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Previous Year Paper

Chemistry - 2010



Multiple Choice Questions

1. Enthalpy of a compound is equal to its

- A. heat of combustion
- B. heat of formation
- C. heat of reaction
- D. heat of solution

Answer

2. For which one of the following reactions will there be a positive ΔS ?

- A. $\text{H}_2\text{O}(\text{g}) \rightarrow \text{H}_2\text{O}(\text{l})$
- B. $\text{H}_2 + \text{I}_2 \rightarrow 2\text{HI}$
- C. $\text{CaCO}_3(\text{s}) \rightarrow \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$
- D. $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$

Answer

3. A radioactive element X emits 3α , 1β and 1γ -particles and forms ${}_{76}^{235}\text{Y}$. Element X is

- A. ${}_{81}^{247}\text{X}$
- B. ${}_{80}^{247}\text{X}$
- C. ${}_{81}^{246}\text{X}$
- D. ${}_{80}^{246}\text{X}$

Answer

4. For the reaction,

$2\text{A}(\text{g}) + \text{B}_2(\text{g}) \rightleftharpoons 2\text{AB}_2(\text{g})$ the equilibrium constant, K_p at 300K is 16.0. The value of K_p for $\text{AB}_2(\text{g}) \rightleftharpoons \text{A}(\text{g}) + 1/2\text{B}_2(\text{g})$ is

- A. 8
- B. 0.25
- C. 0.125
- D. 32

Answer

5. The standard Gibb's free energy change, ΔG° is related to equilibrium constant, K_p as

- A. $K_p = -RT \ln \Delta G^\circ$
- B. $K_p = e^{RT \Delta G^\circ}$
- C. $K_p = -\Delta G^\circ / RT$

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[Answer](#)

6. The yield of the product in the reaction

$A_2(g) + 2B(g) \rightleftharpoons C(g) + Q \text{ kJ}$ would be higher at

- A. high temperature and high pressure
- B. high temperature and low pressure
- C. low temperature and high pressure
- D. low temperature and low pressure

[Answer](#)

7. In which of the following case, does the reaction go farthest to completion?

- A. $K = 10^2$
- B. $K = 10$
- C. $K = 10^{-2}$
- D. $K = 1$

[Answer](#)

8. The radius of Na^+ is 95 pm and that of Cl^- ion is 181 pm. Hence, the coordination number of Na^+ will be

- A. 4
- B. 6
- C. 8
- D. unpredictable

[Answer](#)

9. Mg is an important component of which biomolecule occurring extensively in living world?

- A. Haemoglobin
- B. Chlorophyll
- C. Florigen
- D. ATP

[Answer](#)

10. The correct formula of the complex tetraammineaquachlorocobalt (III) chloride is

- A. $[\text{Cl}(\text{H}_2\text{O})(\text{NH}_3)_4\text{Co}]\text{Cl}$
- B. $[\text{CoCl}(\text{H}_2\text{O})(\text{NH}_3)_4]\text{Cl}$
- C. $[\text{Co}(\text{NH}_3)_4(\text{H}_2\text{O})\text{Cl}]\text{Cl}$
- D. $[\text{CoCl}(\text{H}_2\text{O})(\text{NH}_3)_4]\text{Cl}_2$

[Answer](#)

11. The equivalent conductance at infinite dilution of a weak acid such as HF

- A. can be determined by extrapolation of measurements on dilute solutions of HCl, HBr and HI

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D. is an undefined quantity

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12. For a reaction of type $A + B \rightarrow \text{products}$, it is observed that doubling concentration of A causes the reaction rate to be four times as great, but doubling amount of B does not affect the rate. The unit of rate constant is

- A. s^{-1}
- B. $s^{-1} \text{ mol L}^{-1}$
- C. $s^{-1} \text{ mol}^{-1} \text{ L}$
- D. $s^{-1} \text{ mol}^{-2} \text{ L}^{-2}$

Answer

13. A chemical reaction was carried out at 320 K and 300 K. The rate constants were found to be k_1 and k_2 respectively. Then

- A. $k_2 = 4k_1$
- B. $k_2 = 2k_1$
- C. $k_2 = 0.25 k_1$
- D. $k_2 = 0.5k_1$

Answer

14. Across the lanthanide series, the basicity of the lanthanide hydroxides

- A. increases
- B. decreases
- C. first increases and then decreases
- D. first decreases and then increases

Answer

15. Frenkel defect is generally observed in

- A. AgBr
- B. AgI
- C. ZnS
- D. All of the above

Answer

16. Most crystals show good cleavage because their atoms, ions or molecules are

- A. weakly bonded together
- B. strongly bonded together
- C. spherically symmetrical
- D. arranged in planes

Answer

17. $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{NO}_2$ and $[\text{Co}(\text{NH}_3)_4\text{Cl}]\text{Cl}[\text{NO}_2]$ exhibit which type of isomerism?

A. Geometrical

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C. Linkage

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D. Ionisation

Answer

1. Which of the following compounds is not coloured?

- A. $\text{Na}_2[\text{Cu}(\text{Cl})_4]$
- B. $\text{Na}[\text{Cd}(\text{Cl})_4]$
- C. $\text{K}_4[\text{Fe}(\text{CN})_6]$
- D. $\text{K}_3[\text{Fe}(\text{CN})_6]$

Answer

19. Coordination number of Ni in $[\text{Ni}(\text{C}_2\text{O}_4)_3]^{4-}$ is

- A. 3
- B. 6
- C. 4
- D. 5

Answer

20. Sterling silver is

- A. AgNO_3
- B. Ag_2S
- C. Alloy of 80% Ag+ 20% Cu
- D. AgCl

Answer

21. Identify the statement which is not correct regarding CuSO_4

- A. It react with KI to give iodine
- B. It react with KCl to give Cu_2Cl_2
- C. It react with NaOH and glucose to give Cu_2O .
- D. It gives CuO on strongly heating in air.

Answer

22. Transition metals usually exhibit highest oxidation states in their

- A. chlorides
- B. fluorides
- C. bromides
- D. iodides

Answer

23. The number of Faradays needed to reduce 4 g equivalents of Cu^{2+} to Cu metal will be

- A. 1
- B. 2

[Answer](#)

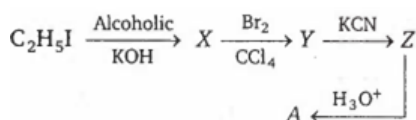
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24. Which one of the following cells can convert chemical energy of H_2 and O_2 directly into electrical energy?

A. Mercury cell
B. Daniell cell
C. Fuel cell
D. Lead storage cell

[Answer](#)

25. The activity of an old piece of wood is just 25% of the fresh piece of wood. If $t_{1/2}$ of C-14 is 6000 yr, the age of piece of wood is
- A. 6000 yr
B. 3000 yr
C. 9000 yr
D. 12000 yr

[Answer](#)

The product 'A' is

A. succinic acid
B. melonic acid
C. oxalic acid
D. maleic acid

[Answer](#)

27. The formula of ethyl carbinol is
- A. CH_3OH
B. CH_3CH_2OH
C. $CH_3CH_2CH_2OH$
D. $(CH_3)_3COH$

[Answer](#)

28. Which of the following gives red colour in Victor Meyer's test?
- A. n-propyl alcohol
B. Isopropyl alcohol
C. tert-butyl alcohol
D. sec-butyl alcohol

[Answer](#)

29. When p-nitrobromobenzene reacts with sodium ethoxide, the product obtained is

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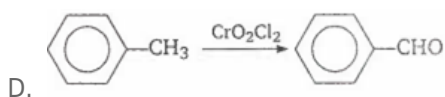
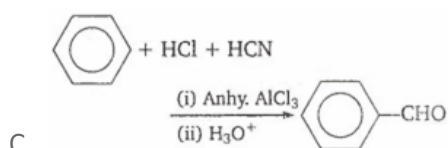
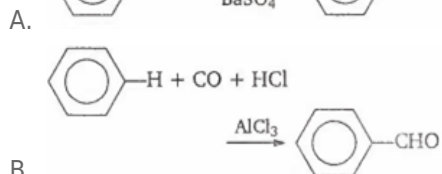
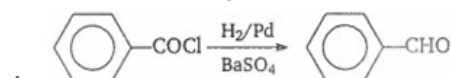
C. *p*-nitrophenetole

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D. no reaction occurs

Answer

30. Which of the following is a Gattermann aldehyde synthesis?



Answer

31. Aldol is

- A. β -hydroxybutyraldehyde
- B. α -hydroxybutanal
- C. β -hydroxypropanal
- D. None of the above

Answer

32. Nitrobenzene can be converted into azobenzene by reduction with

- A. Zn, NH₄Cl, Δ
- B. Zn/NaOH, CH₃OH
- C. Zn/NaOH
- D. LiAlH₄, ether

Answer

33. The one which is least basic is

- A. NH₃
- B. C₆H₅NH₂
- C. (C₆H₅)₃N
- D. (C₆H₅)₂NH

Answer

34. On treatment of propanone with dilute Ba(OH)₂ the product formed

- A. aldol
- B. phorone
- C. propionaldehyde
- D. 4-hydroxy-4-methyl-2-pentanone

35. Which of the following converts CH_3CONH_2 to CH_3NH_2 ?

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A. NaBr

B. NaOBr

C. Br_2

D. None of the above

Answer

36. Which metal aprons are worn by radiographer to protect him from radiation?

A. Mercury coated apron

B. Lead apron

C. Copper apron

D. Aluminimised apron

Answer

37. Formation of cyanohydrin from a ketone is an example of

A. electrophilic addition

B. nucleophilic addition

C. nucleophilic substitution

D. electrophilic substitution

Answer

38. Glycerol on treatment with oxalic acid at 110°C forms

A. formic acid

B. allyl alcohol

C. CO_2 and CO

D. acrolein

Answer

39. The reaction, $\text{ROH} + \text{H}_2\text{CN}_2$ in the presence of HBF_4 , gives the following product

A. ROCH_3

B. RCH_2OH

C. ROHCN_2N_2

D. RCH_2CH_3

Answer

40. The fatty acid which shows reducing property is

A. acetic acid

B. ethanoic acid

C. oxalic acid

D. formic acid

Answer