

I MID TERM TEST 2023

12 – Std.

Chemistry

Reg.No.

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Total Marks : 35

Time : 1.30 Hrs

Part A

Answer all the questions:

10 x 1 = 10

1. Which of the following statement, about the advantage of roasting of sulphide ore before reduction is not true?
 a) ΔG° of sulphide is greater than those for CS_2 and H_2S . b) ΔG is negative for roasting of sulphide ore to oxide.
 c) Roasting of the sulphide to its oxide is thermodynamically feasible.
 d) Carbon and hydrogen are suitable reducing agents for metal sulphides.

2. Match items in column – I with the items of column – II and assign the correct code.

Column - I	Column - II
A Borazole	1 $B(OH)_3$
B Boric acid	2 $B_3N_3H_6$
C Quartz	3 $Na_2[B_4O_5(OH)_4] \cdot 8H_2O$
D Borax	4 SiO_2

	A	B	C	D
(a)	2	1	4	3
(b)	1	2	4	3
(c)	1	2	4	3
(d)	None of these			

3. The compound that is used in nuclear reactors as protective shields and control rods is
 a) Metal borides b) Metal oxides c) Metal carbonates d) Metal carbide
4. The crystal with a metal deficiency defect is a) NaCl b) FeO c) ZnO d) KCl
5. The decomposition of phosphine (PH_3) on tungsten at low pressure is a first order reaction. It is because the
 a) rate is proportional to the surface coverage b) rate is inversely proportional to the surface coverage c) rate is independent of the surface coverage d) rate of decomposition is slow
6. The addition of a catalyst during a chemical reaction alters which of the following quantities?
 a) Enthalpy b) Activation energy c) Entropy d) Internal energy
7. If 75% of a first order reaction was completed in 60 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
8. Which one of the following is the strongest acid
 a) 2 – nitrophenol b) 4 – chlorophenol c) 4 – nitrophenol d) 3 – nitrophenol
9. Assertion : Phenol is more reactive than benzene towards electrophilic substitution reaction
 Reason : In the case of phenol, the intermediate arenium ion is more stabilized by resonance.
 a) if both assertion and reason are true and reason is the correct explanation of assertion. b) if 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.
10. $HO-CH_2CH_2-OH$ on heating with periodic acid gives a) methanoic acid b) Glyoxal c) methanal d) CO_2 .

Part B

Answer any three of the following, Q.No. 15 is compulsory

3 x 2 = 6

11. Give the limitations of Ellingham diagram.
12. How will you identify borate radical?
13. Classify the following solids. a) P_4 b) Brass c) diamond d) NaCl
14. Explain Kolbe's reaction.
15. The rate constant for a first order reaction is $1.54 \times 10^{-3} s^{-1}$. Calculate its half life time.

Part C

Answer any three of the following: Q.No. 20 is compulsory

3 x 3 = 9

16. Complete the following reaction.
 a. $B(OH)_3 + NH_3 \longrightarrow$
 b. $Na_2B_4O_7 + H_2SO_4 + H_2O \longrightarrow$
17. Distinguish tetrahedral and octahedral voids.
18. Give the differences between order and molecularity of reaction.
19. How is phenol prepared from i) chloro benzene ii) isopropyl benzene
20. An organic compound (A) – $C_3H_8O_3$ used as a sweetening agent, which on oxidation with Fenton's reagent gives a mixture of compounds B and C. Identify A, B & C.

Part D

Answer all the questions

2 x 5 = 10

21. A) i) Describe the structure of diborane ii) Give the uses of silicones. (OR)
 B) i) Aluminium crystallizes in a cubic close packed structure. Its metallic radius is 125 pm. Calculate the edge length of unit cell. ii) Write Bragg's equation.
22. A) Derive integrated rate law for first order reaction. $A \longrightarrow \text{product}$ (OR)
 B) How will you distinguish primary, secondary and tertiary alcohol using Victor Meyer's method?