

QUARTERLY EXAMINATION - 2023

CLASS : XII

CHEMISTRY

Register
No

MAX. MARKS : 70

TIME : 3.00 Hr.

PART - I

15 X 1 = 15

I) Choose the Correct Answer.

- Considering Ellingham diagram, which of the following metals can be used to reduce alumina?
a) Fe b) Cu c) Mg d) Zn
- Match the items in column - I with the items of column- II and assign the correct code

Column - I	Column- II	A	B	C	D
A) Cyanide process	1. Ultrapure Ge	(a) 2	3	1	4
B) Froth floatation process-	2. Dressing of Zns	(b) 4	2	1	3
C) Electrolytic reduction-	3. Extraction of Au	(c) 1	2	3	4
D) Zone refining	4. Extraction of Al	(d) 3	4	1	2
- The geometry at which Carbon atom in diamond are bonded to each other is
a) Teterahedral b) hexagonal c) Octahedral d) none of these
- The formula for Hyponitrous acid is
a) HOONO b) HNO₂ c) H₂N₂O₂ d) HNO₄
- The most common oxidation state of actinoids is
a) +2 b) +3 c) +4 d) +6
- Assertion : due to Frenkel defect, density of the crystalline solid decreases
Reason : In Frenkel defect cation and anion leaves the crystal.
a) Both assertion and reason are true and reason is correct explanation of assertion
b) Both assertion and reason are true but reason is not the correct explanation of assertion
c) Assertion is true but reason is false d) Both assertion and reason are false
- The crystal with a metal deficiency defect is
a) NaCl b) FeO c) ZnO d) KCl
- If 75% of a first order reaction was completed in 40 minutes, 50 % of the same reaction under the same conditions would be completed in
a) 20 minutes b) 30 minutes c) 35 minutes d) 75 minutes
- The addition of a catalyst during a chemical reaction alters which of the following quantities?
a) Enthalpy b) Activation energy c) Internal energy d) Entropy
- The P^H of an aqueous solution is Zero the solution is
a) neutral b) slightly acidic c) Strongly acidic d) basic
- If the solubility product of Lead iodide is 3.2 X 10⁻⁸, its solubility will be
a) 2X10⁻³ M b) 4 X 10⁻⁴ M c) 1.6 X 10⁻⁵ M d) 1.8 X 10⁻⁵ M
- In Victor mayer test the secondary alcohol gives the colour is
a) Red b) Yellow c) Green d) Blue
- Which of the following compound can be used as antifreeze in automobile radiators?
a) Ethylene glycol b) Methanol c) Ethanol d) Phenol
- Which one of the following reaction is an example of disproportionation reaction?
a) Aldol condensation b) Cannizaro reaction
c) Benzoin Condensation d) None of these
- Which one of the following reduces tollens reagent
a) Formic acid b) Acetic acid c) Benzophenone d) None of these

PART - II

II) Answer any 6 Questions (Q.No.24 is Compulsory)

6X2=12

16. Which type of ores can be concentrated by froth floatation method? Give two example for such ores.
17. Write the anomalous Property of the first element of 'P' - block.
18. Why fluorine is more reactive than other halogens?
19. Define packing efficiency of crystals.
20. What is half life of a reaction ?
21. Identify the conjugate acid - base pair of the following reaction
 (i) $\text{HS}^-_{(\text{aq})} + \text{HF} \rightleftharpoons \text{F}^-_{(\text{aq})} + \text{H}_2\text{S}_{(\text{aq})}$ (ii) $\text{HPO}_4^{2-} + \text{SO}_3^{2-} \rightleftharpoons \text{PO}_4^{3-} + \text{HSO}_3^-$
22. Give short note on Dows Process.
23. What is Urotrophine? Write the uses of urotrophine.
24. Which is more stable Fe^{3+} (or) Fe^{2+} ? Explain.

PART - III

III) Answer any 6 Questions (Q.No.33 is Compulsory)

6X3=18

25. What are the difference between minerals and Ore.
26. Write the uses of Helium.
27. Complete the equations. (i) $\text{HCOOH} + \text{H}_2\text{SO}_4 \longrightarrow ?$ (ii) $\text{H}_2\text{B}_4\text{O}_7 \xrightarrow{\text{red hot}} ?$
28. Why transition elements forms complex compounds?
29. Write the difference between metal excess defect and metal deficiency defect.
30. Define rate law and rate constant.
31. Write the Rosenmund reduction reaction?
32. Write the dehydrating reaction of Glycerol
33. Write the expression for the solubility product of $\text{Ca}_3(\text{PO}_4)_2$.

PART - IV

IV) Answer all the questions :

5X5=25

34. a) Explain Froth floatation method with diagram. (5)
 (OR)
 b) i) Write the Oxidation state of halogens for the following compounds. 1) OF_2 2) I_2O_4 (2)
 ii) Write the short note on bleaching action of chlorine. (3)
35. a) i) Explain Structure of diborane. (3)
 ii) Write a short note on Fisher tropesch Synthesis. (2)
 (OR)
 b) Compare Lanthanoids and Actinoids. (5)
36. a) i) To Calculate the number of atoms present in sc, bcc, fcc unit cell (3)
 ii) Define unit cell. Write the seven type of unit cell. (2)
 (OR)
 b) Derive integrated rate equations for Zero order reaction. (5)
37. a) i) Write Arrhenius equation and explain the terms involved. (2)
 ii) The rate constant for a first order reaction is $1.54 \times 10^{-3} \text{ S}^{-1}$ Calculate its half life time. (3)
 (OR)
 b) Derive the expression for Ostwald's dilution law. (5)
38. a) i) Write the coupling reaction of phenol (2)
 ii) Explain three methods of preparation of ether. (3)
 (OR)
 b) Write the mechanism of Aldol condensation. (5)

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PART-A

1. CHOOSE THE CORRECT ANSWER.

1. c). Mg
2. NO option correct :
A B C D
3 2 4 1
3. a) Tetrahedral
4. c) $H_2N_2O_2$
5. b) +3
6. d) Both assertion and reason are false.
7. b) FeO
8. a) 20 minutes
9. b) Activation energy
10. c) strongly acidic
11. a) $2 \times 10^{-3} M$
12. d) Blue
13. a) Ethylene glycol
14. b) Cannizaro reaction
15. a) Formic acid.

பகுதி - 2

I. பின்வரும் வினாக்களுக்கு சரியான விடையை எழுதின.

1. க) Mg
2. A B C D
3 2 4 1
3. அ) நான்குகோண
4. க) $H_2N_2O_2$
5. க) +3
6. ஈ) கூற்று மற்றும் காரணம் இரண்டும் தவறு
7. க) FeO
8. அ) 20 நிமிடங்கள்
9. க) செயல்பாட்டு ஆற்றல்
10. க) வலுவான அமிலத்தன்மை கொண்டது.
11. அ) $2 \times 10^{-3} M$
12. ஈ) நீலம்
13. அ) எதிலீன் கிளைக்கோல்
14. க) கன்னிசாரோ வினை
15. அ) ஃரமிக் அமிலம்

Answer: 8.

13. IUPAC NAME:

ethan-1,2-diol

Common NAME: Ethylene glycol.

$t_{75\%} = 2 t_{50\%}$

$t_{50\%} = \frac{t_{75\%}}{2}$

$t_{50\%} = \frac{20}{2} = 10$

PART-1)

11. [Q.NO 24 is compulsory]

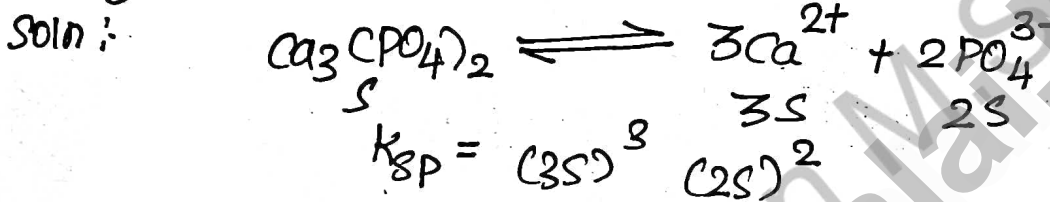
24. Which is more stable Fe^{3+} (or) Fe^{2+} ? Explain

Fe^{3+} ion is more stable due to its half filled $3d^5$ configuration. but Fe^{2+} ion has $3d^6$ configuration

PART-III

[Q.NO 33 is compulsory]

33. Write the expression for the solubility product of $Ca_3(PO_4)_2$.



$K_{sp} = 27S^3 \cdot 4S^2$

$K_{sp} = 108 S^5$

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வினா எண். 24 க்கு கட்டாயம்

விடைபயன்படுத்தவும்.

24. Fe^{3+} மற்றும் Fe^{2+} ஆகிய இரண்டு அயனிகளில் எது அதிக நிலைப்படுத்தத்தக்கது? உடையது என்ன?

* Fe^{3+} அயனியில் $3d^5$ அமைப்பைக் கொண்டிருக்கிறது.

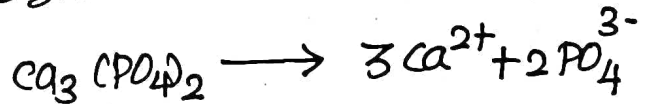
* Fe^{2+} அயனியில் $3d^6$ அமைப்பைக் கொண்டிருக்கிறது.

Fe^{3+} அயனியின் நிலைப்பாடு அதிகமாக உள்ளதால் $3d^5$ அமைப்பைக் கொண்டிருக்கிறது. எனவே Fe^{3+} அயனி Fe^{2+} அயனிக்கு விடையில் அதிகமாக நிலைப்படுத்தத்தக்கது.

வினா எண். 33 க்கு கட்டாயம்

விடைபயன்படுத்தவும்.

33. $Ca_3(PO_4)_2$ இன் கரைதிறனைக் குறிப்பிடுகின்ற கரைதிறன் வினைக்கான சமன்பாட்டை எழுதிக்கொடுக்கவும்.



$K_{sp} = [Ca^{2+}]^3 [PO_4^{3-}]^2$

$K_{sp} = (3S)^3 (2S)^2$

$K_{sp} = 27S^3 \cdot 4S^2$

$K_{sp} = 108 S^5$