



CHEMISTRY

BOOKS - ARIHANT PUBLICATION

GROUP 16 ELEMENTS: OXYGEN FAMILY

Questions For Practice Multiple Choice Type
Questions

1. BaO_2 and ozone reacts to produce

A. Ba

B. Ba_2O_3

C. BaO

D. $Ba(OH)_2$

Answer: C



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2. A colourless gas with the smell of rotten fish

is

A. H_2S

B. PH_3

C. SO_2

D. None of these

Answer: A



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3. H_2S is passed through an acidified solution of copper sulphate and a black precipitate is formed. This is due to :

A. oxidation of Cu^{2+}

B. reduction of Cu^{2+}

C. oxidation of Cu^{2+} and then reduction

D. neither oxidation nor reduction of
 Cu^{2+}

Answer: D



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4. Oxygen is not evolved when ozone reacts with -

A. KI

B. SnCl_2

C. SO_2

D. I_2

Answer: B



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Questions For Practice Very Short Answer Type Questions

1. Group 16 elements are also called



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2. Account for the following:

Sulphur has a greater tendency for catenation than oxygen.



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3. Account for the following:

Oxygen shows catenation behaviour less than sulphur.



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4. How would you account for the following?

The electron gain enthalpy with negative sign is less for oxygen than that of sulphur.



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5. The thermal stability of the hydrides of group 16 down the group.



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6. Write the increasing order of thermal stability of hydrides of Gr-16 elements.



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7. Do as directed : H_2O , H_2S , H_2Se , H_2Te

(Increasing acidic strength)



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8. H_2O is a liquid while hydrogen sulphide is a gas at room temperature. Give reasons.



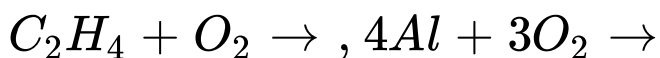
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9. Why hydrides of oxygen is a liquid whereas hydride of sulphur is a gas?



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10. Complete the following reactions:



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11. How would you account for the following?

The two O–O bond lengths in the ozone molecule are equal.



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12. Why does ozone act as a powerful oxidising agent?



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13. What is the action of O_3 on acidified $FeSO_4$ solution ?



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14. How the supersonic jet aeroplanes are responsible for the depletion of ozone layer?



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15. How is ozone estimated quantitatively?



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16. What is the shape of ozone molecule ?



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17. What happens when SO_2 is passed through an aqueous solution of Fe (III) salts?



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18. What happens when SO_2 gas is passed through acidified $K_2Cr_2O_7$ solution ?



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19. Why can't SO_2 be collected over water?



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20. Whether sulphur dioxide is a Lewis base or acid?



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21. Give one reaction in which SO_2 behaves as a reducing agent.



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22. How is SO_2 an air pollutant?



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23. What is sulphuric anhydride?



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24. Name one catalyst which is used in the manufacture of sulphuric acid by contact process.



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25. In the preparation of H_2SO_4 by contact process, why is SO_3 not absorbed directly in water to form H_2SO_4 ?



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26. Write the conditions to maximise the yield of sulphuric acid by contact process.



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Questions For Practice Short Answer Type I Questions

1. Why is oxygen a gas sulphur a solid at while room temperature ?



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2. There is a large difference between the melting and boiling points of oxygen and sulphur. Why?



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3. SF_6 is known but SCl_6 is not. Why?



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4. SF_6 is inert towards hydrolysis. Why?



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5. Out of H_2O and H_2S , which one has higher bond angle and why?



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6. What is the action of ozone with lead sulphide? Give equation.



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7. How does Ozone react with KI solution ?



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8. What happens when O_3 is passed through acidified $SnCl_2$ solution ?



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9. Why is ozone not collected over mercury?



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10. Complete the equation given below and make it a balanced equation



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11. What happens when SO_2 gas is passed through lime water first slowly and then in excess ?



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12. What happens when SO_2 is passed through sulphuretted-hydrogen dissolved in

water? Give equation.



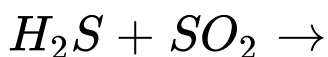
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13. Why hydrogen sulphide cannot be dried by conc. H_2SO_4 ?



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14. How do the following pairs of compounds react?





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15. What happens when Sulphur dioxide is passed through $FeCl_3$ solution ?



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16. Explain bleaching action of sulphur dioxide.



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17. How is the presence of SO_2 detected?



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18. Comment on the nature of two S-O bonds formed in SO_2 molecule. Are the two bonds in this molecule equal?



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19. What happens when potassium bromide is treated with warm conc. sulphuric acid?



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20. What happens when copper is heated with concentrated H_2SO_4 ? Give equation.



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21. Why is $K_{a2} < < K_{a1}$ for H_2SO_4 in water?



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22. Justify the placement of O, S, Se, Te and Po in the same group of the periodic table in terms of electronic configuration, oxidation state and hydride formation.



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23. A green coloured solution turns pink when ozone is bubbled through it. The pink colour

further decolourises when zinc and dil. H_2SO_4 are added to it. Identify the green and pink coloured compounds giving sequence of reactions.



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24. H_2S acts only as a reducing agent but SO_2 acts as a reducing as well as oxidising agent. Why?



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Questions For Practice Long Answer Type Questions

1. Name the elements of group VIA (oxygen family) of the periodic table. Give a comparative account of these elements.



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2. Discuss ozone reaction with I_2 , K_2MnO_4 and ethylene.



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3. How is ozone prepared? Show with equation
how does it react with KI solution?



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4. How is ozone prepared? Show with equation
how does it react with H_2O_2 and lead
sulphide?



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5. How ozone is prepared? How does it react with

(i) Potassium iodide solution?

(ii) $SnCl_2$ solution (acidified)?

Why the presence of ozone in the atmosphere is essential?



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6. Describe a method for the manufacture of ozone. Explain why ozone is not collected over mercury?

How does it react with (i) moist iodine and (ii) barium peroxide?



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7. How is sulphur dioxide prepared in the laboratory?



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8. How does sulphur dioxide react with (i) acidified $KMnO_4$ solution (ii) lime water and

(ii) ferric chloride?



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9. Give the laboratory method of preparation of SO_2 . How does it react with acidified $KMnO_4$ and $K_2Cr_2O_7$ solution? What is the cause of bleaching action of SO_2 ?



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10. Describe the laboratory method of preparation of sulphur dioxide. How does it react with acidified $KMnO_4$ solution and chlorine water ?



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11. Discuss the principle of manufacture of sulphuric acid by contact process. Why is H_2S not dried over concentrated H_2SO_4 ?

How does concentrated H_2SO_4 react with (i) copper and (ii) sugar?



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Odisha Bureau S Textbook Solutions A Multiple Choice Type Questions

1. Group 16 elements are

A. s-block elements

B. p-block elements

C. d-block elements

D. f-block elements

Answer: B



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2. Which of the following has the maximum catenation property?

A. S

B. Se

C. Po

D. Te

Answer: A



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3. Most abundant element in earth crust is

A. O

B. Se

C. Po

D. Te

Answer: A



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4. Sulphur molecule is

A. S_2

B. S_4

C. S_6

D. S_8

Answer: D



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5. Bleaching action of SO_2 is due to :

A. oxidation

B. reduction

C. hydrolysis

D. its acidic nature

Answer: B



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6. SO_2 oxidises

A. Mg

B. $K_2Cr_2O_7$

C. $KMnO_4$

D. All of these

Answer: A



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7. Which is not correct in case of H_2SO_4 ?

- A. Reducing agent
- B. Oxidising agent
- C. Sulphonating agent
- D. Highly viscous

Answer: A



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8. Which dissolves in H_2SO_4 to give oleum?

A. SO_2

B. SO_3

C. S_2O

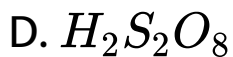
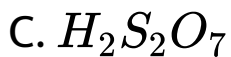
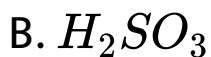
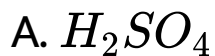
D. H_2S

Answer: B



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9. Oil of vitriol is



Answer: A



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10. Which of the following would quickly absorb oxygen?

A. Alkaline solution of pyrogallic acid

B. conc. H_2SO_4

C. Lime water

D. Alkaline solution of $CuSO_4$

Answer: A



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11. Oxygen will react with each of the following elements readily, except

A. P

B. Na

C. S

D. Cl

Answer: D



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12. O_3 reacts with KI solution to produce

A. Cl_2

B. I_2

C. IO_3

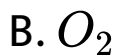
D. HI

Answer: B



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13. A gas which cannot be collected over water is

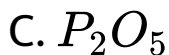
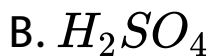


Answer: C



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14. When SO_2 is passed over which of the solution, it turns green

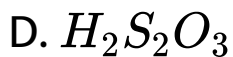


Answer: A



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15. Anhydride of H_2SO_4 is



Answer: C



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16. How many unpaired electrons are present in an atom of configuration $1s^2 2s^2 2p^4$

A. 2

B. 3

C. 1

D. 6

Answer: A



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17. SO_2 is dehydrated by

A. CaO

B. conc. H_2SO_4

C. P_2O_5

D. anhy. $CaCl_2$

Answer: B



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18. In which of the following reactions does SO_2 act as an oxidising agent?

A. Acidified $KMnO_4$

B. Acidified $K_2Cr_2O_7$

C. Acidified C_2H_5OH

D. H_2S

Answer: D



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19. Which will liberate H_2 gas from dil. H_2SO_4 ?

A. Cu

B. Al

C. ZnO

D. Ag

Answer: B



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20. The hybridisation of sulphur in H_2SO_4 is

A. sp

B. sp^2

C. sp^3

D. sp^3d^2

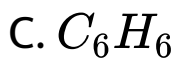
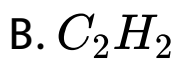
Answer: C



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21. Ozone reacts with

A. C_2H_4



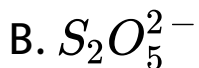
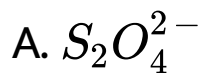
D. All of these

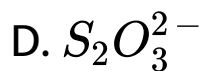
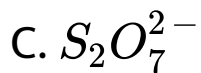
Answer: D



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22. There is no S-S bond in





Answer: C



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23. Formula of rhombic sulphur is



D. S_8

Answer: D



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24. Which oxide on heating gives oxygen

A. HgO

B. Na_2O

C. BaO

D. MgO

Answer: A



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25. Ozone is manufactured by

- A. Siemen's ozoniser
- B. Brodie's ozoniser
- C. Siemen's and malkes ozoniser
- D. All of the above

Answer: D



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26. The values of oxidation number of S in S_8 , S_2F_2 and H_2S are respectively.

A. -2, + 1 and -2

B. 0, + 1, -2

C. -2, -1 and + 2

D. 0, + 1, + 2

Answer: B



27. Ozone is tested by

A. Ag

B. Hg

C. Zn

D. Au

Answer: B



28. When SO_2 is passed through a solution of H_2S in water

- A. H_2SO_4 is produced
- B. H_2SO_3 is produced
- C. Sulphur precipitates is produced
- D. None of the above

Answer: C



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29. Which the following is known as king of chemicals?

A. Hg

B. HNO_3

C. Ni

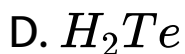
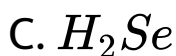
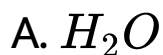
D. NH_4OH

Answer: A



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30. Which the following hydrides of oxygen family shows the lowest boiling point?



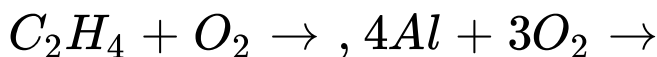
Answer: B



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Odisha Bureau S Textbook Solutions B Very Short Answer Type Questions

1. Complete the following reactions:



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2. Give one reaction in which SO_2 behaves as a reducing agent.



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3. What is the basicity of sulphuretted hydrogen?



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4. What happens when a paper soaked in lead acetate solution is shown in H_2S gas?



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5. Name one catalyst which is used in the manufacture of sulphuric acid by contact process.



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6. What is the action of SO_2 with H_2S ?



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7. Name two elements of group 16 of periodic table.



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8. Write the electronic configuration of second element of group VI-A of the periodic table.



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9. Write the allotropic forms of sulphur.



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10. What is the bond angle in the molecule of sulphur dioxide?



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11. Why SO_2 gas cannot be collected over water?



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12. What is the colour change observed when SO_2 is passed through acidified $K_2Cr_2O_7$ solution?



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13. Name one catalyst which is used in the manufacture of sulphuric acid by contact process.



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14. Which form of sulphur shows paramagnetic behaviour? What happens when SO_3 is passed through water?



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15. Conc. H_2SO_4 chars paper, wood and sugar because it removes from them.



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16. Which oxide of oxygen family is amphoteric in nature?



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17. Whether sulphur dioxide is a Lewis base or acid?



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18. What is the shape of ozone molecule ?



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Odisha Bureau S Textbook Solutions C Short Answer Type I Questions

1. What happens when SO_2 is passed through lime water? Give equations?



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2. Why oxygen is a gas, whereas sulphur is a solid?



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3. H_2O is a liquid while hydrogen sulphide is a gas at room temperature. Give reasons.



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4. What is the action of ozone with lead sulphide? Give equation.



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5. What happens when hydrogen peroxide reacts with ozone ? Give equation .

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6. What happens when H_2S is passed through aqueous solution of $ZnCl_2$? Give equation.

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7. What is allotropy ?





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8. Write with equation what happens when dilute sulphuric acid is added to sodium carbonate?



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9. Why hydrogen sulphide cannot be dried by conc. H_2SO_4 ?



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10. Why does sulphur dioxide exhibit bleaching action only in presence of water?



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11. What is the action of ozone on acidified ferrous sulphate? Give equation.



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12. What gas is produced when conc. H_2SO_4 reacts with common salt at room temperature? Write equation.



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13. Write the equation for the reaction that takes place in stages when solid NaCl is heated with conc. H_2SO_4 .



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14. Give one reaction in which SO_2 behaves as a reducing agent. Give equation.



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15. Why is ozone not collected over mercury?



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16. What happens when conc. H_2SO_4 is added to formic acid? Give equation.





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17. What happens when sulphuretted hydrogen is passed through chlorine water? Give equation.



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18. What is the action of conc. H_2SO_4 on potassium bromide? Give equation.



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19. Complete the equation given below and make it a balanced equation



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20. What happens when SO_2 is passed through sulphuretted-hydrogen dissolved in water? Give equation.



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21. Explain bleaching action of sulphur dioxide.



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22. Why does ozone act as a powerful oxidising agent?



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23. How is the presence of SO_2 detected?



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24. List the important sources of sulphur.



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25. H_2S is less acidic than H_2Te Why?



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26. How is SO_2 an air pollutant?



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27. What happens when SO_2 is passed through sulphuretted hydrogen dissolved in water? Give equation.



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28. Write the Lewis structure of sulphuric acid molecule.



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29. Write the structure and formula of Caro's acid.



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Odisha Bureau S Textbook Solutions D Short Answer Type Ii Questions

1. Write the conditions to maximise the yield of sulphuric acid by contact process.



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2. Arrange the hydrides of oxygen family in decreasing order of their bond angle? Explain.



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3. SF_6 exists while OF_6 does not. Explain.



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4. What happens when SO_2 gas is passed through lime water first slowly and then in

excess ?



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5. Explain that bleaching action of Cl_2 is permanent, while that of SO_2 is temporary.



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6. What are amphoteric oxides? Explain their amphoteric behaviour with suitable examples.



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7. What happens when ozone is passed through KI solution?



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Odisha Bureau S Textbook Solutions E Long Answer Type Questions

1. Write notes on preparation and any two properties and uses of SO_2 .





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2. How ozone is prepared? State three chemical properties.



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3. Group 16 elements are



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4. How is ozone prepared? Show with equation how does it react with H_2O_2 and lead sulphide?



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5. How is sulphur dioxide prepared in the laboratory?



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6. Discuss ozone reaction with I_2 , K_2MnO_4 and ethylene.



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7. Describe the laboratory method of preparation of sulphur dioxide. How does it react with acidified $KMnO_4$ solution and chlorine water ?



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8. How are the following prepared in the laboratory?



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9. How is SO_2 prepared in the laboratory?



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10. What happens when copper reacts with conc. H_2SO_4 ?



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11. What happens when Na_2CO_3 solution is evaporated with excess of SO_2 ?



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12. How ozone is prepared? How does it react with

(i) Potassium iodide solution?

(ii) SnCl_2 solution (acidified)?

Why the presence of ozone in the atmosphere is essential?



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13. How is ozone prepared? Show with equation how does it react with KI solution?



Chapter Practice Multiple Choice Type Questions

1. What happens when copper turnings are heated with conc. H_2SO_4 ?

A. H_2S

B. O_2

C. SO_3

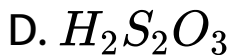
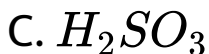
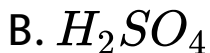
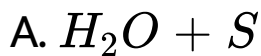
D. SO_2

Answer: D



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2. $SO_2 + H_2S \rightarrow$ Product. The final product is

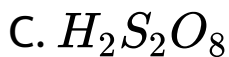
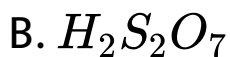
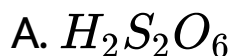


Answer: A



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3. Which of the following has S-S bond?



D. Mustard gas

Answer: A



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Chapter Practice Very Short Answer Type Questions

1. Bleaching action of SO_2 is due to :



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2. Name the elements of group 16 which show some metallic character along with non-

metallic character.



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3. Draw the structure of SO_3^{2-} .



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Chapter Practice Short Answer Type I Questions

1. Name the two most important allotropes of sulphur. Which one of the two is stable at

room temperature? What happens when the stable form is heated above 370 K?



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2. Write the chemical equation for reaction of water with an acidic oxide.



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3. Write the chemical equation for reaction of water with a basic oxide.



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4. Sulphur dioxide is more powerful reducing agent in an alkaline medium than in acidic medium. Why?



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5. What happens when sulphur dioxide reacts with oxygen in the presence of vanadium (V) oxide?



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Chapter Practice Short Answer Type Ii Questions

1. What happens when concentrated sulphuric acid is poured over sugar crystals?



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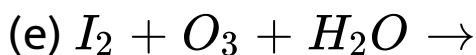
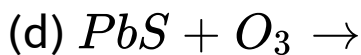
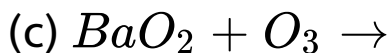
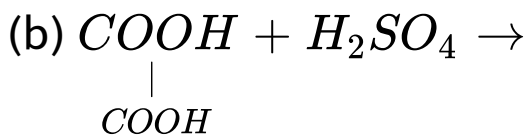
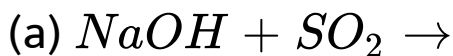
2. Draw the structure of sulphuric acid. Draw simple flow diagram of contact process for the manufacturing of sulphuric acid.



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Chapter Practice Long Answer Type Questions

1. Complete the following reactions:



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2. Draw resonance structure of O_3 .



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