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Acids, bases and neutralisation





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Acids, bases and neutralisation

Two strips, one mystery



THE IDEA

Use evidence from both strips. An unknown liquid turns blue litmus red. Red litmus stays red. These results support an acidic liquid.

Red litmus staying red alone is not enough: an acid and a neutral liquid can both do that.

CHECK YOUR THINKING

Blue litmus stays blue. What could the liquid be?

A Basic or neutral.

B Definitely neutral.

A. Basic or neutral.

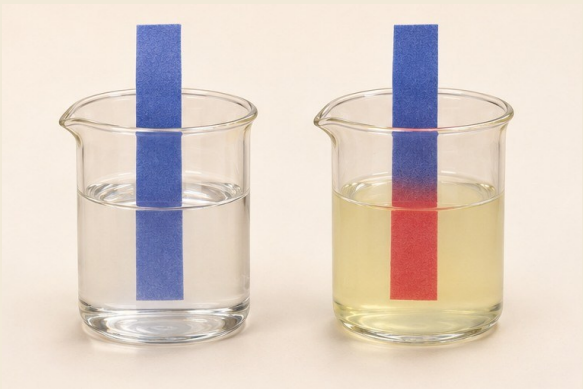
A RELATED EXAMPLE

Solve a second colour clue

A new liquid leaves red litmus red and blue litmus blue. Compare this with what an acid and a base would do. Explain why using two strips gives stronger evidence than using one. Never taste an unknown liquid.

Acids, bases and neutralisation

A lemon leaves a clue



THE IDEA

Blue litmus turns red in acidic lemon juice. Red litmus stays red in the same sample.

The change in the blue paper provides the useful evidence. Unknown liquids can be classified without tasting them.

CHECK YOUR THINKING

Which result supports an acid?

A Blue litmus becomes red.

B Red litmus becomes blue.

A. Blue litmus becomes red.

A RELATED EXAMPLE

When red turns blue

A soap solution changes red litmus to blue. This is evidence of a base. In neutral water neither colour changes. A basic sample and neutral water can both leave blue litmus blue.

Acids, bases and neutralisation

A flower can give a signal



THE IDEA

Red rose extract can show a red tint in acid and green in a base. Compare with the extract's starting colour under the same lighting.

A dark sample can hide a colour change, so a second indicator can help.

CHECK YOUR THINKING

A sample turns rose extract green. Which conclusion fits?

A It is basic under this test.

B It must be pure water.

A. It is basic under this test.

A RELATED EXAMPLE

Hidden writing

A colourless message can appear when an indicator touches it. Imagine a basic solution has dried on paper. Turmeric colours the basic strokes reddish-brown against yellow surroundings. Different indicators need different message liquids.

Acids, bases and neutralisation

The yellow stain



THE IDEA

Turmeric stays yellow in acid or neutral water but turns reddish-brown in a base. A brown patch on turmeric paper can turn yellow again when enough acid is added.

That reversal gives another useful comparison.

CHECK YOUR THINKING

Can unchanged yellow turmeric alone identify vinegar?

A Yes. Yellow always identifies an acid.

B No. Neutral water can give that appearance too.

B. No. Neutral water can give that appearance too.

A RELATED EXAMPLE

When opposite effects meet

Neutralisation is a reaction, not just two colours mixing. Acid and base react to form salt and water in this example. The mixture may warm because energy is released. Equal volumes need not contain matching reacting amounts. Extra acid leaves an acidic mixture; extra base leaves a basic one.

Acids, bases and neutralisation

When colour gives no clue



THE IDEA

Both onion-scented strips start with the same smell. After one touches a dilute acid, the smell is still noticeable. After the other touches a dilute base, it fades. An indicator that gives a smell clue is called an olfactory indicator.

Compare the reported results with an untreated strip.

CHECK YOUR THINKING

The onion smell is faint on every strip, even the untreated one. Can we identify the base? Why?

A. No. The starting scent is too weak for this comparison.

B. Yes. Any faint onion smell identifies a base.

A. No. The starting scent is too weak for this comparison.

LOOK AGAIN

What would the untreated strip tell us?

An untreated strip gives a baseline. Compare the reported changes with that baseline so that an already faint smell does not mislead you.

ONE LAST CHALLENGE

Why test the soil first?

A gardener wonders whether the soil needs a treatment that reduces acidity.



THE REVEAL

The treatment must fit the soil's present condition.

A treatment that helps acidic soil could make already alkaline soil less suitable.

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