SCIENCE FOUNDATIONS

Acids and bases

Difficulty level: Intermediate

Science Foundations

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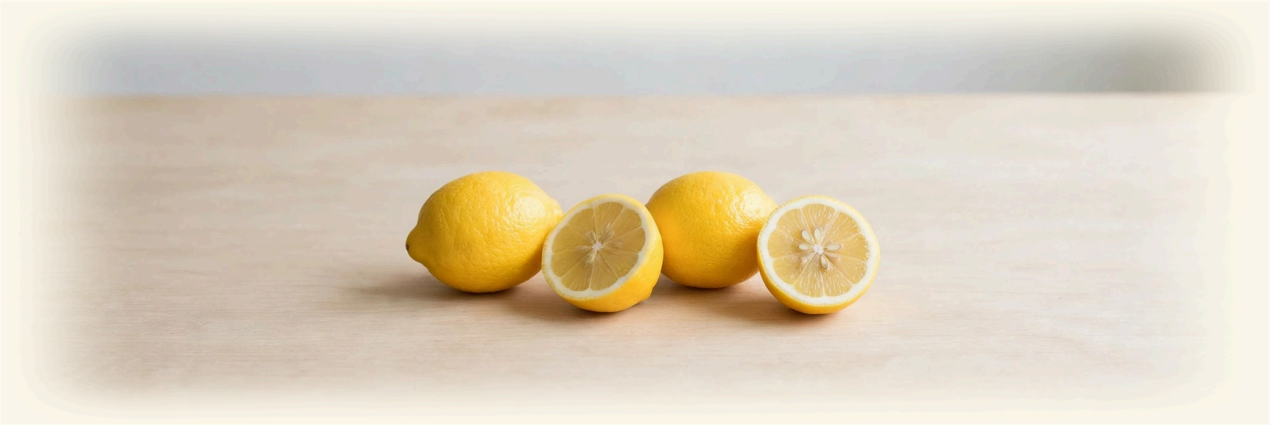
Overview of the concept

This is how you explain why lemon juice tastes sour, why soap feels slippery, and why an antacid settles an upset stomach. Lemon juice and vinegar are acids, which is why they taste sharp and can clean limescale off a kettle. Soap and baking soda are bases, which is why soap feels slippery between your fingers. An antacid works because it is a base that calms the acid in your stomach, and that is the same neutralizing idea at work in your kitchen and your medicine cabinet.



Rule

Acids and bases: a solution with pH below 7 is acidic, pH 7 is neutral, and pH above 7 is basic.

Acids release hydrogen ions (H+) in water, and bases release hydroxide ions (OH-) in water.

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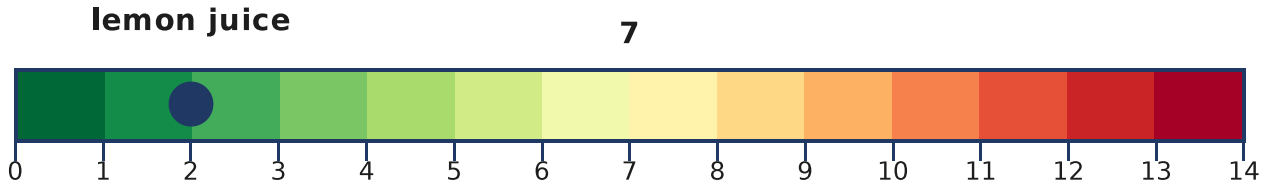
Worked examples

EXAMPLE 1

Q Classify lemon juice, pH 2.



SOLUTION

Check the pH against 7: 2 is below 7.

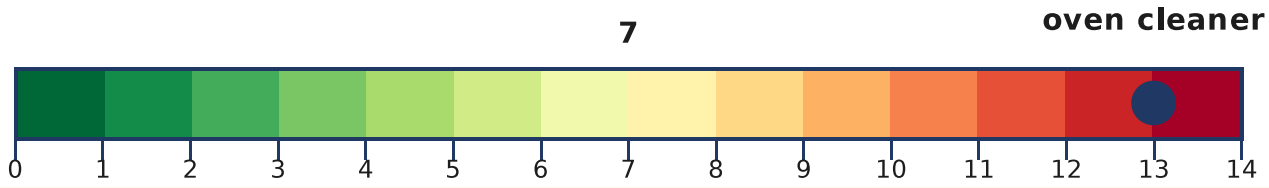
Below 7 means acidic.

Name its ion: it releases H+ in water.

The result is acid.

EXAMPLE 2

Q Classify oven cleaner, pH 13.



SOLUTION

Check the pH against 7: 13 is above 7.

Above 7 means basic.

Name its ion: it releases OH- in water.

The result is base.

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Practice questions

1 Grapefruit juice has pH 3. Is it an acid or a base?

- A Acid
- B Base
- C Neutral
- D Both

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2 Bleach has pH 12. Is it an acid or a base?

- A Acid
- B Base
- C Neutral
- D Both

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3

Pure water has pH 7. What is it: an acid, a base, or neutral?

A Acid

B Base

C Neutral

D Salt

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What ion do acids release?

A H+

B OH-

C Na+

D Cl-

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5 What ion do bases release?

A H+

B OH-

C Na+

D Cl-

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6 Is vinegar an acid?

A Yes

B No

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Is soap a base?

A Yes

B No

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pH below 7 means?

A Acidic

B Basic

C Neutral

D Salty

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9

pH above 7 means?

A Acidic

B Basic

C Neutral

D Salty

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10

Two liquids have pH 2 and pH 5. Which is more acidic?

A pH 2

B pH 5

C pH 7

D Both equally acidic

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ANSWER KEY

1. Acid

2. Base

3. Neutral

4. H+

5. OH-

6. Yes

7. Yes

8. Acidic

9. Basic

10. pH 2

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