



CHEMISTRY

BOOKS - V PUBLICATION

REACTIVITY SERIES AND ELECTROCHEMISTRY

Question Bank

1. The solutions of
 $ZnSO_4$, $FeSO_4$, $CuSO_4$ and $AgNO_3$, are

taken in four different test tubes. Suppose, an iron nail is kept immersed in each one.

a) In which test tube the iron nail under goes a colour change?

b) What is the reaction taking place here?

c) Justify your answer. (Refer reactivity series of metals).



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2. Compare the electrolysis of molten potassium chloride and solution of potassium

chloride. What are the processes taking place at the cathode and the anode?



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3. You are given a solution of $AgNO_3$, a solution of $MgSO_4$, a Ag rod and a Mg ribbon. How can you arrange a Galvanic cell using these? Write down the reactions taking place at the cathode and the anode.



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4. Keep two carbon rods immersed in copper sulphate solution. Then pass electricity through the solution.

i) At which electrode does colour change occur-anode or cathode?

ii) Is there any change in the blue colour of the copper sulphate solution?

iii) Write down the chemical equations for the changes occurring here?



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5. When acidified copper sulphate solution is electrolysed oxygen is obtained at the anode.

What arrangements are to be made for this?

Find the element deposited at the cathode.



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6. How many Galvanic cells can be made by using the metals Ag, Cu, Zn and Mg. When Galvanic cells are made using the metals given,

what will be the nature of reactions in each cell? (Reactivity: Mg gt Zn gt Cu gt Ag).



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7. Fill in the blanks.

In Zn-Cu cell

Anode:.....

Cathode:.....



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8. When metals react with water..... gas is produced.



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9. Find the relation and fill up suitably.

Iron react with air to form: Rust

Copper react with air:..... to form.



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10. Which is the positive electrode in electrolysis.



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11. Which is the energy change in galvanic cell?



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12. Which product is obtained in the cathode during the electrolysis of NaCl solution?



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13. When a Zn rod is dipped in $CuSO_4$, the colour of the solution.....



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14. Write an example for electroplating.



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15. The process of obtaining a coating of one metal over another metal using electrolysis is known as...



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16. The order of reactivity of some metals elements are given below.

Na gt Mg gt Zn gt Fe gt Ni gt H gt Cu

a) Which element loses a lustre most easily in exposure to air?

b) Which is the element that cannot displace Hydrogen from di. HCl?



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17. Give reason for the following.

a) Iron vessels are not used as boilers that are used to boil water.

b) Blue vitriol solution is not kept in iron vessels.



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18. Which metal among copper, aluminium and gold loses its metallic luster at a faster rate?

Write the equation of the reaction



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19. Sodium chloride solution is electrolysed using platinum electrodes.

a) Write the chemical equation of the reaction at cathode.

b) What happens when phenolphthalein is added to the solution? State the reason?



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20. a) Which type of metal among the given metals is highly reactive with cold water?

(Mg, Na, Fe)

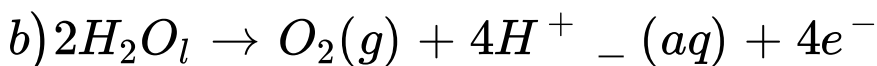
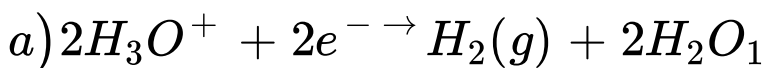
b) Which is the gas produced by the above reaction?



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21. a) Which type of energy change is occurring in an electrolytic cell?

b) Acidified water is electrolysed. Which of the following reactions takes place at the cathode?



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22. A freshly cut piece of sodium when exposed to air for some time loses its lustre in the freshly cut portion.

a) What may be the reason for this?.

b) Write any two chemical equations to substantiate your answer.



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23. The reactivity series of a few metals are given below. Mg gt Zn gt Fe gt Cu gt Ag

a) What happens. ii) When a piece of silver is dipped in zinc sulphate ($ZnSO_4$) solution.

b) If a galvanic cell is constructed using Fe and Ag electrodes which will be the positive electrode?



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24. An experimental set up is made to compare the reactions of Mg, Zn and Cu with dilute hydrochloric acid.

a) Write the observation.

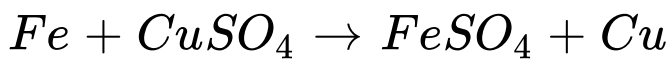
b) Which is the gas evolved when zinc react with dilute hydrochloric acid?

c. Write the equation of the reaction.



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25. The equation of reaction with $CuSO_4$ solution and iron nail is given below.



a) Write the reduction reaction taking place here?

b) Fe will displace Cu from $CuSO_4$ solution.

What is the reason?



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26. Cut a small sodium metal piece into two watch it.

a) What change occurred on the surface of sodium metal?

b) Write one word for the process of this type of decomposition.

c) Write down the equation for this



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27. a) What are the changes that can be observed with the iron rod and the color of copper sulphate solution if iron rod is dipped in copper sulphate solution?

b) Write the equation of the oxidation and reduction reactions.

c) What will be the change if silver rod is used instead of iron rod? What is the reason?



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28. 3: Observe the figure of the galvanic cell given below.

a) Find A and B

b) What about the electron flow?

c) Write down the chemical equation occur at anode and cathode.

'(##VPU_TTT_CHE_X_P01_C03_E05_003_Q01##)'



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29. Aqueous solution of sodium chloride is electrolyzed using platinum electrodes.

a) Identify the ions present in sodium chloride solution?

b) What are the products liberated/deposited at the anode and the cathode.



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30. Answer to the following questions after analysing the picture.

(hint: Order of reactivity of metals Mg gt Zn gt Pbl gt Cu gt Ag)

a) Electron flow starts from which electrode?

b) At which electrode, oxidation occurs? Write equation of chemical reaction taking place at the cathode?

c) We want to reverse the direction of electron flow. Which electrode out of Ag, Mg and Pb should be used instead of Cu.?

'(##VPU_TTT_CHE_X_P01_C03_E05_005_Q01##)'



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31. a) What are the products obtained at anode and cathode during the electrolysis of

molten sodium chloride?

b) If the aqueous solution of sodium chloride is subjected to electrolysis, What are the products obtained reach electrode?



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32. Some galvanic cells are given below.

a) Which among these behave only as the anode?

b) Write the equation for the reaction taking place at the cathode in-cell-3.

c) Write the electron flow of cell-2.

'(##VPU_TTT_CHE_X_P01_C03_E05_007_Q01##)'



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33. Take 25ml water in a beaker and pass electricity through it. The add little sulphuric acid in it.

a) Why electricity didnot pass through pure water? b) What is your observation when H_2SO_4 is added in water?

c) Which type of ion formed more, when sulphuric acid is added in water.



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34. Examine the pictures.

Analyse the pictures and answer the following questions.

a) Write the energy change in picture-2.

b) Write the chemical reaction that takes place in the anode in galvanic cell.

c) Write the oxidation reaction in picture-1.

'(##VPU_TTT_CHE_X_P01_C03_E05_010_Q01##)'



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35. Take hot water and cold water in two test tubes. Add one drop of phenolphthalein to both of the test tubes. Then add magnesium ribbon of the same size to this test tubes.

a) Which test tubes shows the sudden formation of pink colour?

b) What is the reason for the sudden

formation of pink colour?

c) Which gas is formed?

d) Write the equation for the chemical reaction.



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36. Observe the figure of the galvanic cell given below.

a) What are A and B electrodes?

b) From which metal to which metal does the electrons flow?

c) Which metal acts as the cathode?

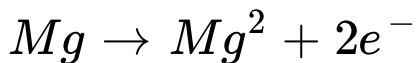
d) Write down the equation for the redox reaction taking place in the cell.

'(##VPU_TTT_CHE_X_P01_C03_E06_002_Q01##)'



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37. Arrangement of displacement reaction is given in the picture. Here a metal rod is dipped in the salt solution of another metal. Equations of chemical reactions taking place here are given below.



a) Which is the metal rod used here?

b) If copper rod is used instead of the above metal rod, is displacement reaction possible?

Give reason

(hint: Order of reactivity of metals Ca > Mg >

Al > Zn > Fe > Cu) .



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38. Three different galvanic cells are illustrated below.

Hints: A, B and C are metals, the symbols are not real)

a) Identify the cathode in cell 1?

b) In cell 2, identify the electrode in which oxidation take place? Write the chemical equation this reaction.

c) Arrange the metals A, B and C in the decreasing order of their reactivity.

'(##VPU_TTT_CHE_X_P01_C03_E06_004_Q01##)'



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39. Complete the table

'(##VPU_TTT_CHE_X_P01_C03_E06_005_Q01##)'



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40. Take some $CuSO_4$ solution in a beaker Dip a iron rod in it: After sometime, colour change is observed.

a) Write the name of reaction.

b) Explain the reaction.

c) Write the chemical equation.



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41. Mg is react with HCl and Zn is react with H_2SO_4 . Answer the following Questions.

a) Write the chemical equation.

b) Which common nature of acid is show here.



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42. 5 ml, $AgNO_3$ is taken in a test tube and a copper rod is dipped in it.

a) Identify the changes occurring with the copper rod and the solution? .

b) Complete the equation of the reaction.

$Cu + 2AgNO_3$ gives ... +

c) Write the equations of the oxidation and reduction reactions.



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43. From the following which metal reacts with cold water?

(Zn, Cu, Mg, Na)



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44. What is obtained at the anode in the electrolysis of $CuSO_4$?



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45. Which is the electrolyte in Zn-Cu galvanic cell.



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46. Aluminium is reduced using electricity for its preparation. But gold which is seen in free form can be separated easily why?



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47. Find the relation and fill up suitably.

The reaction which gaining of electrons:

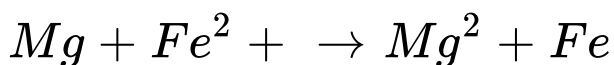
Reduction

The processes of losing of electrons :



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48. A redox reaction is given below.



If you arrange a galvanic cell based on this chemical reaction.

a) From which metal to which metal does the electrons, Flow?

b) Write the chemical equation occur at the negative electrode of the cell.



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49. Can we keep $FeSO_4$, solution in copper vessel? Why



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50. Sodium reacts with water.

a. Identify the gas evolved in the reaction.

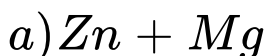
b. If two drops of phenolphthalein is added to the water, what will be colour change of the resultant solution?

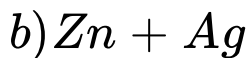
Explain the reason.



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51. Write the electron flow of following cells.





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52. a) When the aqueous solution of sodium chloride is subjected to electrolysis, what are the products obtained at each electrode.

b) Write the chemical equation occur at cathode?



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