

SCIENCE • CLASS 10

CHAPTER 2

Acids, Bases and Salts

NCERT SOLUTIONS



ACIDS AND INDICATORS

Exercise 1 — A solution turns red litmus blue. Its pH is likely to be:

- (a) 1 (b) 4 (c) 5 (d) 10

Answer: (d) 10.

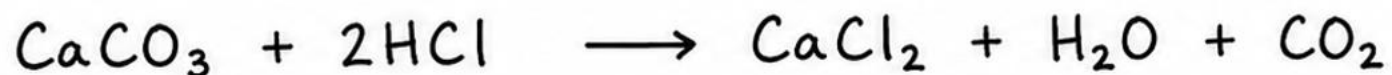
A base turns red litmus blue. A basic solution has a pH greater than seven.

Exercise 2 — A solution reacts with crushed eggshells and releases a gas that turns limewater milky. Which substance does it contain?

- (a) NaCl (b) HCl (c) LiCl (d) KCl

Answer: (b) HCl.

Eggshells contain calcium carbonate. Hydrochloric acid reacts with it to release carbon dioxide.



The insoluble calcium carbonate makes limewater milky.

NEUTRALISATION: AMOUNTS AND USES

Exercise 3 – A sodium hydroxide solution is completely neutralised by a hydrochloric acid solution. Find the acid volume needed for twice as much of the same alkali solution.

Given: 10 mL NaOH solution needs 8 mL HCl solution.

Required: HCl solution for 20 mL of the same NaOH solution.

Options: (a) 4 mL (b) 8 mL (c) 12 mL (d) 16 mL

Solution

Both solution concentrations stay the same. Doubling the alkali volume doubles the acid volume needed.

Required volume = $(20 \text{ mL} \div 10 \text{ mL}) \times 8 \text{ mL} = 16 \text{ mL}$

Answer: (d) 16 mL.

Exercise 4 – Which type of medicine is used for indigestion caused by excess stomach acid?

(a) Antibiotic (b) Analgesic (c) Antacid (d) Antiseptic

Answer: (c) Antacid.

Antacids neutralise excess stomach acid.

ZINC AND MAGNESIUM WITH ACIDS

Exercise 5(a, b) – Write word equations and balanced chemical equations for these reactions.

(a) Dilute sulphuric acid reacts with zinc granules.

Word equation: Zinc + sulphuric acid $\rightarrow$ zinc sulphate + hydrogen

Balanced equation: $\text{Zn(s)} + \text{H}_2\text{SO}_4\text{(aq)} \rightarrow \text{ZnSO}_4\text{(aq)} + \text{H}_2\text{(g)}$

(b) Dilute hydrochloric acid reacts with magnesium ribbon.

Word equation: Magnesium + hydrochloric acid $\rightarrow$ magnesium chloride + hydrogen

Balanced equation: $\text{Mg(s)} + 2\text{HCl(aq)} \rightarrow \text{MgCl}_2\text{(aq)} + \text{H}_2\text{(g)}$

In each reaction, the metal displaces hydrogen from the dilute acid.

ALUMINIUM AND IRON WITH ACIDS

Exercise 5(c, d)

Write word equations and balanced chemical equations for these reactions.

(c) Dilute sulphuric acid reacts with aluminium powder.

Word equation: Aluminium + sulphuric acid $\rightarrow$ aluminium sulphate + hydrogen

Balanced equation: $2\text{Al}(\text{s}) + 3\text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{Al}_2(\text{SO}_4)_3(\text{aq}) + 3\text{H}_2(\text{g})$

(d) Dilute hydrochloric acid reacts with iron filings.

Word equation: Iron + hydrochloric acid $\rightarrow$ iron(II) chloride + hydrogen

Balanced equation: $\text{Fe}(\text{s}) + 2\text{HCl}(\text{aq}) \rightarrow \text{FeCl}_2(\text{aq}) + \text{H}_2(\text{g})$

Dilute hydrochloric acid forms iron(II) chloride with iron.

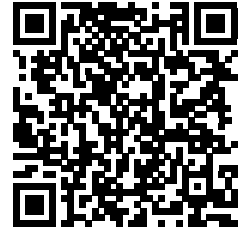


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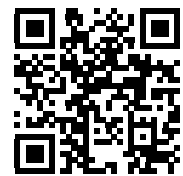


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