

# Metals and Non-metals

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16. Write one example of each of the following:

- (a) A metal and a non-metal which are liquids at room temperature.
- (b) A metal which is very soft and a non-metal which is very hard.
- (c) A metal which has very low melting point and a non-metal which has very high melting point.

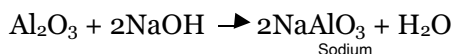
2014/2015/2016 [3 Marks]

- (a) Liquid metal – Mercury, Liquid non-metal – Bromine.
  - (b) Soft metal – Sodium, Hard non-metal – Diamond.
  - (c) Metal with very low melting point - Mercury, Non-metal with very high melting point – Tungsten.
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17. Metal oxides are basic in nature. But some metal oxides show both acidic as well as basic behaviour. What are these oxides called? Name one such oxide and write its reaction with an acid and a base.

2014/2015/2016 [2 Marks]

- Oxides which show acidic as well as basic behavior are called amphoteric oxides.
- Example:  $\text{Al}_2\text{O}_3$ ,  $\text{ZnO}$ . (*Any one*)
- $\text{Al}_2\text{O}_3 + 6\text{HCl} \rightarrow 2\text{AlCl}_3 + 3\text{H}_2\text{O}$



Sodium  
Meta aluminate

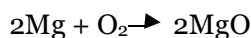
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18. (a) Support your answer with chemical equations in each case. What happens when magnesium ribbon is burnt in air? What is the state of the metal oxide in the product formed?

- (b) An element A forms two oxides AO and  $\text{AO}_2$ . The oxide AO is neutral whereas the oxide  $\text{AO}_2$  is acidic in nature. Would you call element A a metal or a non-metal?

2014/2015/2016 [3 Marks]

(a) When magnesium ribbon is burnt in air, it produces dazzling light and a white coloured magnesium oxide is formed.



Metal oxide is basic in nature and its state is solid.

(b) A is a non-metal because non-metal oxides are acidic or neutral in nature.

AO = CO (Carbon monoxide) – Neutral oxide

$\text{AO}_2 = \text{CO}_2$  (Carbon dioxide) – Acidic oxide

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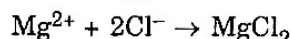
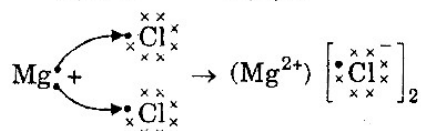
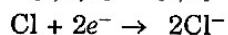
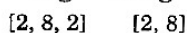
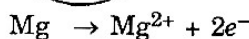
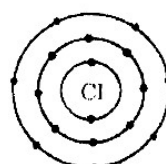
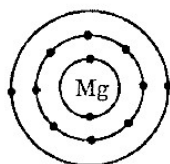
19. (a) Show the formation of  $\text{MgCl}_2$  by the transfer of electrons.

(b) What kind of compound is  $\text{MgCl}_2$ ? Hard or soft? Why?

(c) Comment on its solubility in water and its conductivity.

2010/2011/2012/2013 [3 Marks]

(a)



(b)  $\text{MgCl}_2$  will be hard because of the strong force of attraction between the positive and negative ions.

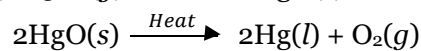
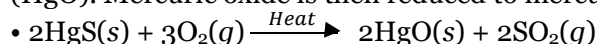
(c) • It is soluble in water.

• Solid  $\text{MgCl}_2$  does not conduct electricity but its aqueous solution does conduct electricity.

20. Describe briefly the method to obtain mercury from cinnabar. Write the chemical equation for the reactions involved in the process.

2013/2014/2016 [2 Marks]

• When cinnabar is heated in air, it is first converted into mercuric oxide ( $\text{HgO}$ ). Mercuric oxide is then reduced to mercury on further heating.



21. Define the terms:

(i) Mineral, (ii) Ore, (iii) Gangue.

2010/2015/2016 [3 Marks]

(i) **Mineral:** A natural material present in earth crust in which metal occurs is called mineral.

(ii) **Ore:** A mineral from which metal can be extracted profitably is known as an ore.

(iii) **Gangue:** Impurities of sand and rocky material present in ore are called gangue.

22. (a) Given below are the steps for extraction of copper from its ore. Write the reaction involved.

(i) Roasting of copper (I) sulphide.

(ii) Reduction of copper (I) oxide with copper (I) sulphide.

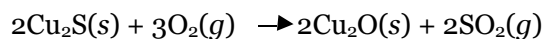
(iii) Electrolytic refining.

(b) How is impure copper purified by electrolytic refining? Draw a labeled diagram.

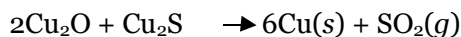
2010/2011/2012/2013/2016 [5 Marks]

(i) Following are the steps for extraction of copper (Metal 'X') from its ore:

(a) Roasting of copper (I) sulphide:

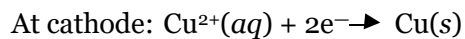
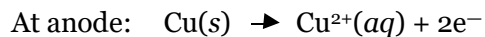


(b) Reduction of copper (I) oxide with copper (I) sulphide:



This reaction is known as auto-reduction.

(c) Electrolytic refining of copper:



(ii) **Electrolytic refining of copper:** The electrolyte is a solution of acidified copper sulphate. The anode is impure copper, whereas the cathode is a strip of pure copper. On passing electric current, pure copper is deposited on the cathode.

