

PREVIOUS YEARS' QUESTIONS

EXERCISE-II

- The oxidation states of the most electronegative element in the products of the reaction of BaO_2 with dilute H_2SO_4 . [JEE 1991]
 (1) 0 and -1 (2) -1 and -2
 (3) -2 and 0 (4) -2 and +2
- For the redox reaction, [JEE 1992]
 $\text{MnO}_4^- + \text{C}_2\text{O}_4^{2-} + \text{H}^+ \rightarrow \text{Mn}^{2+} + \text{CO}_2 + \text{H}_2\text{O}$
 the correct coefficients of the reactants for the balanced reaction are :

MnO_4^-	$\text{C}_2\text{O}_4^{2-}$	H^+
(1) 2	5	16
(2) 16	5	2
(3) 5	16	2
(4) 2	16	5
- A 5.0 cm^3 solution of H_2O_2 liberates 0.508 g of iodine from an acidified KI solution. Calculate the strength of H_2O_2 solution in terms of volume strength at STP. [JEE' 1995]
 (1) 2.48 (2) 3.48 (3) 4.48 (4) 5.48
- The number of mole of KMnO_4 that will need to react completely with one mole ferrous oxalate in acidic solution is : [JEE 1997]
 (1) 2/5 (2) 3/5 (3) 4/5 (4) 1
- The equivalent mass of MnSO_4 is half its molecular mass when it is converted to : [JEE 1998]
 (1) Mn_2O_3 (2) MnO_2
 (3) MnO_4^- (4) MnO_4^{2-}
- How many millilitre of 0.5 M H_2SO_4 are needed to dissolve 0.5 g of copper II carbonate ? [JEE 1999]
 (1) 7.097 (2) 8.097 (3) 10 (4) 12
- Among the following species in which oxidation state of the element is +6 : [JEE 2000]
 (1) MnO_4^- (2) $\text{Cr}(\text{CN})_6^{3-}$
 (3) NiF_6^{2-} (4) CrO_2Cl_2
- Oxidation number of iron in $\text{Na}_2[\text{Fe}(\text{CN})_5\text{NO}^\oplus]$ is: [JEE 2001]
 (1) +2 (2) +3
 (3) +8/3 (4) none of these
- An aqueous solution of 6.3 g of oxalic acid dihydrate is made upto 250 mL. The volume of 0.1 N NaOH required to completely neutralise 10 mL of this solution is : [JEE 2001]
 (1) 40 mL (2) 20 mL
 (3) 10 mL (4) 4 mL
- MnO_4^- is good oxidising agent in different medium changing to - [AIEEE-02]

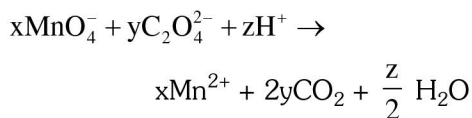
MnO_4^-	\longrightarrow	Mn^{2+}
	\longrightarrow	MnO_4^{2-}
	\longrightarrow	MnO_2
	\longrightarrow	Mn_2O_3

 Changes in oxidation number respectively are -
 (1) 1, 3, 4, 5 (2) 5, 4, 3, 2
 (3) 5, 1, 3, 4 (4) 2, 6, 4, 3

- Oxidation number of Cl in CaOCl_2 (bleaching powder is) [AIEEE-02]
 (1) Zero, since it contains Cl_2
 (2) -1, since it contains Cl^-
 (3) +1, since it contains ClO^-
 (4) +1 and -1 since it contains ClO^- and Cl^-
- Which of the following is a redox [AIEEE-02]
 (1) $2\text{NaAg}(\text{CN})_2 + \text{Zn} \longrightarrow \text{Na}_2\text{Zn}(\text{CN})_4 + 2\text{Ag}$
 (2) $\text{BaO}_2 + \text{H}_2\text{SO}_4 \longrightarrow \text{BaSO}_4 + \text{H}_2\text{O}_2$
 (3) $\text{N}_2\text{O}_5 + \text{H}_2\text{O} \longrightarrow 2\text{HNO}_3$
 (4) $\text{AgNO}_3 + \text{KI} \longrightarrow \text{AgI} + \text{KNO}_3$
- In the coordination compound, $\text{K}_4[\text{Ni}(\text{CN})_6]$, the oxidation state of nickel is [AIEEE-03]
 (1) +1 (2) +2
 (3) -1 (4) 0
- The oxidation state of Cr in $[\text{Cr}(\text{NH}_3)_4\text{Cl}_2]^+$ is - [AIEEE-05]
 (1) +2 (2) +3 (3) 0 (4) +1
- The oxidation state of chromium in the final product formed by the reaction between KI and acidified potassium dichromate solution is - [AIEEE-05]
 (1) +6 (2) +4 (3) +3 (4) +2
- Reduction of the metal centre in aqueous permanganate ion involves - [JEE-2011]
 (1) 3 electrons in neutral medium
 (2) 5 electrons in neutral medium
 (3) 3 electrons in alkaline medium
 (4) 5 electrons in acidic medium
- Which ordering of compounds is according to the decreasing order of the oxidation state of nitrogen- [JEE- 2012]
 (1) $\text{HNO}_3, \text{NO}, \text{NH}_4\text{Cl}, \text{N}_2$
 (2) $\text{HNO}_3, \text{NO}, \text{N}_2, \text{NH}_4\text{Cl}$
 (3) $\text{HNO}_3, \text{NH}_4\text{Cl}, \text{NO}, \text{N}_2$
 (4) $\text{NO}, \text{HNO}_3, \text{NH}_4\text{Cl}, \text{N}_2$
- 25 mL of household bleach solution was mixed with 30 mL of 0.50 M KI and 10 mL of 4 N acetic acid. In the titration of the liberated iodine, 48 mL of 0.25 N $\text{Na}_2\text{S}_2\text{O}_3$ was used to reach the end point. The molarity of the household bleach solution is [JEE- 2012]
 (1) 0.48 M (2) 0.96 M
 (3) 0.24 M (4) 0.024 M
- Given :
 $\text{X Na}_2\text{HAsO}_3 + \text{Y NaBrO}_3 + \text{Z HCl} \rightarrow$
 $\text{NaBr} + \text{H}_3\text{AsO}_4 + \text{NaCl}$
 The values of X, Y and Z in the above redox reaction are respectively : [JEE(Main-online)-2013]
 (1) 2, 1, 3 (2) 3, 1, 6
 (3) 2, 1, 2 (4) 3, 1, 4

20. Consider the following reaction:

[JEE(Main)-2013]

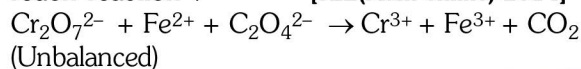


The values of x, y and z in the reaction are respectively :-

- (1) 5, 2 and 16 (2) 2, 5 and 8
 (3) 2, 5 and 16 (4) 5, 2 and 8

21. How many electrons are involved in the following redox reaction ?

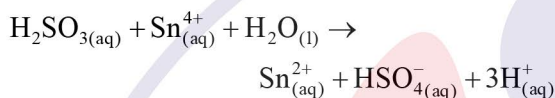
[JEE(Main-online)-2014]



- (1) 3 (2) 4
 (3) 5 (4) 6

22. Consider the reaction

[JEE(Main-online)-2014]



Which of the following statements is correct?

- (1) H_2SO_3 is the reducing agent because it undergoes oxidation
 (2) H_2SO_3 is the reducing agent because it undergoes reduction
 (3) Sn^{4+} is the reducing agent because it undergoes oxidation
 (4) Sn^{4+} is the oxidizing agent because it undergoes oxidation

23. In which of the following reaction H_2O_2 acts as a reducing agent ?

[JEE(Main)-2014]

- (a) $\text{H}_2\text{O}_2 + 2\text{H}^+ + 2\text{e}^- \rightarrow 2\text{H}_2\text{O}$
 (b) $\text{H}_2\text{O}_2 - 2\text{e}^- \rightarrow \text{O}_2 + 2\text{H}^+$
 (c) $\text{H}_2\text{O}_2 + 2\text{e}^- \rightarrow 2\text{OH}^-$
 (d) $\text{H}_2\text{O}_2 + 2\text{OH}^- - 2\text{e}^- \rightarrow \text{O}_2 + 2\text{H}_2\text{O}$
 (1) (a), (c) (2) (b), (d) (3) (a), (b) (4) (c), (d)

24. The molecular formula of a commercial resin used for exchanging ions in water softening is $\text{C}_8\text{H}_7\text{SO}_3\text{Na}$ (Mol. w.t 206). What would be the maximum uptake of Ca^{2+} by the resin when expressed in mole per gram resin ?

[JEE(Main)-2015]

- (1) $\frac{2}{309}$ (2) $\frac{1}{412}$ (3) $\frac{1}{103}$ (4) $\frac{1}{206}$

25. The volume of 0.1N dibasic acid sufficient to neutralize 1 g of a base that furnishes 0.04 mole of OH^- in aqueous solution is :

[JEE(Main)-OnLine-2016]

- (1) 400 mL (2) 200 mL
 (3) 600 mL (4) 800 mL

26. Which of the following reactions is an example of a redox reaction ?

[JEE(Main)-2017]

- (1) $\text{XeF}_4 + \text{O}_2\text{F}_2 \rightarrow \text{XeF}_6 + \text{O}_2$
 (2) $\text{XeF}_2 + \text{PF}_5 \rightarrow [\text{XeF}]^+\text{PF}_6^-$
 (3) $\text{XeF}_6 + \text{H}_2\text{O} \rightarrow \text{XeOF}_4 + 2\text{HF}$
 (4) $\text{XeF}_6 + 2\text{H}_2\text{O} \rightarrow \text{XeO}_2\text{F}_2 + 4\text{HF}$

27. In which of the following reaction, hydrogen peroxide acts as an oxidizing agent ?

[JEE(Main)-OnLine-2017]

- (1) $\text{I}_2 + \text{H}_2\text{O}_2 + 2\text{OH}^- \rightarrow 2\text{I}^- + 2\text{H}_2\text{O} + \text{O}_2$
 (2) $\text{HOCl} + \text{H}_2\text{O}_2 \rightarrow \text{H}_3\text{O}^+ + \text{Cl}^- + \text{O}_2$
 (3) $\text{PbS} + 4\text{H}_2\text{O}_2 \rightarrow \text{PbSO}_4 + 4\text{H}_2\text{O}$
 (4) $2\text{MnO}_4^- + 3\text{H}_2\text{O}_2 \rightarrow 2\text{MnO}_2 + 3\text{O}_2 + 2\text{H}_2\text{O} + 2\text{OH}^-$

28. The pair of compounds having metal in their highest oxidation state is :

[JEE(Main)-OnLine-2017]

- (1) $[\text{NiCl}_4]^{2-}$ and $[\text{CoCl}_4]^{2-}$
 (2) $[\text{Fe}(\text{CN})_6]^{3-}$ and $[\text{Cu}(\text{CN})_4]^{2-}$
 (3) $[\text{FeCl}_4]^-$ and Co_2O_3
 (4) MnO_2 and CrO_2Cl_2

29. In KO_2 , the nature of oxygen species and the oxidation state of oxygen atom are, respectively

[JEE(Main)-OnLine-2018]

- (1) Superoxide and $-1/2$
 (2) Oxide and -2
 (3) Peroxide and $-1/2$
 (4) Superoxide and -1

30. To measure the quantity of MnCl_2 dissolved in an aqueous solution, it was completely converted to KMnO_4 using the reaction,

[JEE- 2018]

$$\text{MnCl}_2 + \text{K}_2\text{S}_2\text{O}_8 + \text{H}_2\text{O} \rightarrow \text{KMnO}_4 + \text{H}_2\text{SO}_4 + \text{HCl}$$

(equation not balanced).

Few drops of concentrated HCl were added to this solution and gently warmed. Further, oxalic acid (225 g) was added in portions till the colour of the permanganate ion disappeared. The quantity of MnCl_2 (in mg) present in the initial solution is _____. (Atomic weights in g mol^{-1} : $\text{Mn} = 55$, $\text{Cl} = 35.5$)

PREVIOUS YEARS QUESTIONS				ANSWER KEY				Exercise-II			
Que.	1	2	3	4	5	6	7	8	9	10	
Ans.	2	1	3	2	2	2	4	1	1	3	
Que.	11	12	13	14	15	16	17	18	19	20	
Ans.	4	1	2	2	3	1,2,4	2	3	2	3	
Que.	21	22	23	24	25	26	27	28	29	30	
Ans.	4	1	2	2	1	1	3	2	1	126	