



CHEMISTRY

BOOKS - MAXIMUM PUBLICATION

REDOX REACTIONS

Exemple

1. In which of the following, oxidation number of chlorine is +5?



Answer: D



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2. An oxidising agent is a substance which can

- A. Gain electrons
- B. Lose an electronegative radical
- C. Undergo decrease in the oxidation number of one of its atoms
- D. Undergo any one of the above change

Answer: D



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3. The arrangement of metals in the order of decreasing tendency to lose electrons is called ____



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4. When $KMnO_4$ reacts with acidified $FeSO_4$

- A. Only $FeSO_4$ is oxidised
- B. Only $KMnO_4$ is oxidised
- C. $FeSO_4$ is oxidised and $KMnO_4$ is reduced
- D. $KMnO_4$ is oxidised and $FeSO_4$ is reduced

Answer: C



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5. In the disproportionation reaction, which of the following statements is not true?

- A. The same species is simultaneously oxidised as well as reduced
- B. The reacting species must contain an element having at least three oxidation states

C. The element in the reacting species is present in the lowest oxidation state

D. The element in the reacting species is present in the intermediate oxidation state

Answer: C

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6. Find the oxidation state of oxygen in OF_2

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7. The oxidation numbers of chlorine atoms in bleaching powder is _____

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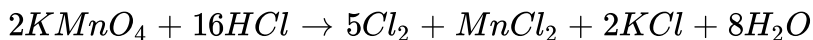
8. SO_2 can act as

- A. Oxidising agent only
- B. Reducing agent only
- C. Both oxidising and reducing agents
- D. Acid and a reducing agent only

Answer: C

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9. In the reaction



the reduction product is ____

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10. The strongest reducing agent is ____

A. K

B. Ba

C. Li

D. Na

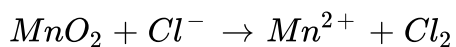
Answer: C

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11. Oxidation state of oxygen in H_2O_2 is _____

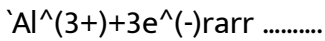
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12. Balance the following equation using oxidation number method:



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13. Complete the following ionic equations :

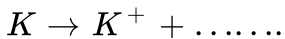


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14. Complete the following ionic equations : $\text{MnO}_4^{2-} \rightarrow \dots\dots\dots + \text{e}^{-}$

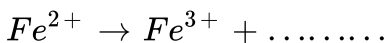
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15. Complete the following ionic equations :



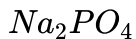
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16. Complete the following ionic equations :



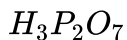
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17. Find the number of P in the following compounds:



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18. Find the number of P in the following compounds:



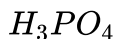
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19. Find the number of P in the following compounds:



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20. Find the number of P in the following compounds:





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21. Explain oxidation number and valency



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22. Some rules related to oxidation number are given below. Correct the mistake.

Oxidation number of alkali metals and alkaline earth metals is +2



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23. Some rules related to oxidation number are given below. Correct the mistake.

Oxidation number of hydrogen is always +1



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24. Some rules related to oxidation number are given below. Correct the mistake.

Algebraic sum of oxidation number of all the atoms in an ion is not equal to the charge on the ion

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25. Calculate the oxidation number of oxygen in OF_2 and KO_2

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26. When Zn rod is dipped in blue $CuSO_4$ solution the blue color of $CuSO_4$ fades due to displacement reaction. Write the reaction and identify the following:

i) The substance oxidised and the substance reduced .

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27. When Zn rod is dipped in blue $CuSO_4$ solution the blue color of $CuSO_4$ fades due to displacement reaction. Write the reaction and identify the following:

The oxidant and the reductant.

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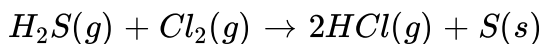
28. Calculate the oxidation number of C in CH_4 and in CH_3Cl

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29. The sum of oxidation numbers of all atoms in a neutral molecule is

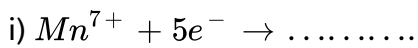
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30. Write the oxidation state of each element and identify the oxidising agent and reducing agent in the following reaction :



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31. Fill in the blanks and classy the following reactions into oxidation and reduction:



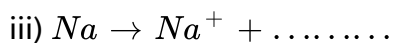
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32. Fill in the blanks and classy the following reactions into oxidation and reduction:



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33. Fill in the blanks and classify the following reactions into oxidation and reduction:



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34. Fill in the blanks and classify the following reactions into oxidation and reduction:



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35. Dihydrogen undergoes redox reactions with many metals at high temperature.

a) Write the reaction between hydrogen with sodium

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36. Dihydrogen undergoes redox reactions with many metals at high temperature.

b) Comment whether the product formed is covalent compound or ionic compound.

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37. Dihydrogen undergoes redox reactions with many metals at high temperature.

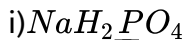
c) Which is the reducing agent in this reaction?

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38. Is it possible to keep copper sulphate solution in zinc pot? Why?

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39. Assign oxidation number of the underlined element.



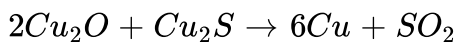
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40. Assign oxidation number of the underlined element.



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41. Identify the substance oxidised, reduced, oxidising agent and reducing agent in the reaction:



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42. Explain the following in term of electron transfer concept:

Oxidation

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43. Explain the following in term of electron transfer concept:

Reduction

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44. Explain the following in terms of electron transfer concept:

Oxidising agent

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45. Explain the following in terms of electron transfer concept:

Reducing agent





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46. Represent the following compound using Stock notation:



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47. Represent the following compound using Stock notation:



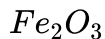
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48. Represent the following compound using Stock notation:



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49. Represent the following compound using Stock notation::



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50. Represent the following compound using Stock notation:



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51. In a redox reaction, oxidation and reduction occur simultaneously.

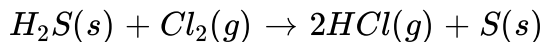
Write the classical concept of oxidation and reduction

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52. In a redox reaction, oxidation and reduction occur simultaneously.

b) Identify the species undergoing oxidation and reduction in the

following reaction :



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53. An equation is given below:



Find the oxidising agent and reducing agent .

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54. An equation is given below:



Balance the equation using half reaction method.

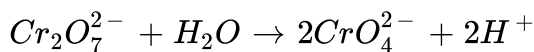
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55. Define redox reactions

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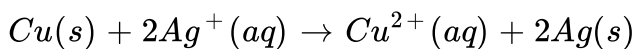
56. Predict whether the following reaction is a redox reactions or not?

Justify.



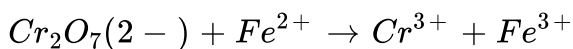
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57. Find out the oxidising agent and reducing agent in the following reaction:



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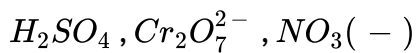
58. Balance the following redox reaction in acid medium using oxidation number method.



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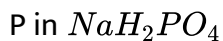
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59. Calculate the oxidation number of sulphur, chromium and nitrogen in



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60. Assign oxidation number.



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61. Assign oxidation number



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62. Assign oxidation number

B in $NaBH_4$

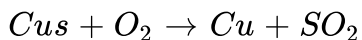
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63. Assign oxidation number

S in H_2SO_4

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64. Identify the oxidising and reducing agents in the reaction:



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65. A copper rod is dipped in silver nitrate solution.

a) What are the observations?



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66. A copper rod is dipped in silver nitrate solution.

Write the displacement reaction



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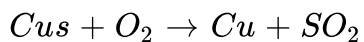
67. A copper rod is dipped in silver nitrate solution.

Identify the species getting oxidised and reduced.



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68. Identify the oxidising and reducing agents in the reaction:



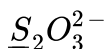
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69. Determine the oxidation number of the underlined element in the following:



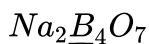
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70. Determine the oxidation number of the underlined element in the following:



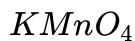
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71. Determine the oxidation number of the underlined element in the following:



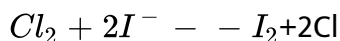
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72. Determine the oxidation number of the underlined element in the following:



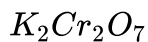
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73. Identify the substance oxidised, substance reduced, oxidising agent and reducing agent in the reaction:



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



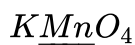
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75. Calculate the oxidation number of underlined element in the following compound:



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76. Determine oxidation number of the element underlined in each of the following.



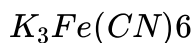
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77. Determine oxidation number of the element underlined in the following.



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78. Determine oxidation number of the element underlined in each of the following.



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79. Permanganate ion (MnO_4^-) reacts with bromide ion (Br^-) in basic medium to give manganese dioxide (MnO_2) and bromate ion (BrO_3^-)

a) Write the balanced ionic equation for this reaction.

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80. Permanganate ion (MnO_4^-) reacts with bromide ion (Br^-) in basic medium to give manganese dioxide (MnO_2) and bromate ion (BrO_3^-)

Identify the oxidising agent and reducing agent in this reaction .

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81. A redox reaction involves oxidation and reduction

a) What do you understand by electrode potential?

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82. A redox reaction involves oxidation and reduction

b) Define a redox couple.

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83. A redox reaction involves oxidation and reduction

Explain the set-up for Daniell cell with a diagram.

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84. A redox reaction involves oxidation and reduction

Write the electrode reactions and overall cell reaction which occur in the

Daniel cell.

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85. Redox reactions are those in which oxidation and reduction takes places. Explain the different types of redox reactions with suitable examples

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Exercise

1. Write formulas for the following compounds:

a) Mercury (II) chloride

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2. Write formula for the following compound:

Nickel (II) sulphate

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3. Write formula for the following compound:

Tin (IV) oxide

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4. Write formula for the following compound:

Thallium (I) sulphate

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5. Write formula for the following compound:

Iron (III) Sulphate





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6. Write formula for the following compound:

Chromium (III) oxide



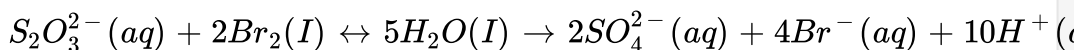
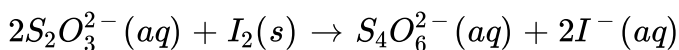
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7. The compound AgF_2 is unstable. However, if formed, the compound acts as a very strong oxidizing agent. Why?



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8. Consider the reactions:

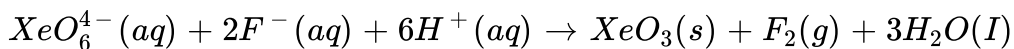


Why does the same reductant, thiosulphate react differently with iodine and bromine ?



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9. Why does the following reaction occur?



What conclusion about the compound Na_4XeO_6 (of which XeO_6^{4-} is a part) can be drawn from the reaction?

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10. Fill in the blanks.

The oxidation state of Cl in HClO_4 is

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11. Fill in the blanks.

A reducing agent is a substance which electrons in a chemical reaction.

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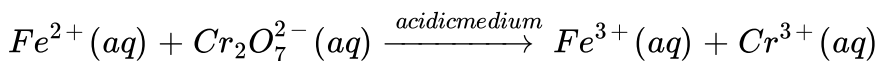
12. Fill in the blanks.

c) Among the elements Fluorine and Iodine exhibit both positive and negative oxidation states.



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13. 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



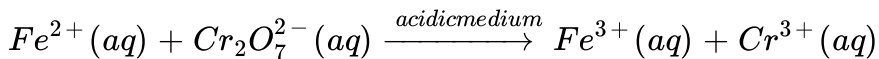
a) Identify the oxidizing agent in this reaction



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14. Chemical reactions which involve oxidation and reduction are called redox reactions. The unbalanced equation in the ionic form of a redox

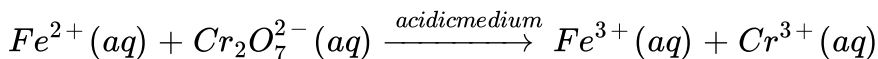
reaction is shown below



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

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15. 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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16. 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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17. 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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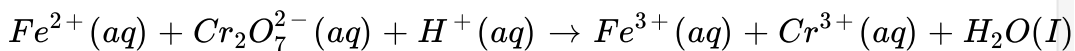
18. A farmer prepared 1% solution of copper sulphate using iron rod as the stirrer for preparing Bordeaux mixture. Next day he notices that the blue color almost disappeared and the iron get coated with reddish brown material.

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



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



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20. The chemical reactions taking place in electro chemical cells are redox reactions. In a Daniel cell,

a) As the reaction proceeds in this cell one of the metal rod gets dissolved in its solution and the other metal get deposited from the solution to the metal rod. Which metal is getting deposited?

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21. The chemical reactions taking place in electro chemical cells are redox reactions. In a Daniel cell,

b) Identify the metal which is acting as the oxidizing agent in this reaction .

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22. The chemical reactions taking place in electro chemical cells are redox reactions. In a Daniel cell ,

c) Write the chemical equation of the reaction taking place at anode.

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

How are oxidation and reduction related to the oxidation number ?

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24. 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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25. Using stock notation, represent the following compounds. FeO and MnO_2 .

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

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

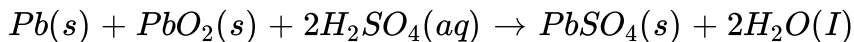
a) Write the redox reaction involved when metallic cobalt is placed in a nickle sulphate solution.

(Note: Only the ionic reaction is expected).

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

b) In the reaction



identify the following

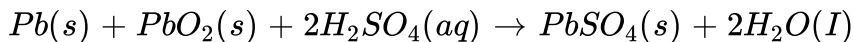
i) Substance oxidized



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

b) In the reaction



identify the following

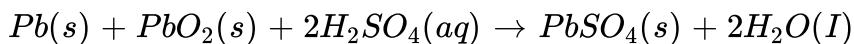
ii) Substance reduced



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

b) In the reaction



identify the following

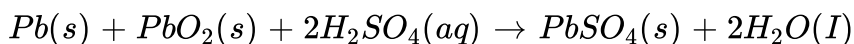
iii) Oxidizing agent



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

b) In the reaction



identify the following

iv) Reducing agent

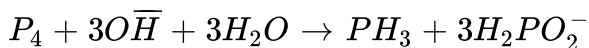


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32. Calculate the oxidation number of Cr in Cr_2O_3 and S in H_2SO_4 .

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

Nickel Sulphate

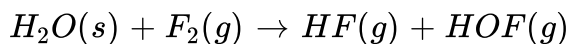
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35. Write the formula of the following compound.

Tin (IV) Oxide

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36. Fluorine reacts with ice as given below:



Justify that this is a redox reaction.

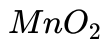
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37. Using stock notation, represent the following compound.

$HAuCl_4^-$

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38. Using stock notation, represent the following compound.

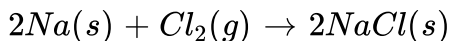


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39. Define the electronic concept of oxidation and reduction.

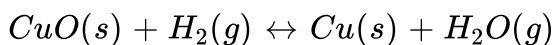
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40. Find out the oxidizer and reducer in the following reaction on the basis of the electronic concept



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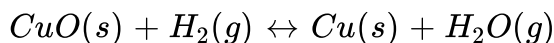
41. Given the redox reaction:



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

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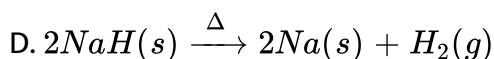
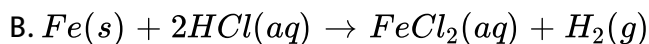
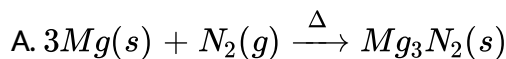
42. Given the redox reaction:



Identify the reductant and oxidant in the above reaction .

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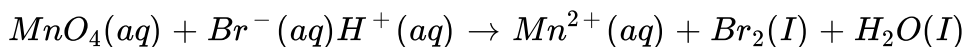
43. Among the following reactions, identify the one which is NOT a redox reaction



Answer:

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44. Identify the oxidant and reduction in the following ionic equation and balance it using oxidation number method



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45. 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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46. 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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47.

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

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48. In a redox reaction, reduction and oxidation takes place simultaneously.

a) Write the redox reaction in Daniell cell

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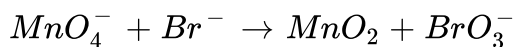
49. In a redox reaction, reduction and oxidation takes place simultaneously.

b) When $CuSO_4$ solution is stored in an iron vessel, the blue color changes to pale green. Do you agree with it? Justify.

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50. 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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