



## CHEMISTRY

### BOOKS - A N EXCEL PUBLICATION

### REDOX REACTIONS

#### Question Bank

1. Calculate the oxidation number of underlined element in the following compound:



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2.

Calculate the oxidation number of Cr in  $K_2Cr_2O_7$  and P in  $H_2P_2O_5$ .

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3. Calculate the oxidation number of Cr in  $CrO_4^{2-}$

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4. Represent the following compounds using Stock notation :

$FeO$ ,  $Fe_2O_3$ ,  $CuO$ ,  $MnO$ ,  $MnO_2$ ,  $HAuCl_4$

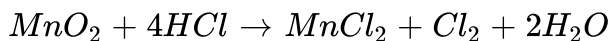
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5.  $2Na + H_2 \rightarrow 2NaH$ .

In this reaction ? Justify your answer.

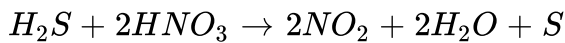
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6. Identify the oXIdant and reductant and the atoms undergoing oOXIdation and reduction in the following redox reactions.



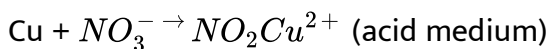
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7. Identify the oXIdant and reductant and the atoms undergoing oOXIdation and reduction in the following redox reactions.



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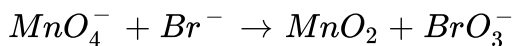
8. Balance the following equation using oOXIdation number method :



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9. Permanganate ion reacts with bromide ion in basic medium to give manganese dioxide and bromate ion. Write the balanced equation for the reaction using oxidation number method.

Skeletal equation is

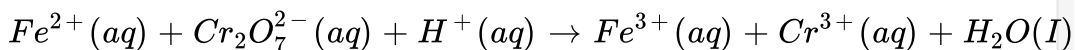


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10. Write balanced ionic equation for the reaction of  $\text{K}_2\text{Cr}_2\text{O}_7$  with  $\text{Na}_2\text{SO}_3$  in acidic medium to form chromium (III) ion and sulphate ion.

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11. Balance the following equation by the half reaction method.

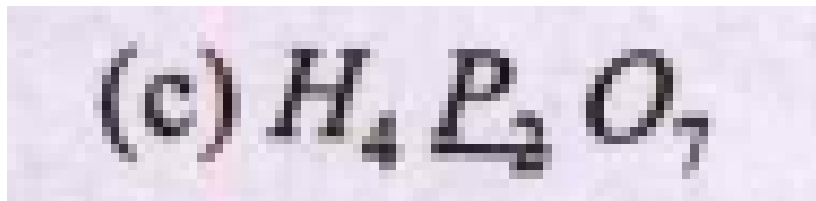


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12. Permanganate ion oxidises iodide to iodine in basic medium. Balance the equation.

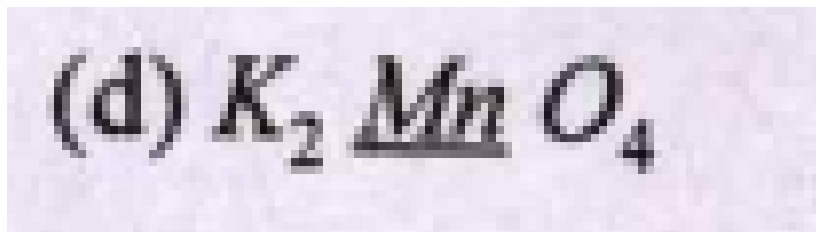
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13. Assign oxidation number to the underlined elements in each of the following species



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14. Assign oxidation number to the underlined elements in each of the following species



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15. Assign oxidation number to the underlined elements in each of the following species



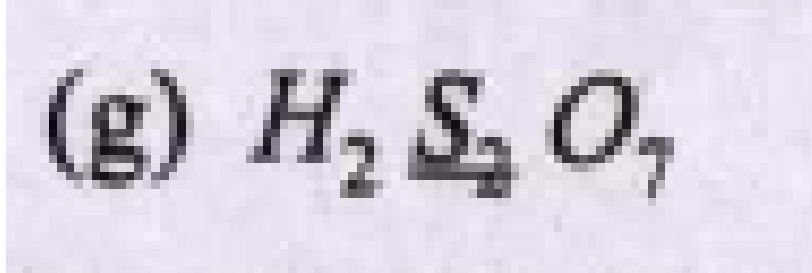
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16. Assign oxidation number to the underlined elements in each of the following species



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17. Assign oxidation number to the underlined element in the following species



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18. Assign oxidation number to the underlined elements in each of the following species



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19. What are the oxidation number of the underlined elements in each of the following and how do you rationalise the results ?



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20. What are the oxidation number of the underlined elements in each of the following and how do you rationalise the results ?



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21. What are the oxidation number of the underlined elements in each of the following and how do you rationalise the results ?



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22. What are the oxidation number of the underlined elements in each of the following and how do you rationalise the results ?



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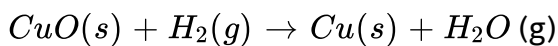


23. What are the oxidation number of the underlined elements in each of the following and how do you rationalise the results ?



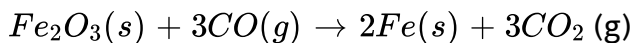
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24. Justify the given reaction is redox reaction



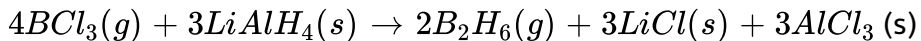
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25. Justify the following reaction is redox reaction



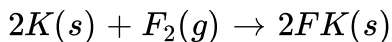
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26. Justify the following reaction is redox reaction



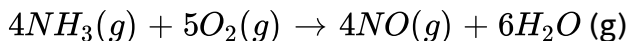
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27. Justify the given reaction is redox reaction



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28. Justify the following reaction is redox reaction



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29. Fluorine react with ice and results in the change



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30. Calculate the oxidation number of 's' in  $H_2SO_4$  ?

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31. Calculate the oxidation number of Cr in  $CrO_5$  .

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32. Calculate the oxidation number of N in  $NO_3^-$  .

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33. Write formulas for the following compounds:

a) Mercury (II) chloride

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**34.** Write the formula of the following compounds.

Nickel Sulphate

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**35.** Write the formula of the following compound.

Tin (IV) Oxide

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**36.** Write formula for the following compound:

Thallium (I) sulphate

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**37.** Write formula for the following compound:

Iron (III) Sulphate



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38. Write formula for the following compound:

Chromium (III) oxide



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39. While  $SO_2$  and  $H_2O_2$  act as oxidising as well as reducing agents in reactions,  $O_3$  and  $HNO_3$  act only as oxidants. Why?



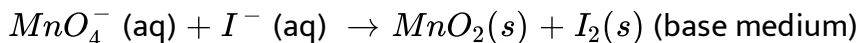
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40. The compound  $AgF_2$  is unstable. However, if formed, the compound acts as a very strong oxidizing agent. Why?



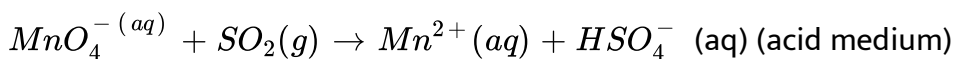
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**41.** Balance the following redox reaction by ion electron method



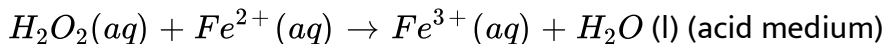
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**42.** Balance the following redox reactions by ion electron method



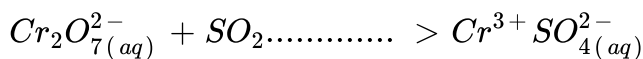
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**43.** Balance the following redox reaction by ion electron method



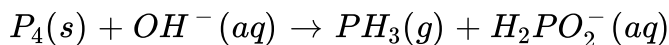
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**44.** Balance the following Redox reaction by ion-electron method or oxidation number method (Acid medium).



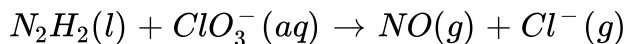
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**45.** Balance the equations in the basic medium by ion electron method and oxidation number methods. Identify the oxidant and reductant



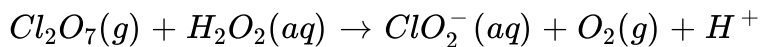
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**46.** Balance the equations in the basic medium by ion electron method and oxidation number methods. Identify the oxidant and reductant



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**47.** Balance the equations in the basic medium by ion electron method and oxidation number methods. Identify the oxidant and reductant



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**48.** Arrange the following in the order in which they displace each other from the solution of their salts. Al, Cu, Fe, Mg and Zn

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**49.** Given the standard electrode potentials

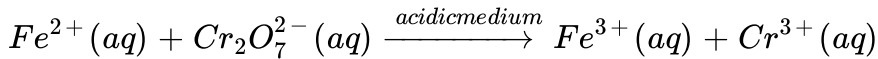
$$K^+ / K = -2.93V, Ag^+ / Ag = +0.8V, Hg^{2+} / Hg = 0.79V, Mg^{2+} / Mg = -2.37V$$

Arrange them in increasing order of reducing power.

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**50.** Chemical reactions which involve oxidation and reduction are called redox reactions. The unbalanced equation in the ionic form of a redox reaction is shown below

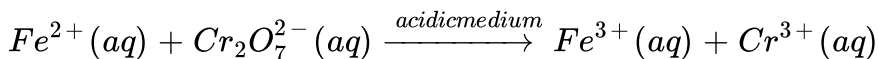




a) Identify the oxidizing agent in this reaction

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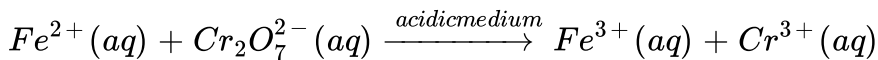
**51.** Chemical reactions which involve oxidation and reduction are called redox reactions. The unbalanced equation in the ionic form of a redox reaction is shown below



b) Name the species getting oxidized in the above reaction.

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**52.** Chemical reactions which involve oxidation and reduction are called redox reactions. The unbalanced equation in the ionic form of a redox reaction is shown below



c) Balance the above equation by the oxidation number method.

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**53.** A farmer prepared 1% solution of copper sulphate using iron rod as the stirrer for preparing Bordeaux mixture. Next day he notices that the blue color almost disappeared and the iron get coated with reddish brown material.

a) What is the reddish brown material deposited on the iron rod?



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**54.** A farmer prepared 1% solution of copper sulphate using iron rod as the stirrer for preparing Bordeaux mixture. Next day he notices that the blue color almost disappeared and the iron get coated with reddish brown material.

b) Account for the color change of the solution.



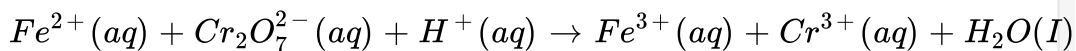
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55. A farmer prepared 1% solution of copper sulphate using iron rod as the stirrer for preparing Bordeaux mixture. Next day he notices that the blue color almost disappeared and the iron get coated with reddish brown material.

c) Justify that the above phenomenon is a redox reaction.

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56. Balance the following equation by the half reaction method.



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57. In redox reactions, oxidation and reduction occur simultaneously .

How are oxidation and reduction related to the oxidation number ?

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**58.** In redox reactions, oxidation and reduction occur simultaneously .

b) During a group discussion, one of your friends argues that thermal decomposition of  $KClO_3$  is a redox reaction while that of  $CaCO_3$  is not a redox reaction. Give your opinion and substantiate.

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**59.** Using stock notation, represent the following compounds. FeO and  $MnO_2$ .

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**60.** Redox reactions are those reactions in which oxidation and reduction takes place simultaneously. Write any two redox reactions.

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**61.** Competitive electron transfer reactions are utilized in the construction of Galvanic cells.

a) Write the redox reaction involved when metallic cobalt is placed in a nickle sulphate solution.

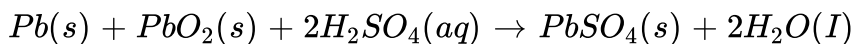
(Note: Only the ionic reaction is expected).



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**62.** Competitive electron transfer reactions are utilized in the construction of Galvanic cells.

b) In the reaction



identify the following

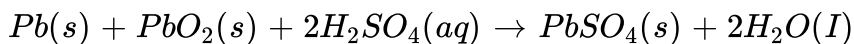
i) Substance oxidied



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**63.** Competitive electron transfer reactions are utilized in the construction of Galvanic cells.

b) In the reaction



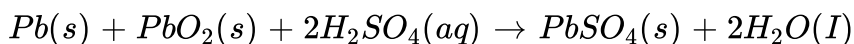
identify the following

ii) Substance reduced

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**64.** Competitive electron transfer reactions are utilized in the construction of Galvanic cells.

b) In the reaction



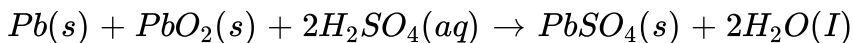
identify the following

iii) Oxidizing agent

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65. Competitive electron transfer reactions are utilized in the construction of Galvanic cells.

b) In the reaction



identify the following

iv) Reducing agent

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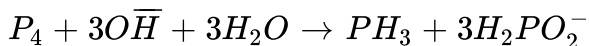
66. Calculate the oxidation number of Cr in  $Cr_2O_3$  and S in  $H_2SO_4$ .

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67. Calculate the oxidation number of 's' in  $H_2SO_4$  ?

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**68.** In disproportionation reaction an element in one oxidation state is simultaneously oxidised and reduced. Identify the element undergoing disproportionation in the following reaction



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**69.** Write the formula of the following compounds.

Nickel Sulphate

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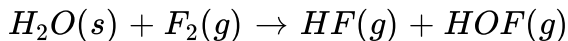
**70.** Write the formula of the following compound.

Tin (IV) Oxide

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71. Fluorine reacts with ice as given below:

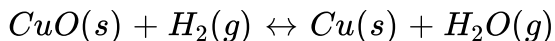


Justify that this is a redox reaction.



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72. Given the redox reaction:



i) Identify the species which undergo reduction and which undergo oxidation



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73. Given the redox reaction:



Identify the reductant and oxidant in the above reaction .



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74. Among the following reactions, identify the one which is NOT a redox reaction

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75. Among the following reactions, identify the one which is NOT a redox reaction

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76. Among the following reactions, identify the one which is NOT a redox reaction

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77. Among the following reactions, identify the one which is NOT a redox reaction





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78. Redox reactions can be considered as electron transfer reactions. In an experiment a copper rod is dipped in  $AgNO_3$  solution

What happens to the colour of the solution and why?



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79. Redox reactions can be considered as electron transfer reactions. In an experiment a copper rod is dipped in  $AgNO_3$  solution

Identify the oxidizing and reducing agent in this reaction .



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80.

Calculate the oxidation number of Cr in  $K_2Cr_2O_7$  and P in  $H_2P_2O_5$ .



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81.

Calculate the oxidation number of Cr in  $K_2Cr_2O_7$  and P in  $H_2P_2O_5$ .



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