



# CHEMISTRY

## BOOKS - NAND LAL PUBLICATION

### METALS AND NON-METALS

#### Intext Questions

1. Why is sodium kept immersed in kerosene oil?



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2. Write equation for the reactions of :

iron with steam



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3. Write equations for the reactions of  
:calcium and potassium with water.



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4. Samples of four metals A,B,C and D were taken and added to the following solution one by one. The results obtained have been tabulated as follows.

Metal	Iron (II) sulphate	Copper (II) sulphate	Zinc sulphate	Silver nitrate
A	No reaction	Displacement		
B	Displacement	No reaction		
C	No reaction	No reaction	No reaction	Displacement
D	No reaction	No reaction	No reaction	No reaction

Use the table above to answer the question about metals A, B, C

and D: Arrange the metals A, B, C and D. in the order of decreasing reactivity.



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5. Samples of four metals A,B,C and D were taken and added to the following solution one by one. The results obtained have been tabulated as follows.

<b>Metal</b>	<b>Iron (II) sulphate</b>	<b>Copper (II) sulphate</b>	<b>Zinc sulphate</b>	<b>Silver nitrate</b>
<b>A</b>	No reaction	Displacement		
<b>B</b>	Displacement	No reaction		
<b>C</b>	No reaction	No reaction	No reaction	Displacement
<b>D</b>	No reaction	No reaction	No reaction	No reaction

Use the table above to answer the question about metals A, B, C

and D: What would you observe if B is added to a solution of Copper (II) sulphate ?



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6. Samples of four metals A,B,C and D were taken and added to the following solution one by one. The results obtained have been tabulated as follows.

Metal	Iron (II) sulphate	Copper (II) sulphate	Zinc sulphate	Silver nitrate
A	No reaction	Displacement		
B	Displacement	No reaction		
C	No reaction	No reaction	No reaction	Displacement
D	No reaction	No reaction	No reaction	No reaction

Use the table above to answer the question about metals A, B, C

and D: Arrange the metals A, B, C and D. in the order of decreasing reactivity.



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7. Which gas is produced when dilute hydrochloric acid is added to a reactive metal ? Write the chemical reaction when iron reacts with dilute  $H_2SO_4$ .



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8. What would you observe when zinc is added to a solution of iron sulphate? Write the chemical reaction that takes place.



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9. Write the electron-dot structures for sodium, Oxygen and magnesium.



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10. Show the formation of  $Na_2O$  and  $MgO$  by the transfer of electrons.

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11. What are the ions present in these compounds?

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12. Why do ionic compounds have high melting points?





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**13. Define the following terms :**

Minerals



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**14. Define the following terms :**

Ore



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**15.** Define the following terms :

Gangue.



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**16.** Name two metals which are found in nature the free state.



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17. What chemical process is used for obtaining a metal from its oxide?



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18. Metallic oxides of zinc, magnesium and copper were heated with the following :

Metal	Zinc	Magnesium	Copper
Zinc oxide			
Magnesium oxide			
Copper oxide			

in which

cases will you find displacement reactions taking place?



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**19.** Which metals do not corrode easily?



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**20.** What are alloys?



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**Exercises**

1. Which of the following pairs will give displacement reactions:

A. NaCl solution and copper metal

B.  $MgCl_2$  solution and aluminum metal

C.  $FeSO_4$  solution and silver metal

D.  $AgNO_3$  solution and copper metal

**Answer: d**



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2. Which of the following methods is suitable for preventing an iron frying pan from rusting:

- A. applying grease
- B. applying paint
- C. applying a coating of zinc
- D. all of the above

**Answer: c**



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3. An element reacts with oxygen to give a compound with a high melting point. This compound is also soluble in water. The element is likely to be:

A. calcium

B. carbon

C. silicon

D. iron

**Answer: a**



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4. Food cans are coated with tin and not with zinc because:

- A. zinc is costlier than tin
- B. zinc has a higher melting point than tin
- C. zinc is more reactive than tin
- D. zinc is less reactive than tin

**Answer: c**



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5. You are given a hammer, a battery, a bulb, wires and a switch. How could you use them to distinguish between samples of metals and non-metals?



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6. You are given a hammer, a battery, a bulb, wires and a switch. How could you use them to distinguish between samples of metals and non-metals?



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7. What are amphoteric oxides? give two examples of amphoteric oxides?



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8. Name two metals which will displace hydrogen from dilute acids, and two metals which will not



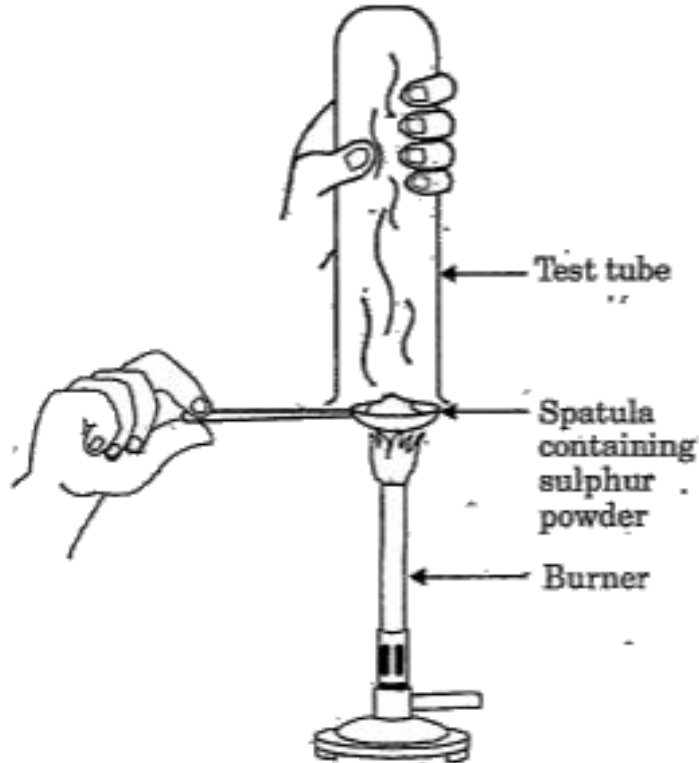
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**9.** In the electrolytic refining a metal M what would you take as the anode, cathode and electrolyte?



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**10.** Pratyush took sulphur powder on a spatula and heated it. He collected the gas evolved by invert a test tube over it, as shown in the figure below:



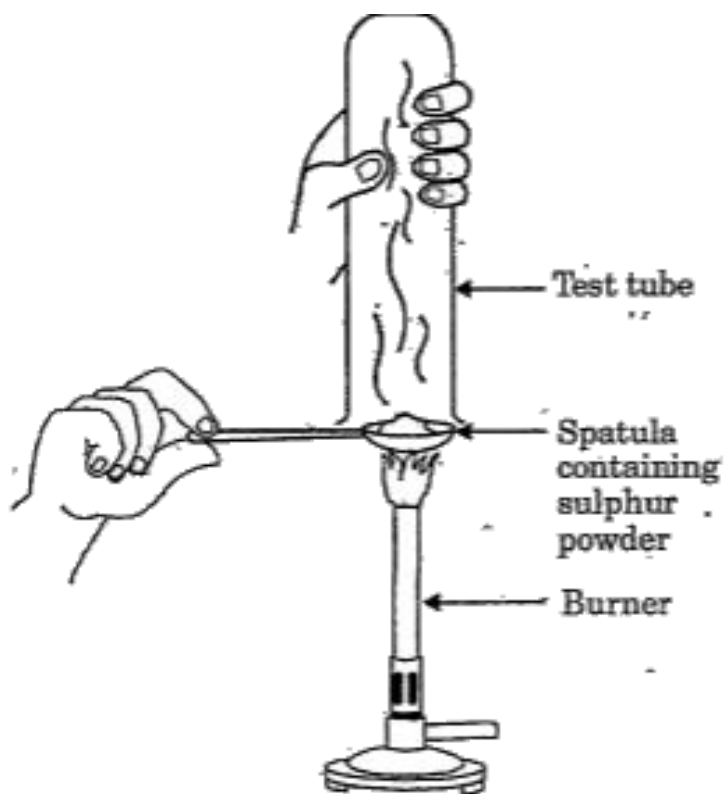
*Collection of gas*

What will be the action of gas on :  
dry litmus paper ?



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11. Pratyush took sulphur powder on a spatula and heated it. He collected the gas evolved by inverting a test tube over it, as shown in the figure below:



*Collection of gas*

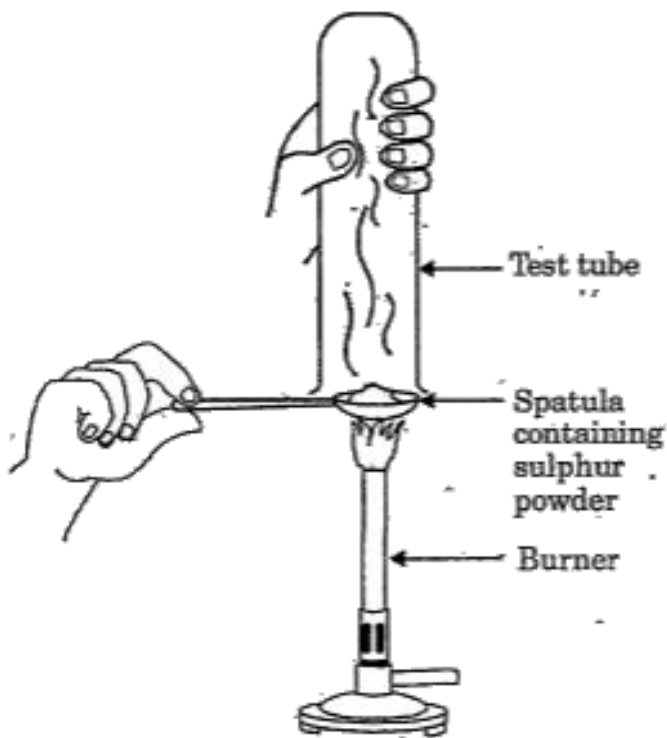
What will be the action of gas on :

moist litmus 'paper ?



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**12.** Pratyush took sulphur powder on a spatula and heated it. He collected the gas evolved by invert a test tube over it, as shown in the figure below:



*Collection of gas*

Write a balanced chemical equation for reaction taking place.



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**13.** State two ways to prevent the rusting of iron



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**14.** What type of oxides are formed when non-metals combine with oxygen?



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**15.** Give reasons: Platinum, gold and silver are used to make jewellery



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**16.** Give reasons: sodium, potassium and lithium are stored under oil.



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**17.** Give reasons: aluminium is highly reactive metal, yet it is used to make utensils for cooking.



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**18.** Give reasons: Carbonate and sulphide ores are usually converted into oxides during the process of extraction



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**19.** You must have seen tarnished copper vessels being cleaned with lemon or tamarind juice. explain why these sour substances are effective in cleaning the vessels.



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**20.** Differentiate between metals and non-metals on the basis of their chemical properties



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21. A man went door to door posing as a goldsmith he promised to bring back the glitter of old and dull gold ornaments an unsuspecting lady gave a set of gold bangles to him which he dipped in a particular solution the bangles sparkled like new but their weight was reduced drastically the lady was upset but after a futile argument the man beat a hasty retreat can you play the detective to find out the nature of the solution he had used?



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22. Give the reason why copper is used to make hot water tanks but steel (an alloy of iron) is not.



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## Additional Questions

1. What happens when iron is heated to a high temperature?



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2. What happens when copper is heated to a very high temperature?



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3. Write an experiment to show that copper does not react with dilute  $HCl$  and  $H_2SO_4$ .



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4. Write the physical properties of metals.



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### Activity 3 1

1. Take samples of iron, copper, aluminium and magnesium. Note the appearance of each sample.



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2. Clean the surface of each sample by rubbing them with sand paper and note their appearance again.



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## Activity 3 2

1. Take small pieces of iron, copper, aluminium and magnesium. Try to cut these metals with a sharp knife and note your observation.



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2. Hold a piece of sodium metal with a pair of tongs. CAUTION: Always handle sodium metal with a care. Dry it by pressing between the folds of a filter paper. Put it on a watch-glass and try to cut it with a knife. What do you observe?



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Activity 3 3

1. Take pieces of iron, zinc, lead and copper. Place any one metal on a block of iron and strike it four or five times with a hammer. What do you observe. Repeat with other metals. Record the change in the shape of these metals.



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**Activity 3 4**

1. List the metals whose wires you have seen in daily life



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### Activity 3 8

1. Is the product formed on burning magnesium acidic or basic?



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2. is the product formed on burning sulphur acidic or basic?



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3. Can you write equations for these reactions?



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