

Class 7 Solutions Science Chapter 2 Exploring Substances: Acidic, Basic and Neutral

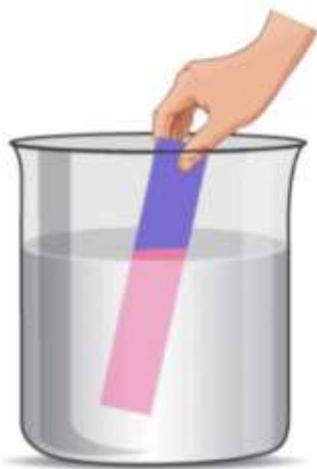
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Q1. A solution turns the red litmus paper to blue. Excess addition of which of the following solution would reverse the change?

- (i) Lime water
- (ii) Baking soda
- (iii) Vinegar
- (iv) Common salt solution

Answer: (iii) Vinegar.

Vinegar is acidic and would turn the blue litmus paper back to red, reversing the effect caused by the basic solution.



Q2. You are provided with three unknown solutions labelled A, B, and C, but you do not know which of these are acidic, basic, or neutral. Upon adding a few drops of red litmus solution to solution A, it turns blue. When a few drops of turmeric solution are added to solution B, it turns red. Finally, after adding a few drops of red rose extract to solution C, it turns green.

Based on the observations, which of the following is the correct sequence for the nature of solutions A, B, and C?

- (i) Acidic, acidic, and acidic
- (ii) Neutral, basic, and basic
- (iii) Basic, basic, and acidic
- (iv) Basic, basic, and basic

Answer:

(iii) Basic, basic, and basic.

- **Solution A:** Red litmus turns blue, indicating a basic solution, as bases turn red litmus blue. This is correct.

- **Solution B:** Turmeric solution turns red. Turmeric turns red in basic solutions and remains yellow in acidic or neutral solutions (as confirmed in Q10 of the document). Solution B must be basic.
- **Solution C:** Red rose extract turns green, indicating an basic solution. Thus, the correct sequence is:
 - Solution A: Basic
 - Solution B: Basic
 - Solution C: Basic

Q3. Observe and analyse Figs. 2.13, 2.14, and 2.15, in which red rose extract paper strips are used. Label the nature of solutions present in each of the containers.



Fig. 2.13

Fig. 2.14

Fig. 2.15

Answer: Red rose extract turns red in acidic solutions and green in basic solutions.

Fig. 2.13: The **red rose extract paper strip** turns **green** in the solution. This indicates that the solution is **basic**.

Fig. 2.14: The **red rose extract paper strip** shows no significant color change in the solution. This indicates that the solution is **neutral**.

Fig. 2.15: The **red rose extract paper strip** turns red. This indicates that the solution is **acidic**.

Q4. A liquid sample from the laboratory was tested using various indicators:

Indicator	Red litmus	Blue litmus	Turmeric
Change	No change	Turned red	No change in colour

Based on the tests, identify the acidic or basic nature of the liquid and justify your answer.

Answer: The liquid is **acidic** because it turned the **blue litmus paper red**, which is a clear indication of an **acidic** solution. Additionally, **no change in the turmeric paste** further suggests the presence of an acid.

- **Blue litmus paper turns red** in acidic solutions.
- **Turmeric paste remains unchanged** in acidic solutions, as turmeric changes to **red** in the presence of **basic** solutions, but **stays yellow in acidic solutions**.

Therefore, these observations confirm that the liquid is **acidic**.

Q5. Manya is blindfolded. She is given two unknown solutions to test and determine whether they are acidic or basic. Which indicator should Manya use to test the solutions and why?

Answer: **Smelling the solution** after adding an olfactory indicator allows Manya to determine whether the solution is acidic or basic based on the change in smell.



Olfactory indicators are useful when visual indicators (like litmus paper) cannot be used, such as when someone is blindfolded.

Vanilla extract:

- In an **acidic solution**, **vanilla extract** will have a **pleasant smell**.
- In a **basic solution**, its smell may become **fainter** or change slightly.

Onion (used in some cases):

- **Onion and garlic** have a strong smell that can sometimes change in the presence of bases, though they are not as commonly used as olfactory indicators.

	Acid	Base
Onion	Remains smell	Loses it's smell
Vanilla Extract	Remains smell	Loses it's smell

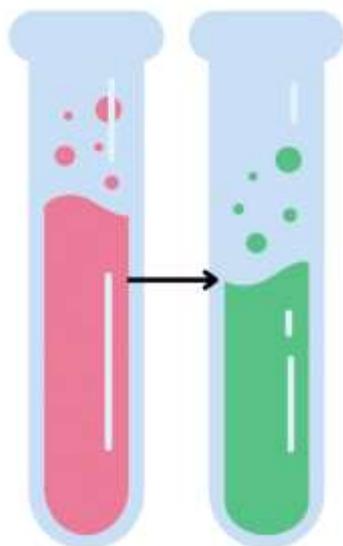
Q6. Could you suggest various materials which can be used for writing the message on the white sheet of paper (given at the beginning of the chapter) and what could be in the spray bottle? Make a table of various possible combinations and the colour of the writing obtained.

Answer:

Material for writing	Solution in the spray bottle	Colour of writing obtained
Vinegar	Baking soda solution	Visible message (red)
Turmeric paste	Soap solution	Visible message (yellow)
Red rose extract	Lemon juice	Visible message (green)

Q7. Grape juice was mixed with red rose extract; the mixture got a tint of red colour. What will happen if baking soda is added to this mixture? Justify your answer.

Answer: The color of the solution will change from red to green, as baking soda, a basic substance, neutralizes the acidic grape juice and red rose extract mixture, making it basic, and red rose extract turns green in basic solutions.



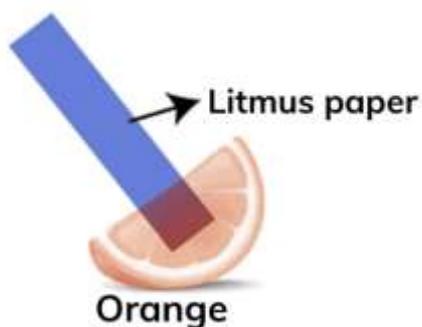
Changes color to green on adding baking soda

Q8. Keerthi wrote a secret message to her grandmother on her birthday using orange juice. Can you assist her grandmother in revealing the message? Which indicator would you use to make it visible?

Answer: Keerthi's grandmother can use **blue litmus paper** or **red rose extract** to detect whether the orange juice is acidic and make the message visible.

Blue Litmus Paper:

- Since **orange juice is acidic**, it will turn the **blue litmus paper red**.
- This indicates the presence of acid, and if the message was written using a substance that is **invisible in neutral or basic conditions**, it will become **visible** when the blue litmus paper turns red in the acidic environment.



Red Rose Extract:

- **Red rose extract is an acid base indicator that turns red in acidic solutions.**



- Since orange juice is acidic, it will cause the **red rose extract** to turn **red**, making the written message visible.



Q9. How can natural indicators be prepared? Explain by giving an example.

Answer: Natural indicators can be prepared by extracting colour pigments from natural substances like flowers, fruits, or vegetables.

For example, Preparation of Red Rose Extract

- Red rose extract is prepared by collecting fresh rose petals and washing them properly.
- The petals are then crushed and soaked in hot water.
- After some time, the mixture is filtered to get a red-colored liquid known as red rose extract.



Q10. Three liquids are given to you. One is vinegar, another is a baking soda solution, and the third is a sugar solution. Can you identify them only using turmeric paper? Explain.

Answer: Yes, you can identify the three liquids (vinegar, baking soda solution, and sugar solution) using **turmeric paper**, as turmeric acts as a natural pH indicator. Here's how:

Vinegar (Acidic):

- **Turmeric paper will remain yellow** when dipped in vinegar because **turmeric** stays yellow in **acidic solutions**.



- So, if the turmeric paper stays **yellow**, the liquid is **vinegar**.

Acid



Baking Soda Solution (Basic):

- **Turmeric paper** will turn **red** when dipped in a **basic** solution.
- Since **baking soda solution** is basic, the turmeric paper will turn **red**, indicating that the liquid is a **baking soda solution**.

Base



Sugar Solution (Neutral):

- **Turmeric paper** will stay **yellow** in a **neutral solution** (like sugar solution), as it does not react to neutral substances.
- If the turmeric paper remains **yellow**, the liquid is likely a **sugar solution**.

Neutral

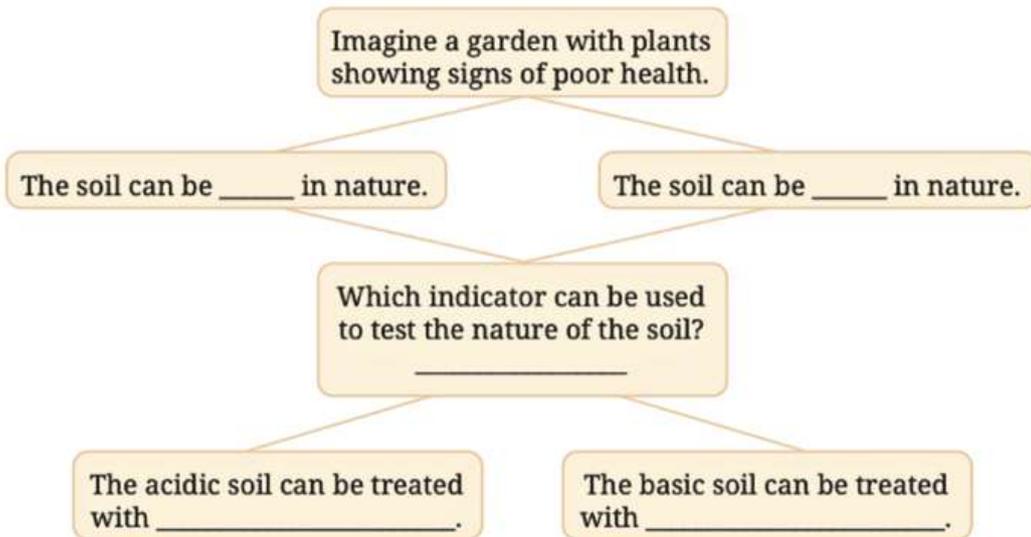


Q11. The extract of red rose turns the liquid X to green. What will the nature of liquid X be? What will happen when excess of amla juice is added to liquid X?

Answer: Liquid X is **basic** because the **red rose extract** turns **green** in basic solutions. Red rose extract is an indicator, and it turns **red in acidic solutions** and **green in basic solutions**. When **excess amla juice** (which is **acidic**) is added to **liquid X**, the solution will become **acidic**. The **red rose extract** will then **turn red** in the acidic solution, indicating that the solution has now become **acidic** due to the addition of the amla juice.



Q12. Observe and analyse the information given in the following flowchart. Complete the missing information.



Answer:

