

GRADE 10<sup>TH</sup> SCIENCE  
CHAPTER 2

# ACIDS BASES AND SALTS

 [www.careerplusacademy.com](http://www.careerplusacademy.com)  [careerplusacademy@gmail.com](mailto:careerplusacademy@gmail.com)

 [/careerplusacademy](https://www.facebook.com/careerplusacademy)  [/in/sarabkaur](https://www.linkedin.com/in/sarabkaur)  [/careerplusacademy](https://www.youtube.com/careerplusacademy)  +91-987-111-5373

For Online Tutorials, Subscribe  /careerplusacademy

2

Read the following and answer any four questions from 2(i) to 2(v).

A compound, X of sodium forms a white powder. It is a constituent of baking powder and is used in some antacids. When heated it gives a compound, Y which is anhydrous and absorbs water to become a hydrated salt. When this salt is kept in open air, it loses water molecules in a process called efflorescence. When dissolved in water it forms a strong base and a weak acid, Z.

- (i) What is the compound, X?  
(a)  $\text{NaHCO}_3$                       (b)  $\text{Na}_2\text{CO}_3$                       (c)  $\text{NaOH}$                       (d)  $\text{NaCl}$
- (ii) The compound, Y is  
(a)  $\text{NaHCO}_3$                       (b)  $\text{Na}_2\text{CO}_3$                       (c)  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$                       (d)  $\text{NaCl}$
- (iii) What is the nature of the solution formed by dissolving Y in water?  
(a) Alkaline                      (b) Acidic                      (c) Neutral                      (d) It remains insoluble.
- (iv) Identify the compound, Z.  
(a)  $\text{CO}_2$                       (b)  $\text{H}_2\text{CO}_3$                       (c)  $\text{NaOH}$                       (d)  $\text{H}_2\text{O}$
- (v) Sodium carbonate is a basic compound because it is a salt of a  
(a) strong acid and strong base                      (b) weak acid and weak base  
(c) strong acid and weak base                      (d) weak acid and strong base.

3

Read the following and answer any four questions from 3(i) to 3(v).

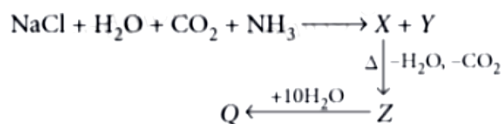
Sodium chloride obtained from sea water or from lakes contains many impurities such as sulphates of sodium and magnesium along with chlorides of calcium and magnesium. The chlorides of calcium and magnesium are particularly undesirable on account of their deliquescent nature.

For its purification, common salt is dissolved in minimum quantity of water to get a saturated solution from which insoluble impurities are filtered off. Then hydrogen chloride gas is passed through the saturated solution and the crystals of pure  $\text{NaCl}$  separate out. The soluble impurities remain in the mother liquor. The crystals are filtered, washed and dried.

- (i) Select the correct statement regarding salt  $\text{NaCl}$ .  
(a) Pure  $\text{NaCl}$  is hygroscopic in nature.  
(b) It is soluble in alcohol.  
(c) Pure  $\text{NaCl}$  is not hygroscopic, it shows hygroscopic nature due to impurities.  
(d) It is a brown crystalline solid.
- (ii) Nature of aqueous solution of common salt is  
(a) acidic                      (b) alkaline                      (c) basic                      (d) neutral.

For Online Tutorials, Subscribe  /careerplusacademy

(iii) In the given series of reactions, Y and Z respectively are



(Q is used in removing permanent hardness of water.)

- (a)  $\text{NaHCO}_3, \text{NaOCl}_2$     (b)  $\text{NH}_4\text{Cl}, \text{Na}_2\text{CO}_3$     (c)  $\text{Na}_2\text{CO}_3, \text{NH}_4\text{Cl}$     (d)  $\text{Na}_2\text{CO}_3, \text{NaHCO}_3$
- (iv) Which of the following compounds is alkaline in aqueous medium?  
 (a)  $\text{Na}_2\text{CO}_3$     (b)  $\text{NaCl}$     (c)  $\text{H}_2\text{CO}_3$     (d)  $\text{CuSO}_4$
- (v) Some statements regarding salt  $\text{NaCl}$  are given below:  
 (I) It is prepared by chlor-alkali process.  
 (II) It is a white crystalline substance.  
 (III) It also exists in the form of rocks and is called rock salt.  
 (IV) It is a neutral salt, pH value of  $\text{NaCl}$  is 7.  
 Select the correct statements.  
 (a) II and III only    (b) III and IV only    (c) I and IV only    (d) II, III and IV only

4

Read the following and answer any four questions from 4(i) to 4(v).

Chemically, Plaster of Paris (POP) is calcium sulphate hemihydrate, *i.e.*, containing half molecule of water of crystallisation. It is represented by the formula,  $\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$ . Half molecule of water of crystallisation means that one water molecule is shared by two formula units of  $\text{CaSO}_4$ . Hence, we also represent its formula as  $(\text{CaSO}_4)_2 \cdot \text{H}_2\text{O}$ . The name, plaster of Paris, was given to this compound because for the first time, it was made from gypsum which was mainly found in Paris.

- (i) The difference of water molecules in gypsum and plaster of Paris is  
 (a) 5/2    (b) 2    (c) 1/2    (d) 3/2
- (ii) Plaster of Paris hardens by  
 (a) giving off  $\text{CO}_2$     (b) changing into  $\text{CaCO}_3$   
 (c) combining with water    (d) giving out water.
- (iii) Which of the following statements is incorrect?  
 (a) Plaster of Paris is used to ornate designs on walls and ceilings.  
 (b) On heating gypsum above 373 K,  $\text{CaSO}_4$  is obtained.  
 (c) Dead burnt plaster is  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ .  
 (d) Setting of plaster is due to its hydration into gypsum.

For Online Tutorials, Subscribe  /careerplusacademy

- (iv) Select the incorrect statement with respect to gypsum.
- (a) It is slightly soluble in water.
  - (b) It is also known as alabaster.
  - (c) On heating gypsum at 373 K, it loses water molecules and becomes calcium sulphate hemihydrate.
  - (d) Chemical formula of gypsum is  $\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$ .
- (v) Plaster of Paris is obtained by
- (a) adding water to calcium sulphate
  - (b) adding sulphuric acid to calcium hydroxide
  - (c) heating gypsum to a very high temperature
  - (d) heating gypsum to  $100^\circ\text{C}$ .

5

Read the following and answer any four questions from 5(i) to 5(v).

pH is quite useful to us in a number of ways in daily life. Some of its applications are:

**Control of pH of the soil :** Plants need a specific pH range for proper growth. The soil may be acidic, basic or neutral depending upon the relative concentration of  $\text{H}^+$  and  $\text{OH}^-$ . The pH of any soil can be determined by using pH paper. If the soil is too acidic, it can be corrected by adding lime to it. If the soil is too basic, it can be corrected by adding organic manure which contains acidic materials.

**Regaining shine of a tarnished copper vessel by use of acids :** A copper vessel gets tarnished due to formation of an oxide layer on its surface. On rubbing lemon on the vessel, the surface is cleaned and the vessel begins to shine again. This is due to the fact that copper oxide is basic in nature, which reacts with the acid (citric acid) present in lemon to form a salt (copper citrate) which is washed away with water. As a result, the layer of copper oxide is removed from the surface of the vessel and the shining surface is exposed.

**Self-defence by animals through chemical warfare :** Stings of bees and ants contain methanoic acid. When stung, it causes lot of pain and irritation. This can be cured by rubbing the affected area with mild base like baking soda.

- (i) When black copper oxide placed in a beaker is treated with dilute HCl, its colour changes to
- (a) white
  - (b) dark red
  - (c) bluish green
  - (d) no change.
- (ii) *P* is an aqueous solution of acid and *Q* is an aqueous solution of base. When these two are diluted separately, then
- (a) pH of *P* increases while that of *Q* decreases till neutralisation.
  - (b) pH of *P* decreases while that of *Q* increases till neutralisation.
  - (c) pH of both *P* and *Q* decrease.
  - (d) pH of both *P* and *Q* increase.
- (iii) Which of the following acids is present in bee sting?
- (a) Formic acid
  - (b) Acetic acid
  - (c) Citric acid
  - (d) Hydrochloric acid
- (iv) Sting of ant can be cured by rubbing the affected area with soap because
- (a) it contains oxalic acid which neutralises the effect of formic acid
  - (b) it contains aluminium hydroxide which neutralises the effect of formic acid
  - (c) it contains sodium hydroxide which neutralises the effect of formic acid
  - (d) none of these.

