



DPP –3 [Application of Electrochemical series] Chapter: Electrochemistry

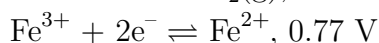
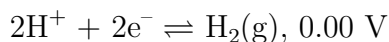
Even on bad days, do minimum 30 focused minutes. Consistency is built by not breaking the chain.' "You are allowed to study less. You are not allowed to study zero."
Even on bad days, do minimum 30 focused minutes. Consistency is built by not breaking the chain.'

TYPE–1 : Oxidizing & Reducing Agents

- The E° values for M^{3+}/M^{2+} couple for Cr, Mn, Fe and Co are -0.41 , $+1.57$, $+0.77$ and $+1.97$ respectively. For which one of these metals, the change in oxidation state from $+2$ to $+3$ is easiest**
 - Cr
 - Mn
 - Fe
 - Co
- The standard electrode potential value of the elements A, B and C are 0.68 , -2.50 and 0.50 V respectively. The order of their reducing power is :**
 - $A > B > C$
 - $A > C > B$
 - $C > B > A$
 - $B > C > A$
- The standard reduction potential value of three metallic cations X, Y and Z are 0.52 , -3.303 and -1.18 V respectively. The order of reducing power of the corresponding metals is**
 - $Y > Z > X$
 - $X > Y > Z$
 - $Z > Y > X$
 - $Z > X > Y$
- The standard electrode potential (E) values of Al^{3+}/Al , Ag^+/Ag , K^+/K and Cr^{3+}/Cr are -1.66 V, 0.80 V, -2.93 V and -0.74 V, respectively. The correct decreasing order of reducing power of the metal is**

[NEET-2019 (Odisha)]

 - $Al > K > Ag > Cr$
 - $Ag > Cr > Al > K$
 - $K > Al > Cr > Ag$
 - $K > Al > Ag > Cr$
- Standard reduction electrode potential of three metals A, B and C are respectively $+0.5$ V, -3.0 V and -1.2 V. The reducing power of these metals are :**
 - $C > B > A$
 - $A > C > B$
 - $B > C > A$
 - $A > B > C$
- The standard reduction potentials at $25^\circ C$ for the following half reactions are given against each :**
 $Zn^{2+} (aq) + 2e^- \rightleftharpoons Zn(s), -0.762$ V
 $Cr^{3+} (aq) + 3e^- \rightleftharpoons Cr(s), -0.740$ V



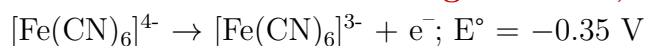
Which is the strongest reducing agent ?

- (1) Zn (2) Cr
(3) $\text{H}_2(\text{g})$ (4) $\text{Fe}^{2+}(\text{aq})$

7. **The standard reduction potential at 25 °C of Li^+ / Li , $\text{Ba}^{2+} / \text{Ba}$, Na^+ / Na and $\text{Mg}^{2+} / \text{Mg}$ are -3.05 V , -2.73 V , -2.71 V and -2.37 V respectively. Which one of the following is the strongest oxidising agent ?**

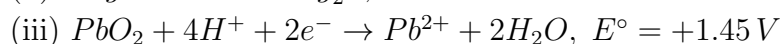
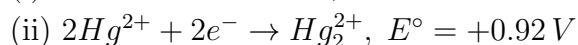
- (1) Na^+ (2) Li^+
(3) Ba^{2+} (4) Mg^{2+}

8. **On the basis of the following E° values, the strongest oxidizing agent is :-**



- (1) Fe^{3+} (2) $[\text{Fe}(\text{CN})_6]^{3-}$
(3) $[\text{Fe}(\text{CN})_6]^{4-}$ (4) Fe^{2+}

9. **Standard electrode potential of some half cell reactions are given below:**



Which of the following statement is correct according to electrode potential?

- (a) Pb^{2+} is more powerful reducing agent than Sn^{2+}
(b) Sn^{4+} is more powerful oxidising agent than Pb^{4+}
(c) Sn^{2+} is more powerful reducing agent than Hg_2^{2+}
(d) Hg_2^{2+} is more powerful oxidising agent than Pb^{4+}

10. **Which of the following can oxidise fluoride ions?**

- (1) O_3
(2) Cl_2
(3) Br_2
(4) No chemical substance

TYPE-2 : Displacement Reactions & Activity Series

11. **Four alkali metals A, B, C & D have standard electrode potentials -3.05 , -1.66 , -0.40 and 0.80 V respectively. Which metal will be the most reactive**

- (1) A (2) B
(3) C (4) D

12. **The standard electrode potential of Zn, Ag and Cu are -0.76 V , 0.80 V and 0.34 V respectively, then :**

- (1) Ag can oxidise Zn and Cu
(2) Ag can reduce Zn^{2+} and Cu^{2+}
(3) Zn can reduce Ag^+ and Cu^{2+}
(4) Cu can oxidise Zn and Ag

13. **E° values of Mg^{2+}/Mg , Zn^{2+}/Zn and Fe^{2+}/Fe are -2.37 V , -0.76 V and -0.44 V respectively. Which of the following statements is correct**

(1) Zn will reduce Fe^{2+} (2) Zn will reduce Mg^{2+}

(3) Mg oxidises Fe (4) Zn oxidises Fe

14. **A standard reduction electrode potentials of four elements are**

A = -0.250 V , B = -0.140 V

C = -0.126 V , D = -0.402 V

The element that displaces A from its compounds aqueous solution is :-

(1) B

(2) C

(3) D

(4) None of the above

15. **Using the standard electrode potential values given below, decide which of the statements, I, II, III and IV are correct. Choose the right answer from (1), (2), (3) and (4).**

$\text{Fe}^{2+} + 2\text{e}^- \rightleftharpoons \text{Fe}$; $E^\circ = -0.44\text{ V}$

$\text{Cu}^{2+} + 2\text{e}^- \rightleftharpoons \text{Cu}$; $E^\circ = +0.34\text{ V}$

$\text{Ag}^+ + \text{e}^- \rightleftharpoons \text{Ag}$; $E^\circ = +0.80\text{ V}$

I. Copper can displace iron from FeSO_4 solution.

II. Iron can displace copper from CuSO_4 solution.

III. Silver can displace copper from CuSO_4 solution.

IV. Iron can displace silver from AgNO_3 solution.

(1) I and II (2) II and III

(3) II and IV (4) I and IV

16. **A gas X at 1 atm is bubbled through a solution containing a mixture of 1 M Y^- and 1 M Z^- at 25 °C. If the reduction potential of $\text{Z} > \text{Y} > \text{X}$ then :**

(1) Y will oxidise X and not Z

(2) Y will oxidise Z and not X

(3) Y will oxidise both X and Z

(4) Y will reduce both X and Z

17. **If the standard reduction potential E for four divalent elements X, Y, Z & W are -1.46 V , -0.15 V , $+0.15\text{ V}$ and -1.24 V respectively then**

(1) X will replace Z^{2+} from aqueous solution

(2) Y will replace Z^{2+} from aqueous solution

(3) W will replace Z^{2+} from aqueous solution

(4) All statements are correct

18. **Red hot carbon will remove oxygen from the oxide XO and YO but not from ZO. Y will remove oxygen from XO. Use this evidence to deduce the order of activity of the three metals X, Y and Z putting the most active first.**

(1) XYZ (2) ZYX

(3) YXZ (4) ZXY

19. **The following facts are available :-**

$2\text{X}^- + \text{Y}_2 \rightarrow 2\text{Y}^- + \text{X}_2$

$2\text{W}^- + \text{Y}_2 \rightarrow \text{no reaction}$

$2\text{Z}^- + \text{X}_2 \rightarrow 2\text{X}^- + \text{Z}_2$

Which of the following statements is correct :-

- (1) $E^\circ_{W^-/W_2} > E^\circ_{Y^-/Y_2} > E^\circ_{X^-/X_2} > E^\circ_{Z^-/Z_2}$
 (2) $E^\circ_{W^-/W_2} < E^\circ_{Y^-/Y_2} < E^\circ_{X^-/X_2} < E^\circ_{Z^-/Z_2}$
 (3) $E^\circ_{W^-/W_2} < E^\circ_{Y^-/Y_2} > E^\circ_{X^-/X_2} > E^\circ_{Z^-/Z_2}$
 (4) $E^\circ_{W^-/W_2} > E^\circ_{Y^-/Y_2} < E^\circ_{X^-/X_2} < E^\circ_{Z^-/Z_2}$
20. **Each of the three metals x, y and z were put in turn into aqueous solution of the other two. $x + \text{salt of } y \text{ (or } z) \rightarrow y \text{ (or } z) + \text{salt of } x$**
Which one of the following observation is incorrect?
- (1) $y + \text{salt of } x \rightarrow \text{no action observed}$
 (2) $y + \text{salt of } z \rightarrow z + \text{salt of } y$
 (3) $z + \text{salt of } x \rightarrow x + \text{salt of } z$
 (4) $z + \text{salt of } y \rightarrow \text{no action observed}$
21. **The following facts are available**
 $2A^- + B_2 \rightarrow 2B^- + A_2$
 $2C^- + B_2 \rightarrow \text{No reaction}$
 $2D^- + A_2 \rightarrow 2A^- + D_2$
Which of the following statement is correct?
- (1) $E^\circ_{C^-/C_2} > E^\circ_{B^-/B_2} > E^\circ_{A^-/A_2} > E^\circ_{D^-/D_2}$
 (2) $E^\circ_{C^-/C_2} < E^\circ_{B^-/B_2} < E^\circ_{A^-/A_2} < E^\circ_{D^-/D_2}$
 (3) $E^\circ_{C^-/C_2} > E^\circ_{B^-/B_2} < E^\circ_{A^-/A_2} < E^\circ_{D^-/D_2}$
 (4) Can't predict
22. **The following four colourless salt solutions are placed in separate test tubes and a strip of Cu is placed in each solution which finally turns blue :-**
- (1) $Zn(NO_3)_2$ (2) $Mg(NO_3)_2$
 (3) KNO_3 (4) $AgNO_3$
23. **Which of the following displacement does not occur**
- (1) $Zn + 2H^+ \rightarrow Zn^{2+} + H_2 \uparrow$
 (2) $Fe + 2Ag^+ \rightarrow Fe^{2+} + Ag \downarrow$
 (3) $Cu + Fe^{2+} \rightarrow Cu^{2+} + Fe \downarrow$
 (4) $Zn + Pb^{2+} \rightarrow Zn^{2+} + Pb \downarrow$
24. **If a spoon of copper metal is placed in a solution of ferrous sulphate :**
- (1) Cu will precipitate out
 (2) Iron will precipitate
 (3) Cu and Fe will precipitate
 (4) No reaction will take place
25. **Reactivity of metals increases as electropositivity increases, what will happen if a copper spoon is used to stir a solution of aluminium nitrate?**
- (1) The spoon will get coated with aluminium
 (2) An alloy of aluminium and copper is formed
 (3) The solution becomes blue
 (4) There is no reaction.
26. **Adding powdered Pb and Fe to a solution containing 1.0 M in each of Pb^{+2} and Fe^{+2} ions, would result into the formation of :-**
- (1) More of Fe and Pb^{2+} ions
 (2) More of Fe^{+2} and Pb^{2+} ions

- (3) More of Pb and Fe^{+2} ions
(4) More of Fe and Pb
27. **Zn rod is placed in 100 mL of 1M CuSO_4 solution so that molarity of Cu^{2+} changes to 0.7 M. The molarity of SO_4^{2-} at this stage will be**
(1) 0.8 M (2) 1 M
(3) 0.7 M (4) 1.8 M
28. **Zn can not displace following ions from their aqueous solution :**
(1) Ag^+ (2) Cu^{2+}
(3) Fe^{2+} (4) Na^+
29. **The decreasing order of standard electrode potential is**
- [NCERT Pg. 71]
- (1) Li, Al, Zn, Ba
(2) Ba, Al, Zn, Li
(3) Zn, Al, Ba, Li
(4) Zn, Ba, Al, Li
30. **Which one will liberate Br_2 from KBr ?**
(1) HI (2) I_2
(3) Cl_2 (4) SO_2