

# Q U E S T I O N

1. You have been provided with three test tubes. One of them contains distilled water and the other two contain an acidic solution and a basic solution, respectively. If you are given only red litmus paper, how will you identify the contents of each test tube?



## 2.1 UNDERSTANDING THE CHEMICAL PROPERTIES OF ACIDS AND BASES

### 2.1.1 Acids and Bases in the Laboratory

#### Activity 2.1

- Collect the following solutions from the science laboratory—hydrochloric acid (HCl), sulphuric acid ( $\text{H}_2\text{SO}_4$ ), nitric acid ( $\text{HNO}_3$ ), acetic acid ( $\text{CH}_3\text{COOH}$ ), sodium hydroxide (NaOH), calcium hydroxide [ $\text{Ca}(\text{OH})_2$ ], potassium hydroxide (KOH), magnesium hydroxide [ $\text{Mg}(\text{OH})_2$ ], and ammonium hydroxide ( $\text{NH}_4\text{OH}$ ).
- Put a drop of each of the above solutions on a watch-glass one by one and test with a drop of the indicators shown in Table 2.1.
- What change in colour did you observe with red litmus, blue litmus, phenolphthalein and methyl orange solutions for each of the solutions taken?
- Tabulate your observations in Table 2.1.

**Table 2.1**

Sample solution	Red litmus solution	Blue litmus solution	Phenolphthalein solution	Methyl orange solution

These indicators tell us whether a substance is acidic or basic by change in colour. There are some substances whose odour changes in acidic or basic media. These are called olfactory indicators. Let us try out some of these indicators.

#### Activity 2.2

- Take some finely chopped onions in a plastic bag along with some strips of clean cloth. Tie up the bag tightly and leave overnight in the fridge. The cloth strips can now be used to test for acids and bases.
- Take two of these cloth strips and check their odour.
- Keep them on a clean surface and put a few drops of dilute HCl solution on one strip and a few drops of dilute NaOH solution on the other.