



CHEMISTRY

BOOKS - MTG IIT JEE FOUNDATION

FOOTSTEPS TOWARDS CBSE BOARD

Section A

1. Name the process by which unsaturated fats are changed to saturated fats.



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2. Write the chemical reaction in which hydrogen peroxide acting as a reducing agent.



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3. 2 ml of sodium hydroxide solution is added to a few pieces of granulated zinc metal taken in a test tube. When the contents are warmed, a gas evolved which is bubbled through a soap

solution before testing.

Write the equation of the chemical reaction.



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4. 2 ml of sodium hydroxide solution is added to a few pieces of granulated zinc metal taken in a test tube. When the contents are warmed, a gas evolved which is bubbled through a soap solution before testing.

Write a test to detect the gas.



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5. 2 ml of sodium hydroxide solution is added to a few pieces of granulated zinc metal taken in a test tube. When the contents are warmed, a gas evolved which is bubbled through a soap solution before testing.

Name the gas which will be evolved when the same metal reacts with dilute solution of a strong acid.



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6. 2 ml of sodium hydroxide solution is added to a few pieces of granulated zinc metal taken in a test tube. When the contents are warmed, a gas evolved which is bubbled through a soap solution before testing.

What happens when CO_2 gas is passed through $NaOH$ solution?



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7. Write the electronic configuration of Ca.

Period No.	Element	Element
2	Li	Be
3	Na	Mg
4	K	Ca
5	Rb	Sr



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8. Predict the number of valence electrons in Rb.

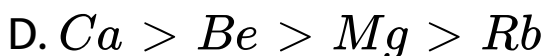
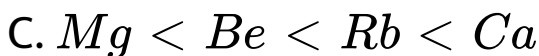
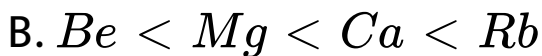
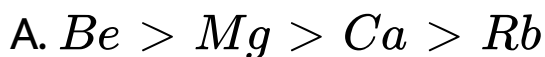
Period No.	Element	Element
2	Li	Be
3	Na	Mg
4	K	Ca
5	Rb	Sr



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9. Arrange Be,Ca,Mg and Rb in the increasing order of the size of their respective atoms.

Period No.	Element	Element
2	Li	Be
3	Na	Mg
4	K	Ca
5	Rb	Sr



Answer: B



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10. Which of the following statements is correct?

Period No.	Element	Element
2	Li	Be
3	Na	Mg
4	K	Ca
5	Rb	Sr

A. Among Li, Na, K and Rb strongest electropositive element is Li.

B. Be, Mg, Ca and Rb are the elements of same group.

C. Li, Na, K and Rb are the elements of same group

D. The number of valence electrons in Be and Mg is 3.

Answer: C



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11. Saponification means

- A. Acid hydrolysis
- B. alkaline hydrolysis
- C. Esterification
- D. Dehydration

Answer: B



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12. The sodium salt of a long chain carboxylic acid, possessing a cleansing property is

A. an ester

B. a detergent

C. a soap

D. a fat

Answer: C



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13. Formation of carbon disulphide from carbon and sulphur takes place by

- A. absorption of heat
- B. evolution of heat
- C. no change in heat content
- D. None of the above

Answer: A



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14. When two molecules of $NaOH$ react with one molecule of sulphuric acid, one molecule of and molecules of water are formed.

A. sodium sulphate, 2

B. sodium sulphite, 2

C. sodium sulphate, 1

D. sodium sulphite, 1

Answer: A



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15. Which of the following metals is obtained by electrolytic reduction process?

A. Fe

B. Cu

C. Ag

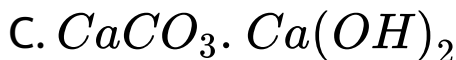
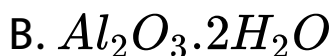
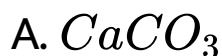
D. Al

Answer: D



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16. To which of the following ores , calcination process is not applicable



Answer: D



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17. An element X belongs to group 17 and 2nd period of the periodic table. Its atomic number will be

A. 9

B. 14

C. 7

D. 15

Answer: A



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18. The functional group present in butanone is

A. Carboxylic

B. Ketonic

C. Aldehydic

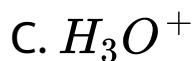
D. Alcoholic

Answer: B



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19. The species among the following which can act as an acid and as a base is

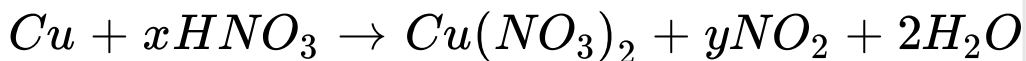


Answer: A



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20. In the balanced equation,



The values of x and y are

A. 3 and 5

B. 8 and 6

C. 4 and 2

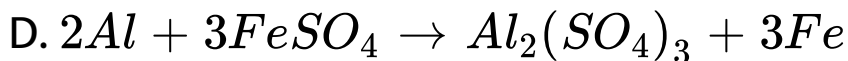
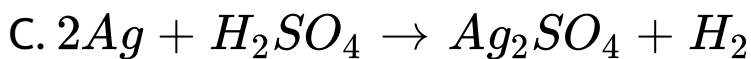
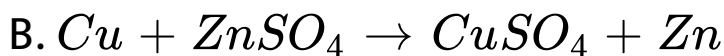
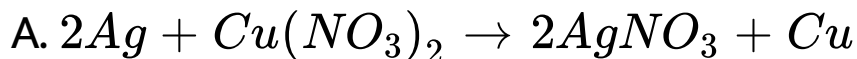
D. 7 and 1

Answer: C



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21. Which of the following reactions will occur?



Answer: D



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22. Assertion : Aluminium and bromine form $AlBr_3$ as a stable binary compound.

Reason : Aluminium is group 13 element while bromine is a group 17 element.

A. Both A and R are true and R is correct explanation of the assertion

B. Both A and R are true and R is not correct explanation of the assertion

C. A is true but R is false

D. A is false but r is true

Answer: B



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23. Assertion : Impure copper is purified by electro-refining.

Reason : copper is a good conductor of electricity.

A. Both A and R are true and R is correct explanation of the assertion

B. Both A and R are true and R is not correct explanation of the assertion

C. A is true but R is false

D. A is false but r is true

Answer: B



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Section B

1. A carboxylic acid $C_2H_4O_2$ reacts with an alcohol in the presence of H_2SO_4 to form a compound 'X'. The alcohol on oxidation with alkaline $KMnO_4$ following by acidification gives the same carboxylic acid, $C_2H_4O_2$. Write the name and structure of Carboxylic acid.



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2. A carboxylic acid $C_2H_4O_2$ reacts with an alcohol in the presence of H_2SO_4 to form a compound 'X'. The alcohol on oxidation with alkaline $KMnO_4$ following by acidification gives the same carboxylic acid, $C_2H_4O_2$. Write the name and structure of Alcohol.



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3. A carboxylic acid $C_2H_4O_2$ reacts with an alcohol in the presence of H_2SO_4 to form a compound 'X'. The alcohol on oxidation with alkaline $KMnO_4$ following by acidification gives the same carboxylic acid, $C_2H_4O_2$. Write the name and structure of

The compound 'X'.



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4. The following chemicals are available in a laboratory: Copper sulphate, Ferrous sulphate, Barium chloride, Sodium sulphate, Quick lime. Select the appropriate chemicals to study the following reactions :

Combination



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5. The following chemicals are available in a laboratory: Copper sulphate, Ferrous sulphate,

Barium chloride, Sodium sulphate, Quick lime.

Select the appropriate chemicals to study the following reactions :

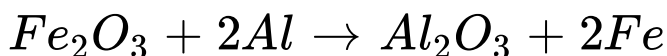
Decomposition.



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6. What is a reduction reaction?

Identify the substances that are oxidised and the substances that are reduced in the following reactions :

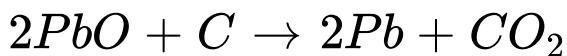




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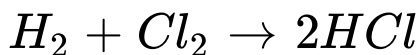
7. What is a reduction reaction?

Identify the substances that are oxidised and the substances that are reduced in the following reactions :



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8. Study the following chemical reaction and identify the type of reaction.



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9. Two elements M and N belong to group I and II respectively and are in the same period of the periodic table. How do the following properties of M and N vary ?

Sizes the their atoms



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10. Two elements M and N belong to group I and II respectively and are in the same period of the periodic table. How do the following properties of M and N vary ?

Their metallic characters



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11. Two elements M and N belong to group I and II respectively and are in the same period of the periodic table. How do the following

properties of M and N vary ?

Their valencies in forming oxides



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12. Compound 'A' when dissolved in water gives compound 'B' which is used in white washing. Compound 'B' reacts with CO_2 to form a white precipitate of compound 'C'. Identify compounds 'A', 'B' and 'C'. Also write the equations involved.



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13. What is indicated by:

Sooty flame



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14. What is indicated by:

Blue flame of a bunsen burner?



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15. Riya performs two set of experiments to study the length of the foam formed which are as follows:

Set I: she takes 10 ml of distilled water in test tube and adds 5-6 drops of liquid soap in it and shakes the test tube vigorously.

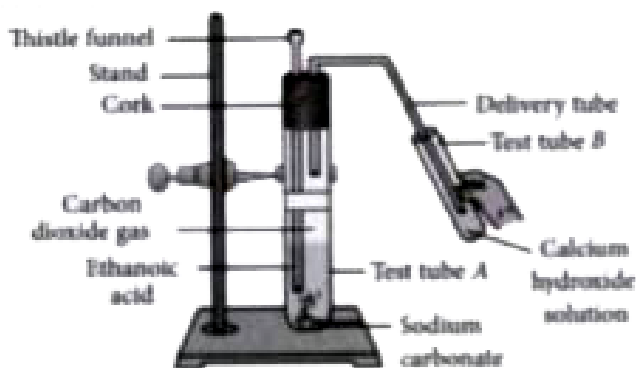
Set II : she takes 10 ml of distilled water in a test tube and adds 5-6 drops of liquid soap with half spoonful of $CaSO_4$ in it and shakes the test tube.

Write your observation and reason.



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16. Look at the figure shown and answer the following questions :

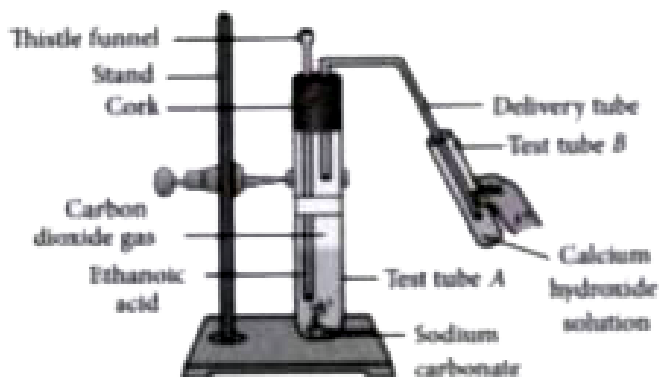


What change would you observe in the calcium hydroxide solution taken in test tube B?



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17. Look at the figure shown and answer the following questions :

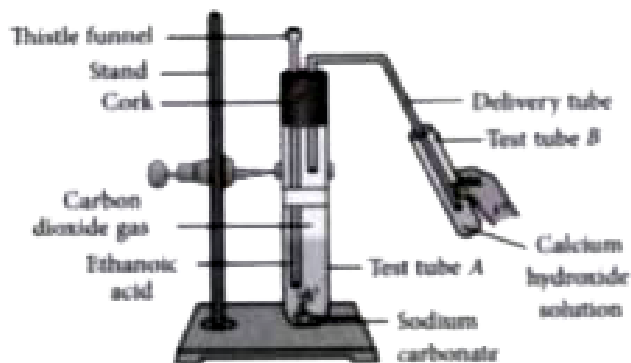


Write the reactions involved in test tubes A and B respectively.



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18. Look at the figure shown and answer the following questions :



If ethanol is given instead of ethanoic acid, would you expect the same change?



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19. A zinc plate was kept in a glass container having $CuSO_4$ solution. On examining it was found that the blue colour of the solution is getting fader and fader. After a few days when the zinc plate was taken out of the solution, a number of small holes were noticed in it. State the reason and give the chemical reactions involved.



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20. Name two metals with very low melting point.



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21. Name two metal oxides which are soluble in water.



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22. Metal compound (A) reacts with dilute hydrochloric acid to produce effervescence. The gas evolved extinguishes a burning candle. Write a balanced chemical equation for the reaction if one of the compound formed is calcium chloride.



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23. Write the balanced equation in molecular form illustrating the complete neutralization

of $Al(OH)_3$ with H_2SO_4 .



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24. Give reasons for the following:

Reaction of calcium with water is less violent.



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25. Give reasons for the following:

Prior to reduction, the metal sulphides and

carbonates must be converted into metal oxides for extracting metals.



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26. Classify the type of reaction used to determine relative reactivities of metals.



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27. Name three metals which occur in free state.



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28. Name two chlorides and two sulphates which are responsible for not giving foam with soap. How do you compare the cleansing capacity of different samples of water?



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29. (i) Electropositive nature of the element(s) increases down the group and decrease across

the period.

(ii) Electronegativity of the element decreases down the group and increases across the period.

(iii) Atomic size increases down the group and decrease across the period.

(iv) Metallic character increases down the group and decreases across the period.

On the basis of the above trends of the periodic table, answer the following about the elements with atomic number 3 to 9.

Name the most electronegative among them.



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30. (i) Electropositive nature of the element(s) increases down the group and decrease across the period.

(ii) Electronegativity of the element decreases down the group and increases across the period.

(iii) Atomic size increases down the group and decrease across the period.

(iv) Metallic character increases down the group and decreases across the period.

On the basis of the above trends of the

periodic table, answer the following about the elements with atomic number 3 to 9.

Name the element with smallest atomic size.



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31. (i) Electropositive nature of the element(s) increases down the group and decrease across the period.

(ii) Electronegativity of the element decreases down the group and increases across the period.

(iii) Atomic size increases down the group and decrease across the period.

(iv) Metallic character increases down the group and decreases across the period.

On the basis of the above trends of the periodic table, answer the following about the elements with atomic number 3 to 9.

Name the element which is a metalloid.



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32. Given below are some elements fo the modern periodic table. Atomic number of the element is given in the parentheses :

A(4), B(9), C(14), D(19), E(20).

Select the element that has one electron in the outermost shell. Also write the electronic configuration of that element.



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33. Given below are some elements fo the modern periodic table. Atomic number of the element is given in the parentheses :

A(4), B(9), C(14), D(19), E(20).

Which two elements amongst these belong to the same group? Give reason for your answer.



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34. Given below are some elements fo the modern periodic table. Atomic number of the

element is given in the parentheses :

A(4), B(9), C(14), D(19), E(20).

Which two elements amongst these belong to the same period?



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Section C

1. The members of alkene family are represented by the general formula C_nH_{2n} .

Now answer the following:

What do n and $2n$ signify?



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2. The members of alkene family are represented by the general formula C_nH_{2n} .

Now answer the following:

What is the molecular formula of alkene when $n = 6$?



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3. The members of alkene family are represented by the general formula C_nH_{2n} .

Now answer the following:

What is the molecular formula of the alkene if there are six H atoms in it?



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4. The members of alkene family are represented by the general formula C_nH_{2n} .

Now answer the following:

What is the molecular formula and structural

formula of the first member of the alkene family?



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5. The members of alkene family are represented by the general formula C_nH_{2n} .

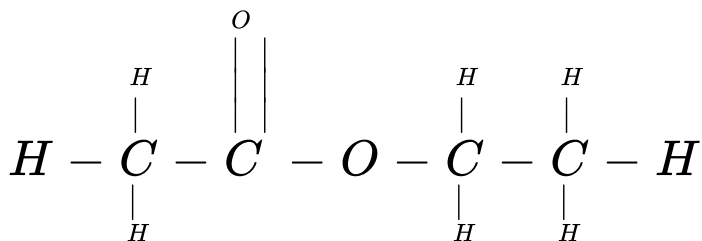
Now answer the following:

Write the molecular formula of lower and higher homologues of an alkene which contains four carbon atoms.



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6. The structural formula of an ester is



Write the structural formulae of the corresponding alcohol and the acid.



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7. How will you obtain

ethene from ethanol?



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8. $-CHO$ group cannot be present in the middle of a chain. Justify.



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9. Write the formulae of salts given below:

Potassium sulphate, sodium sulphate, calcium sulphate, magnesium sulphate, copper sulphate, sodium chloride, sodium nitrate, sodium carbonate, ammonium carbonate and

ammonium chloride.

Identify the acids and bases from which the above salts may be obtained .How many families can you identify among these salts?



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10. Identify the type of chemical reaction in the following statement and explain each of them :

Digestion of food in our body.



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11. Identify the type of chemical reaction in the following statement and explain each of them

:

Rusting of iron



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12. Identify the type of chemical reaction in the following statement and explain each of them

:

Heating of manganese dioxide with aluminium powder.



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13. Identify the type of chemical reaction in the following statement and explain each of them :

Blue colour of copper sulphate solution disappears when iron fillings are added to it.



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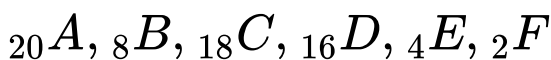
14. Identify the type of chemical reaction in the following statement and explain each of them :

Dilute hydrochloric acid is added to sodium hydroxide solution to form sodium chloride and water.



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15. Consider the following elements :



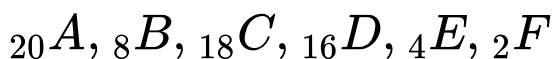
Answer the following giving reasons :

Which of the above elements you would expect to be very stable



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16. Consider the following elements :



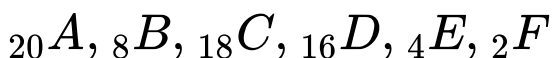
Answer the following giving reasons :

Which of the above elements you would expect to be in group 2 of the periodic table.



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17. Consider the following elements :



Answer the following giving reasons :

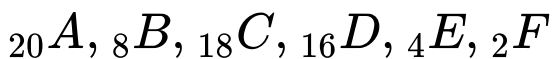
Which of the above elements you would expect to be

in group 16 of the periodic table?



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18. Consider the following elements :



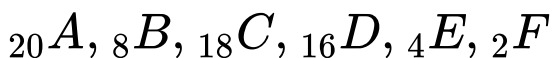
Answer the following giving reasons :

What type of bond will be formed when the element A reacts with B? Explain.



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19. Consider the following elements :



Answer the following giving reasons :

Which of the given elements is (are) called noble gas?



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20. Read the following statements and identify the elements :

An element with atomic number 12 and forms XCl_2 type of compounds



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21. Read the following statements and identify the elements :

Metal used in making cans and member of group 14.



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22. Read the following statements and identify the elements :

A lustrous non-metal which has 7 electrons in its outermost shell.





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23. Read the following statements and identify the elements :

Highly reactive and soft metal which imparts yellow colour when subjected to flame and is kept in kerosene.



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24. Read the following statements and identify the elements :

The first element of second period.



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25. Read the following statements and identify the elements :

An element which is used in making fluorescent bulbs and is second member of group 18 in the modern periodic table.



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26. Read the following statements and identify the elements :

A radioactive element which is the last member of halogen family.



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27. Read the following statements and identify the elements :

Metal which is an important constituent of

steel and forms rust when exposed to moist air.



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28. Read the following statements and identify the elements :

The first metalloid in Modern Periodic Table whose fibres are used in making bullet-proof vests.



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29. Read the following statements and identify the elements :

An element of group 15 and period 5 and also a semi-metal.



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30. How can you test the metal oxides are basic while non metal oxides are acidic. Explain with one example in each case.



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31. Name one oxide which is both acidic as well as basic. What are these oxides called ?



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32. State the chemical property in each case on which the following uses of baking soda are based :

As an antacid.



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33. State the chemical property in each case on which the following uses of baking soda are based :

As a constituent of baking powder.



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34. Name the metal which is low in activity series and exist as liquid at room temperature.



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35. Write the name and formula of an ore of mercury.



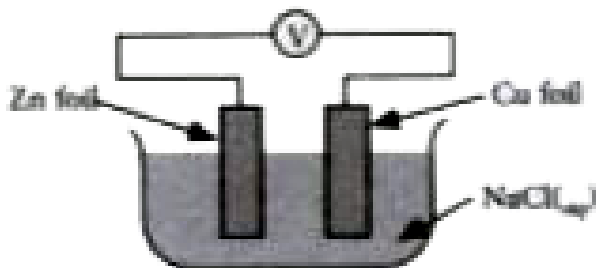
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36. How is the metal extracted from this ore?
Write the chemical equation for the reaction involved.



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37. The diagram shows set up for a simple experiment.

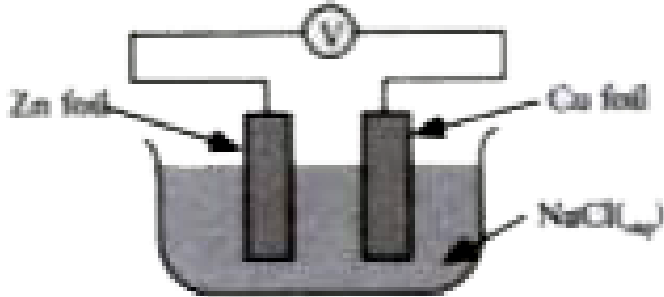


Describe the reactions taking place at

The zinc electrode.

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38. The diagram shows set up for a simple experiment.



Describe the reactions taking place at

The copper electrode.

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39. What is meant by refining of metals? Name the most widely used method of refining impure metals produced by various reduction processes. Describe with the help of a labelled

diagram. How this method may be used for refining a copper.



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