of the enzyme is not decreased (A)
9. Inducers are substances which inhibit gene expression (B)
10. Isoenzyme is oligomer enzyme (A)
6-Choose the correct answer of the following:

1. Which statement describes enzymes?
   A. Enzymes are organic molecules.
   B. Enzymes are catalysts.
   C. Enzymes lower activation energy.
   D. Enzymes are proteins.
   E. All of the above describe enzymes.

2. Which of the following acts as a barrier that prevents chemical reactions from occurring rapidly?
   A. Substrate
   B. Metabolic pathway
   C. Competitive inhibitor
   D. Activation energy
   E. Active site

3. This part of an enzyme combines with the substrate.
   A. Allosteric site
   B. Active site
   C. Inhibitor
   D. Metabolic pathway
   E. None of the above

The reaction to the right is an example of a(n) _______ reaction:
   a. Hydrolysis
   b. Oxidation-Reduction
   c. Isomerization
   d. Bond formation using energy of ATP
   e. Group transfer
6. The catalytic activity of enzymes can be lost in case of:
   (a) enzyme is denatured  (b) enzyme is dissociated
   (c) Enzyme is broken down  (d) all

7. enzymes catalyzed transfer of electrons.
   (a) Transferees  (b) Oxidoreductases  (c) Hydrolases  (d) Isomerases

8. Enzymes catalyzed group transfer reactions are called
   (a) Transferases  (b) Oxidoreductases  (c) Hydrolases  (d) Isomerases

9. enzymes catalyzed hydrolysis reactions.
   (a) Transferases  (b) Oxidoreductases  (c) Hydrolases  (d) Isomerizes

10. Enzymes catalyzed transfer of groups within molecules to yield isomeric forms are called
    (a) Transferases  (b) Oxidoreductases  (c) Hydrolases  (d) Isomerases

11. The coenzyme involved in a transaminase reaction is:
    A) biotin phosphate.  B) lipoic acid.
    C) nicotinamide adenine dinucleotide phosphate (NADP+).
    D) pyridoxal phosphate (PLP).
    E) thiamine pyrophosphate (TPP).

12. Enzyme X exhibits maximum activity at pH = 6.9. X shows a fairly sharp decrease in its activity when the pH goes much lower than 6.4. One likely interpretation of this pH activity is that:
    A) a Glu residue on the enzyme is involved in the reaction.
    B) a His residue on the enzyme is involved in the reaction.
    C) the enzyme has a metallic cofactor.
    D) the enzyme is found in gastric secretions
13. Both water and glucose share an —OH that can serve as a substrate for a reaction with the terminal phosphate of ATP catalyzed by hexokinase. Glucose, however, is about a million times more reactive as a substrate than water. The best explanation is that:
   A) Glucose has more —OH groups per molecule than does water.
   B) The larger glucose binds better to the enzyme; it induces a conformational change in hexokinase that brings active-site amino acids into position for catalysis.
   C) The —OH group of water is attached to an inhibitory H atom, while the glucose —OH group is attached to C.
   D) Water and the second substrate, ATP, compete for the active site resulting in a competitive inhibition of the enzyme.
   E) Water normally will not reach the active site because it is hydrophobic.

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   D) pyridoxal phosphate (PLP).        E) thiamine pyrophosphate (TPP).

15. Which of the statements regarding enzymes is false?
   Enzymes are proteins that function as catalysts.
   Enzymes are specific.
   Enzymes provide activation energy for reactions.
   Enzyme activity can be regulated.
   Enzymes may be used many times for a specific reaction.

16. Concerning Isoenzymes
   a- Have quaternary structure and the individual subunits in each isoenzyme are different from the others.
   b- They act on the different substrate and will give the same product.
   c- They have different affinity to the substrate.
   d- They are present in different tissues.

17. Enzyme acts on a special type of bond at specific site and attached to specific groups
   a- Group Specificity            b- Absolute Specificity
   c- Relative Specificity        d- Optical Specificity

18. D-amino acid Oxidase represents
   a- Group Specificity       b- Absolute Specificity
   c- Relative Specificity    d- Optical Specificity
19. Pancreatic Lipase represents
   a- Group Specificity   b- Absolute Specificity
   **c- Relative Specificity**   d- Optical Specificity

20. An enzyme that uses ATP to phosphorylate another molecule is called a
   - Dehydrogenase.
   - Kinase.
   - Phosphorylase.
   - Nucleotidase.

![Chemical Reaction Diagram]

21. The reaction below belongs to the following type of biochemical reaction
   a) Elimination    b) Oxidation and reduction
   c) Reactions that make and brake carbon bonds
   **d) Group-transfer reactions**    e) Additions

22. One of the following can be considered as a coenzyme for transfer of groups other than H except:
   a- Biotin    b- ATP    **c- FAD**    d- Folic acid

23. One of the following is considered a feature of Enzymes except ……
   a- Globular Proteins    b- Undergo Denaturation
   c- Simple Proteins    **d- Non-Specific**

24. Enzyme acts on a special type of bond at specific site and attached to specific groups
   a- Group Specificity    b- Absolute Specificity
   c- Relative Specificity    d- Optical Specificity
2ª. D-amino acid Oxidase represents ……
   a- Group Specificity    b- Absolute Specificity
   c- Relative Specificity  d- Optical Specificity

2ª. Pancreatic Lipase represents ……
   a- Group Specificity    b- Absolute Specificity
   c- Relative Specificity  d- Optical Specificity

2º. Pepsin is activated through ……..
   a- Removal of inhibitory peptide  b- Reducing agent
   c- Minerals  d- Allosteric activators

28. All of the following are included in Transferase class of enzymes except …….
   a- Transaminase  b- Hydrolase
   c- Transglycosayl  d- None of the above

29. Carboxylase is an example of ……..
   a- Transferase  b- Estrases  c- Oxidases  d- Ligases

30. An enzyme that uses NADH to reduce another molecule is called a

31. Inactive precursors of some enzymes that are activated through hydrolysis reactions
   are called:
   a) Allosteric enzymes  b) Apo enzymes  c) holloenzymes
   d) Prosthetic groups  e) Zymogens

32. You are given a list of E.C. numbers by your independent study supervisor, but from
   looking at it you feel that one of the enzymes does not exist. Which one?
   a) 3.4.2.1  b) 4.4.5.6  c) 1.1.1.1  d) 8.3.2.4  e) 5.17.4.3

33. What classes of reactions do Lyases catalyze?
   a) Bond formation coupled with ATP hydrolysis  b) Isomerizations
   c) Group elimination to form double bonds  d) Transfer of functional groups

34. Enzymes which catalyze transfer of functional groups (G) other than hydrogen
   between a pair of substrates
35. All of the following are included in Transferase class of enzymes except
   a- Transaminase       b- Hydrolase       c- Transglycosyl      d- None of the above

36. Enzymes which catalyze transfer of functional groups (G) other than hydrogen between a pair of substrates
   a- Transferase       b- Oxygenases        c- Dehydrogenases       d- Hydrolases

37. Enzymes link two molecules using energy from ATP
   a- Lyases       b- Hydrolase       c- Ligase       d- Redox

38. Carboxylase is an example of
   a- Transferees        b- Estruses        c- Oxidases          d- Ligases

39. Enzymes utilizing H2O2 as substrate
   a- Oxidases        b- Peroxidases        c- Dehydrogenases       d- Oxygenases

40. A certain enzyme will hydrolyze egg white but not starch. Which statement best explains this observation?
   (A) Starch molecules are too large to be hydrolyzed
   (B) Enzyme molecules are specific in their actions
   (C) Egg white acts as a coenzyme for hydrolysis
   (D) Starch is composed of amino acids.

41. Which of the following enzymes would digest a fat?
   (A) Sucrose       (B) Protease       (C) Ligase       (D) Lipase

42. Isoenzymes are:
   a. product of closely related gene.
   b. physically separate forms of same catalytic activity.
   c. present in different organelle of same cell.
   d. different tissues produce same protomers of isoenzyme.
Methanol (wood alcohol) is highly toxic because it is converted to formaldehyde in a reaction catalyzed by the enzyme alcohol dehydrogenase:

\[ \text{NAD}^+ + \text{methanol} \rightarrow \text{NADH} + \text{H}^+ + \text{formaldehyde} \]

Part of the medical treatment for methanol poisoning is to administer ethanol (ethyl alcohol) in amounts large enough to cause intoxication under normal circumstances. Explain this in terms of what you know about examples of enzymatic reactions.

**Ans:** Ethanol is a structural analog of methanol, and competes with methanol for the binding site of alcohol dehydrogenase, slowing the conversion of methanol to formaldehyde, and allowing its clearance by the kidneys. The effect of ethanol is that of a competitive inhibitor.

\[ \text{Ethanol (wood alcohol)} \rightarrow \text{a competitive inhibitor} \]

[Diagram of enzymatic reaction]

استنتاج من المعادلة التالية:

- اسم الإنزيم الذي يحفز هذا التفاعل: succinate Dehydrogenase
- عدد نوع التفاعل: تفاعل اكسلة واختزال
- رقم بتصنيف هذا الإنزيم: 1