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JEE MAIN (APRIL) 2023 (10-04-2023-FN)

Memory Based Question Paper
CHEMISTRY



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CHEMISTRY

1. The number of moles and molecules of O_2 in 28.375L of oxygen gas at STP.

Ans. 1.25, 7.525×10^{23}

Sol. Number of moles of $O_2 = \frac{28.375}{22.7} = 1.25$

\Rightarrow Number of molecule = $1.25 N_A = 7.525 \times 10^{23}$

2. The compound which does not exist.

(1) $BeCl_2$ (2) NaO_2 (3) $PbEt_4$ (4) $(NH_4)_2BeF_4$

Ans. (2)

Sol. NaO_2 (Super oxide of sodium is unstable)

3. Stabilizer use for concentrating sulphide ores :

(1) Fatty acid (2) Pine oil (3) Cresol (4) Xentate

Ans. (3)

Sol. Cresol

4. Which of the following is correct regarding adsorption ?

(1) $\Delta H_{adsorption} \Rightarrow +ve$, ΔH of micelle formation $\Rightarrow +ve$

(2) $\Delta H_{adsorption} \Rightarrow -ve$, ΔH of micelle formation $\Rightarrow +ve$

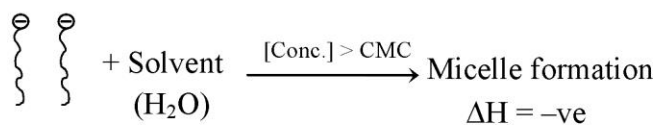
(3) $\Delta H_{adsorption} \Rightarrow +ve$, ΔH of micelle formation $\Rightarrow -ve$

(4) $\Delta H_{adsorption} \Rightarrow -ve$, ΔH of micelle formation $\Rightarrow -ve$

Ans. (4)

Sol. $\Delta H_{adsorption}$

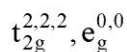
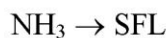
gas + solid $\xrightarrow{\text{adsorption}}$ gas/solid ; $\Delta H = -ve$



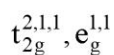
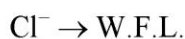
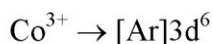
5. Which of the following is low spin diamagnetic, octahedral complex ?

- (1) $[\text{CoCl}_6]^{3-}$ (2) $[\text{CoF}_6]^{3-}$ (3) $[\text{Co}(\text{NH}_3)_6]^{3+}$ (4) $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$

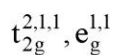
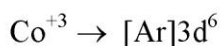
Ans. (3)



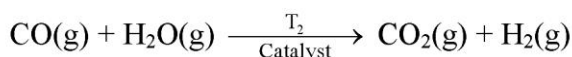
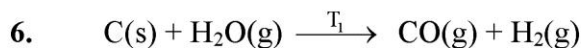
(Complex is diamagnetic and low spin)



(Paramagnetic and high spin)



(Paramagnetic and high spin)



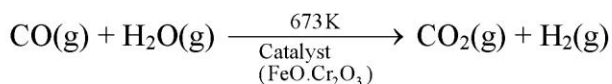
(1) $T_1 = T_2$

(2) $T_1 > T_2$

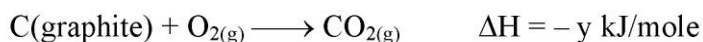
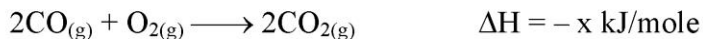
(3) $T_1 < T_2$

(4) $T_1 = 100 \text{ K}, T_2 = 1270 \text{ K}$

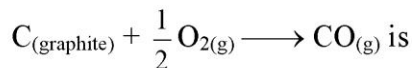
Ans. (2)



7. Select the correct option



Then ΔH for



(1) $x - \frac{y}{2}$

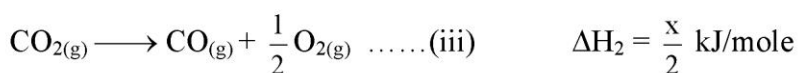
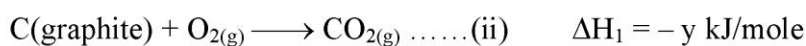
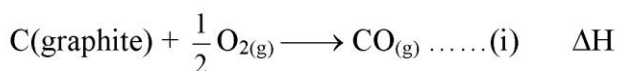
(2) $\frac{x-2y}{2}$

(3) $\frac{x+2y}{2}$

(4) $\frac{x-y}{2}$

Ans. (2)

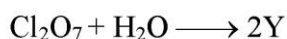
Sol. Target equation



eq. (i) = eq. (ii) + eq. (iii)

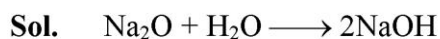
$$\therefore \Delta H = \frac{x}{2} - y = \frac{x-2y}{2}$$

8. $\text{Na}_2\text{O} + \text{H}_2\text{O} \longrightarrow 2\text{X}$



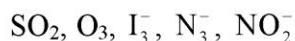
Number of 'O' atom in one molecules of X and Y.

Ans. 5

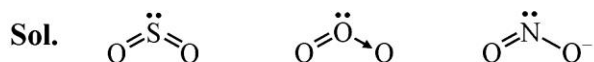


So, $1 + 4 = 5$

9. How many of the following are bent in shape

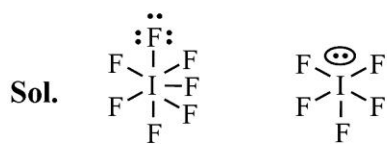


Ans. 3



10. Calculate total number lone pairs in IF_7 & IF_5 .

Ans. 37



$$\text{Total lone pairs} = 21 + 16 = 37$$

11. Number of electrons in t_{2g} set of orbitals in potassium ferrocyanide is ...

Ans. 6



12. Prolonged heating of ferrous ammonium sulphate is avoided to prevent :

- (1) Oxidation (2) Reduction (3) Hydrolysis (4) Breaking

Ans. (1)

Sol. Prolong heating will cause oxidation of $\text{Fe}^{2+} \rightarrow \text{Fe}^{3+}$

13. An ideal gas is taken at 930.2 mm of Hg pressure in a certain volume. What will be the final pressure if volume is reduced by 40% at constant temperature ?



$$930.2 \times 100 = P_2 \times 60$$

$$P_2 = 1550 \text{ mm of Hg}$$

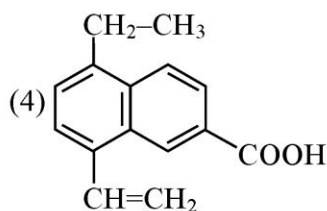
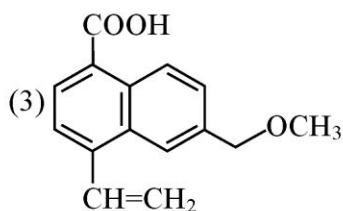
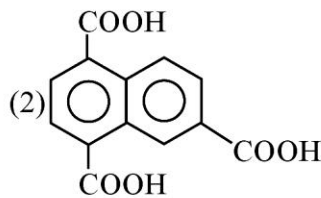
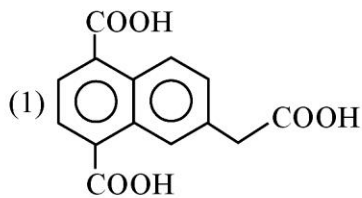
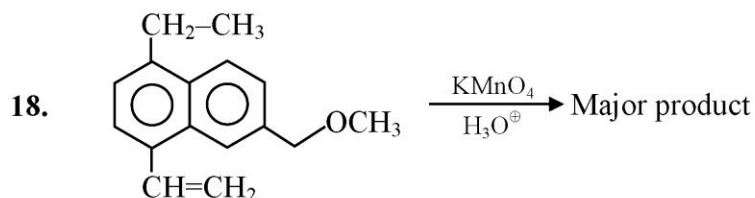
14. Read the following two statements :

Statement-1 : Potassium dichromate is used in volumetric analysis.

Statement-2 : $\text{K}_2\text{Cr}_2\text{O}_7$ is more soluble in water than $\text{Na}_2\text{Cr}_2\text{O}_7$.

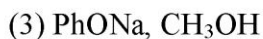
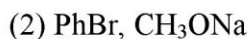
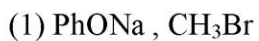
- (1) Both statements-1 and 2 are correct.
 (2) Both statement-1 and 2 are incorrect
 (3) Statement-1 is correct and statement-2 is incorrect.
 (4) Statement-1 is incorrect and statement-2 is correct.

Ans. (3)



Ans. (2)

19. Which reactants are used to prepare phenyl methyl ether?



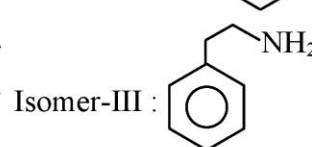
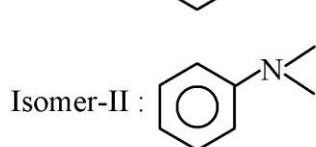
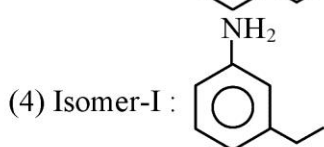
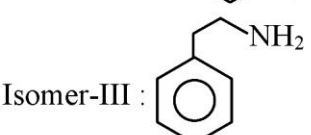
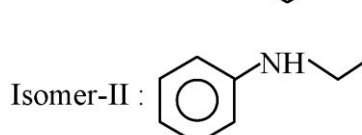
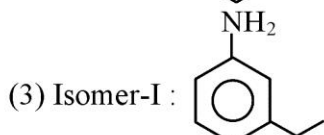
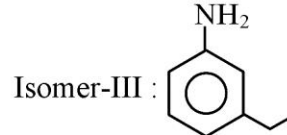
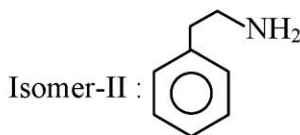
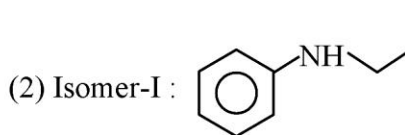
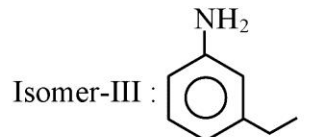
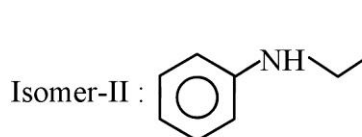
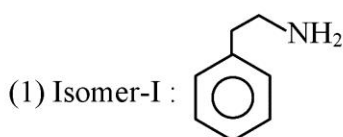
Ans. (1)

20. Following observations are found for the isomeric compounds of C₈H₁₁N.

Isomer-I : Can prepare by Gabriel phthalimide synthesis

Isomer-II : Reacts with Hinsberg reagent but does not soluble in NaOH

Isomer-III : Reacts with HNO₂ and form azodye



Ans. (1)

21. Which does not stabilise secondary and tertiary structure of protein?

- (1) Hydrogen bonding (2) S–S linkage
(3) van der waals force (4) H–H linkage

Ans. (4)

Sol. Secondary and tertiary structure of protein are stabilise by H-bonding, disulphide linkage, ionic bonding as well as van der waals forces.

22. **Column-I**

- (a) Nylon-26
(b) Dacron
(c) Urea formaldehyde resin
(d) Buna-N

Column-II

- (p) Addition polymer
(q) Thermosetting polymer
(r) Polyester linkages
(s) Biodegradable

Ans. a → s, b → r, c → q, d → p.

23. **Column-I**

- (a) Steel industry
(b) Thermal power plant
(c) Fertilizer industry
(d) Paper mill

Column-II (Waste product)

- (p) Fly ash
(q) Slag
(r) Biodegradable
(s) Gypsum

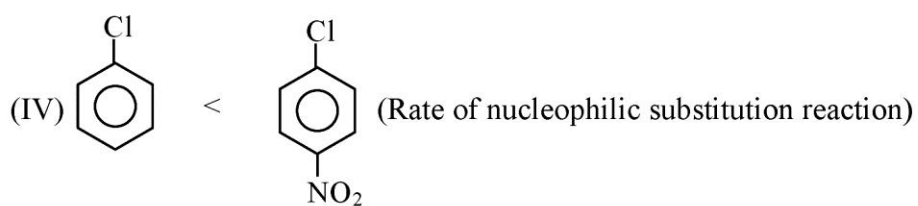
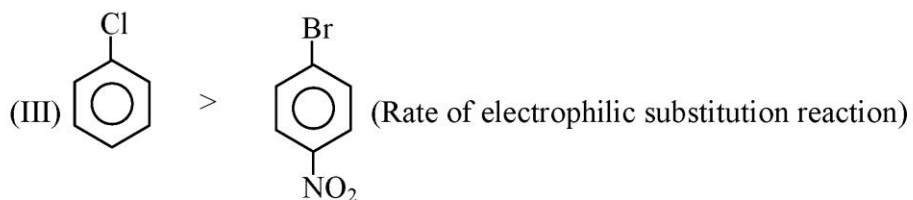
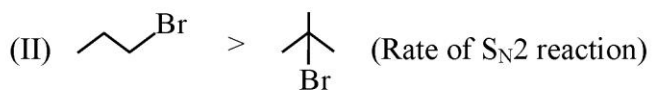
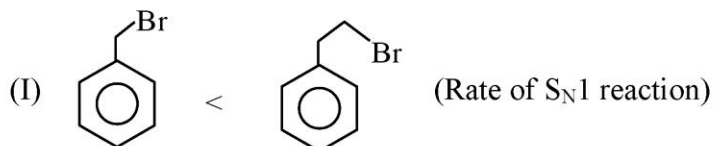
Ans. a → q, b → p, c → s, d → r

24. Which of the following pair of compounds have not zero dipole moment ?

- (1) CH_2Cl_2 , CHCl_3
(2) Cis-butene, trans-butene
(3) 1,2-dichloro benzene, 1,4-dichloro benzene
(4) Benzene and chlorobenzene

Ans. (1)

25. Observe the following compound for their rate of reaction.



The correct option is

(1) II, III, IV

(2) I, II

(3) I, IV

(4) I, II, III

Ans. (1)