

PREVIOUS QUESTIONS AND ANSWERS

CHEMISTRY (313)

Question number 1 to 5 carry one mark

1. Give example for a biodegradable polymer.
Answer: P H B V (NIOS 2016)
2. When is species act as a acid as well as a base what is it called.
(NIOS 2006)
Answer:
Amphoteric species
3. How is heavy water separated from ordinary water. (NIOS 2009)
Answer: by electrolysis
4. Which gas is evolved when PbO_2 is heated with concentrated HNO_3 .
(NIOS 2016)
Answer: O_2
5. Write the electronic configuration of copper atom. (NIOS 2002)
Answer: $[Ar] 4s^1 3d^{10}$

Questions 6 to 10 carry 2 marks

6. Transition metals and their ions show paramagnetic behaviour. Give reason.
(NIOS 2005)
Answer: transition elements and their ions show paramagnetic behaviour is due to the presence of unpaired electrons in the atom or the ion.
7. What are polydentate ligands ts why are they called chelating agents. (NIOS 2016)
Answer: Poly dentate ligands have more than two donor atom present in them. They are called chelating agents because of their ability to hold the metal atom like a claw.
Eg: EDTA
8. Mention four properties of ionic compound . (NIOS 2016)
Answer .
 - A. Most of them are solids
 - B. Most of them are soluble in water
 - C. Most of them have high melting point and a boiling point
 - D. They conduct electricity
9. What are Sigma and Pi bonds (NIOS 2009& 2015)

Answer

Sigma bond is a bond formed by the end to end overlapping of two orbitals along the inter nuclear Axis. pi bond is formed by the sideways or lateral overlapping of to PP orbitals.

10. Why is the boiling point of a solution always higher than that of a pure solvent. (NIOS 2007)

Answer

On dissolving non volatile solute in pure solvent to obtain a solution the vapour pressure of solvent decreases the for this solution will require higher temperature to boil this is why the boiling point of a solution is always higher than that of a pure solvent.

Question 11 to 13 carry 3 marks

11. A 10% urea solution is isotonic with 20% solution of X at the same temperature calculate molecular mass of X. (NIOS 2004)

Answer.

Molar concentration of 10 percentage urea solution

$$= \frac{10 \times 1000}{100 \times 60}$$

$$= \frac{10}{6} \text{ mol L}^{-1}$$

Molar concentration of 20% solution of X

$$= \frac{20 \times 1000}{100 \times M}$$

$$= \frac{20}{M} \text{ Mol L}^{-1}$$

For isotonic solutions molar concentrations are equal

$$\frac{10}{6} = \frac{200}{M}$$

$$M = 120$$

12. Define buffer solution state its two applications in our body fluids. (NIOS 2016)

Answer

Buffer solution are those solutions which resist a change in pH on adding a small amount of an acid or a base.

Applications

1. The oxygen carrying capacity of hemoglobin in our body depends on pH which is maintain very close to 7.4
2. pH of saliva is closed to 6.8

13. Plane diagonal relationship. (NIOS 2004)

Answer

In second and third period of the periodic table first element of a group often shows resemblance with to the second element of the next group on the its right it is due to similar charge by radius ratio similar polarizing power this type of behaviour is termed as diagonal relationship

Lithium shows diagonal relationship with magnesium beryllium shows diagonal relationship with aluminium and boron shows diagonal relationship with silicon

Questions 14 and 15 carry 5 marksJ

14. Why water soluble vitamins must be supplied regularly in the diet give one example of it.

Differentiate between the following

- A. Essential and non essential amino acid
- B. Fibres and globular proteins (model 2023)

Answer

Water soluble vitamins must be supplied regularly in the diet because they are regularly excreted in urine and cannot be stored in our body for example vitamin C and vitamin B . (1)

Non essential amino acids are which our body can synthesise . They may or may not be present in a in the diet.

Eg. Glycine , alanine

Essential amino acids which are not in the sized in our body and they must be supplied through diet.

(2)

Globular proteins have almost spherical shape due to the folding of polypeptide chains and are soluble in water they are sensitive to small changes of temperature and pH they possess biological activity that's why they act as in science

Eg. Insulin

Fibrous proteins polypeptide chains or thread like structure fibrous proteins are insoluble in water they have stable to moderating changes of temperature and pH they do not have any biological activity but serve as chief structural material of animal tissue

Eg. Keratin.(2)

15. A. Which type of bonding is responsible for higher boiling point of carboxylic acids
- B. Chloro ethanoic acid is a is stronger than ethanoic acid why
- C. Arrange the following acids in the order of their increasing solubility in water why
C₃H₇COOH, CH₃COOH, C₆H₅COOH
- D. Tolens reagent cannot be used to oxidize an alcohol why
(NIOS 2003)

Answer

- A. Intermolecular hydrogen bonding between carboxylic acid molecules is responsible for higher boiling point of carboxylic acid acetic acid forms dimer due to hydrogen bonding. (1)
- B. Chlorine atom has electron withdrawing effect with the turn decrease the negative charge over the carboxylate ion and stabilize it does loss of proton becomes relatively easily in chloro ethanoic acid. (1)
- C. C₆H₅COOH < C₃H₇COOH < CH₃COOH
Less molecular weight more soluble in water. (2)
- D. Tollentz reagent is a weak oxidising agents and cities unable to oxides and alcoholic group. (1)