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Previous Year Paper

Chemistry - 2003

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Multiple Choice Questions

1. The standard adopted for the determination of atomic weight of elements is based on :

- A. H^1
- B. C^{12}
- C. O^{16}
- D. S^{32}

Answer

2. Law of multiple proportions is illustrated by one of the following pairs :

- A. N_2O and NO
- B. H_2S and SO_2
- C. NH_3 and Na_2O
- D. BeO and $BeCl_2$

Answer

3. Paramagnetism of oxygen is explained on the basis of its electronic configuration of

- A. $(\pi^*2p_x)^1(\pi 2p_y)^1$
- B. $(\pi^*2p_y)^1(\pi^*2p_z)^1$
- C. $(\sigma^*2s)^1(\pi 2p_y)^1$
- D. $(\sigma^*2s)^1(\pi 2p_y)^1$

Answer

4. The van der Waals' equation for a real gas is given by the formula $P + \frac{n^2a}{V^2} (V - nb) = nRT$ where, P, V, T and n are the pressure, volume, temperature and the number of moles of the gas.

Which one is the correct interpretation for the parameter a?

- A. The parameter a accounts for the finite size of the molecule, not included temperature in the ideal gas law
- B. The parameter a accounts for the shape of gas phase molecules
- C. The parameter a accounts for intermolecular interaction's present in the molecule
- D. The parameter a has no physical significance and van der Waals' introduced it as a numerical correction factor only

Answer

5. Avogadro's hypothesis states that :

- A. the ideal gas consists of a large number of small particles called molecules

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contain the same number of molecules

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C. Volume of a definite quantity of gas at constant pressure is directly proportional to

absolute temperature

D. a given mass of gas at constant pressure is directly proportional to absolute temperature

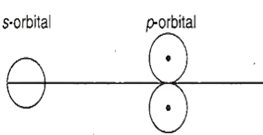
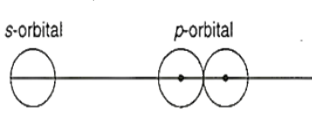
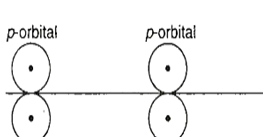
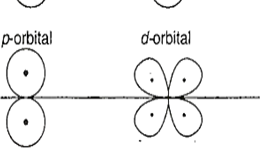
Answer

6. The observation that the ground state of nitrogen atom has 3 unpaired electrons in its electronic configuration and not otherwise is associated with:

- A. Pauli's exclusion principle
- B. Hund's rule of maximum multiplicity
- C. Heisenberg's uncertainty relation
- D. Ritz combination principle

Answer

7. Which of the following overlaps leads to bonding?

- A. 
- B. 
- C. 
- D. 

Answer

8. In the periodic table metallic character of elements shows one of the following trend :

- A. decreases down the group and increases across the period
- B. increases down the group and decreases across the period
- C. increases across the period and also down the group
- D. decreases across the period and also down the group

Answer

9. Which of the following statements is correct ?

- A. All carbon to carbon bonds contain a σ -bond and one or more π -bonds
- B. All carbon to hydrogen bonds are π -bonds
- C. All oxygen to hydrogen bonds are hydrogen bonds
- D. All carbon to hydrogen bonds are π -bonds

Answer

10. An example of a polar covalent compound is _____

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B. NaCl

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D. HCl

Answer

11. If 117 gm NaCl is dissolved in 1000 g of water the concentration of the solution is said to be :

- A. 2 molar
- B. 2 molal
- C. 1 normal
- D. 1 molal

Answer

12. A solution of 4.5 g of a pure non-electrolyte in 100 g of water was found to freeze at 0.465°C . The molecular weight of the solute is closest to ($k_f = 1.86$)

- A. 180.0
- B. 135.0
- C. 172.0
- D. 90.0

Answer

13. The enthalpy of vaporization of substance is 840 J mol^{-1} and its boiling point is -173°C . Its entropy of vaporization is :

- A. $42 \text{ J mol}^{-1} \text{ K}^{-1}$
- B. $21 \text{ J mol}^{-1} \text{ K}^{-1}$
- C. $84 \text{ J mol}^{-1} \text{ K}^{-1}$
- D. $8.4 \text{ J mol}^{-1} \text{ K}^{-1}$

Answer

14. Given the following thermochemical equations:



Accordingly the heat of reaction for the following reaction, $\text{Zn} + \text{HgO} \rightarrow \text{Hg} + \text{heat}$ is:

- A. 105,700 cal
- B. 61,000 cal
- C. 62,300 cal
- D. 60,000 cal

Answer

15. A saturated solution of CaF_2 is $2 \times 10^{-4} \text{ mol/L}$. Its solubility product constant is:

- A. 2.6×10^{-9}

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D. 3.2×10^{-11}

Answer

16. For the reaction,



the equilibrium constants expressed in terms of concentrations K_c and in terms of partial pressures K_p , are related as:

A. $K_p = K_c (RT)^2$

B. $K_p = K_c (RT)^{-2}$

C. $K_p = K_c$

D. $K_c = K_p (RT)$

Answer

17. Radioactive decay series of Uranium is denoted as:

A. $4n + 1$

B. $4n + 2$

C. $4n$

D. $4n + 3$

Answer

18. Which of the following pairs are correctly matched?

1. Haber process	Manufacture of ammonia
2. Leblanc process	Manufacture of sulphuric acid
3. Birkeland-Eyde process	Manufacture of nitric acid
4. Solvay process	Manufacture of sodium carbonate

Select the correct answer using the codes given below-

A. 1, 3 and 4

B. 2, 3 and 4

C. 1, 2, 3 and 4

D. 1, 2 and 4

Answer

19. Identify the incorrect statement :

A. The molarity of a solution is independent of temperature

B. The tendency for catenation is much higher for carbon than for silicon

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D. *t*-butyl 1-carbocation has planar carbons and is very reactive

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Answer

20. In one of the following reactions HNO_3 does not behave as an oxidizing agent. Identify it :

- A. $2\text{HNO}_3 + \text{P}_2\text{O}_5 \rightarrow 2\text{HPO}_3 + \text{N}_2\text{O}_5$
- B. $\text{I}_2 + 10 \text{HNO}_3 \rightarrow 2\text{HIO}_3 + 10 \text{NO}_2 + 4\text{H}_2\text{O}$
- C. $3\text{Cu} + 8\text{HNO}_3 \rightarrow 3\text{Cu}(\text{NO}_3)_2 + 2\text{NO} + 4\text{H}_2\text{O}$
- D. $\text{NO}_3 + 3\text{Fe}^{2+} + 4\text{H}^+ \rightarrow \text{NO} + 3\text{Fe}^{3+} + 2\text{H}_2\text{O}$

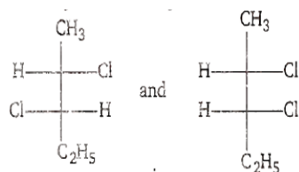
Answer

21. The number of isomeric hexanes is:

- A. 5
- B. 2
- C. 3
- D. 4

Answer

22. The two optical isomers given below, namely are:



- A. enantiomers
- B. geometrical isomers
- C. diastereomers
- D. structural isomers

Answer

23. Which of the following statement is wrong ?

- A. Using Lassaigne's test nitrogen and sulphur present in organic compound can be tested
- B. Using Beilstein's test the presence of halogen in a compound can be tested.
- C. In Lassaigne's filtrate the nitrogen present in a organic compound is converted into NaCN
- D. In the estimation of carbon, an organic compound is heated with CaO in a combustion tube

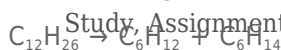
Answer

24. *Cis-trans* isomers generally :

- A. contain an asymmetric carbon atom
- B. contain double bonded carbon atoms
- C. rotate the plane of polarized light
- D. are enantiomorphs

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25. The following reaction represent,



- A. substitution
- B. synthesis
- C. cracking
- D. polymerization

Answer

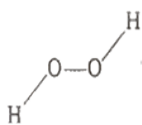
26. Hydrogen peroxide when added to a solution of potassium permanganate acidified with sulphuric acid:

- A. forms water only
- B. acts as an oxidizing agent
- C. acts as a reducing agent
- D. produces hydrogen

Answer

27. The equilibrium molecular structure of hydrogen peroxide is :

- A. Planar as given below



- B. linear
- C. tetrahedral
- D. non-planar

Answer

28. Alkali metals have high oxidation potential and hence, they behave as :

- A. oxidizing agents
- B. Lewis bases
- C. reducing agents
- D. electrolytes

Answer

29. Which of the following 1 : 1 mixture will act as buffer solution ?

- A. HCl and NaOH
- B. CH_3COOH and CH_3COONa
- C. KOH and CH_3COOH
- D. CH_3COOH and NaCl

Answer

30. What is potential of platinum wire dipped into a solution of 0.1 M in Sn^{2+} and 0.01 M in Sn^{4+} ?

- A. E°

B. $E^\circ + 0.059$

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D. $E^\circ = 0.059$

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31. Which of the following statement is not correct?

- A. In zero order reaction the rate of the reaction remains constant throughout
- B. A second order reaction would become a pseudo first order reaction when one of the reactants is taken in large excess
- C. The value of first order rate constant depends on the units of the concentration terms used
- D. In a first order reaction the plot of $\log(a - x)$ vs time gives a straight line

Answer

32. The coagulating power of an electrolyte for arsenious sulphide decreases in the order :

- A. $\text{Na}^+ > \text{Al}^{3+} > \text{Ba}^{2+}$
- B. $\text{PO}_4^{3-} > \text{SO}_4^{2-} > \text{Cl}^-$
- C. $\text{Cl}^- > \text{SO}_4^{2-} > \text{PO}_4^{3-}$
- D. $\text{Al}^{3+} > \text{Ba}^{2+} > \text{Na}^+$

Answer

33. A certain metal will liberate hydrogen from dilute acids. It will react with water to form hydrogen only when the metal is heated and the water is in the form of steam. The metal is probably:

- A. iron
- B. potassium
- C. copper
- D. mercury

Answer

34. The number of α and β particles emitted in the chain of reactions leading to the decay of $^{92}_{238}\text{U}$ to $^{82}_{206}\text{Pb}$:

- A. 8 β particles and 6 α particles
- B. 5 α particles and 0 β particles
- C. 8 α and 6 β particles
- D. 10 α particles and 10 β particles

Answer

35. Water is oxidized to oxygen by :

- A. ClO_2
- B. KMnO_4
- C. H_2O_2
- D. Fluorine

Answer

36. The magnetic moment μ , of transition metals is related to the number of unpaired electrons, n . Like. Share. Bookmark. Download. Make Notes. Print - Your Favourite Questions. Join www.zigya.com

A. $\mu = n n + 2$

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B. $\mu = n (n + 2)^2$

C. $\mu = n^2 (n + 2)$

D. $\mu = n / (n + 2)$

Answer

37. Wurtz's reaction involves the reduction of alkyl halide with :

- A. Zn/ HCl
- B. HI
- C. Zn/ Cu couple
- D. Na in ether

Answer

38. The compound that does not answer iodoform test is :

- A. ethanol
- B. ethanal
- C. methanol
- D. propanone

Answer

39. Which one of the following compound reacts with chlorobenzene to produce DDT ?

- A. Acetaldehyde
- B. Nitrobenzene
- C. *m*-chloroacetaldehyde
- D. Trichloroacetaldehyde

Answer

40. Conversion of benzaldehyde to 3-phenylprop-2-en-1-oic acid is:

- A. Perkin condensation
- B. Claisen condensation
- C. oxidative addition
- D. Aldol condensation

Answer

41. Which of the following compounds forms an addition compound with CH_3MgBr_2 which on hydrolysis produce a secondary alcohol ?

- A. HCHO
- B. CH_3CHO
- C. CH_3OCH_3
- D. CH_3COCH_3

Answer

42. Which of the following compounds on treatment first with NaNO_2/HCl and then coupled with

phenol produces *p*-hydroxyazobenzene ?
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B. Aniline

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D. Phenol

Answer

43. Initial setting of cement is mainly due to :

- A. hydration and gel formation
- B. dehydration and gel formation
- C. hydration and hydrolysis
- D. dehydration and dehydrolysis

Answer

44. Consider the following compounds :

1. Sulphur dioxide
2. Hydrogen peroxide
3. Ozone

Among these compounds identify those that can act as bleaching agent :

- A. 1 and 3
- B. 2 and 3
- C. 1 and 2
- D. 1, 2 and 3

Answer

45. Which one of the following statement is wrong?

- A. The IUPAC name of $[\text{Co}(\text{NH}_3)_6\text{Cl}_3]$ is hexamine cobalt (III) chloride
- B. Dibenzol peroxide is a catalyst in the polymerization of PVC
- C. Borosilicate glass is heat resistant
- D. Concentrated HNO_3 can be safely transported in aluminium containers

Answer

46. Which of the following is not a thermoplastic?

- A. Polystyrene
- B. Teflon
- C. Novalac
- D. Polyvinyl chloride

Answer

47. Which set is the correct pairing set (or contains complementary pairs) responsible for the structure of DNA ? (A-adenine, G-guanine, C-cytosine, T-thymine, U-uracil)

- A. A-T, G-C
- B. A-C, G-T
- C. A-G, C-T
- D. A-U, G-C

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48. Barbituric acid and its derivatives are well known as:

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A. tranquilizers

B. antiseptics

C. analgesics

D. antipyretics

Answer