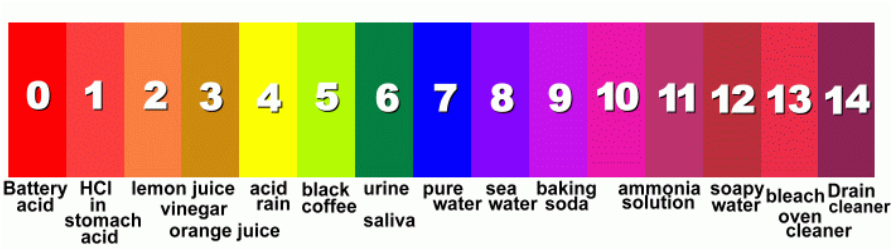
pH

Allows us to determine if a solution is acidic (H^+), neutral or basic (OH^-). → ALKALINE

0 - 6.9 7 7.1 - 14

ACID ← stronger neutral base → stronger



Calculating strength of pH

For every unit on the pH scale there is a 10x difference between strengths.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

10 x 10 x 10 10 x 10

How much weaker is an acid of 4 vs 1? 10 x 10 x 10 = 1000x

How much stronger is a base of 13 vs 8? 10 x 10 x 10 x 10 x 10 = 100 000 10^5

How much stronger is a base of 9 vs an acid of 5? 10 x 10 x 10 x 10 10^4 or 10 000

Determining strength to neutralize pH

How do antacids work.mp4

Each specific unit has its opposite on the pH scale.

To neutralize must have same amount and strength of the opposite unit.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

neutral

1- What would you add to neutralize 30 mL of a pH of 6? 30mL pH 8

2- What would you add to neutralize 60 mL of a pH of 10? 60 mL pH 4

3- You want to neutralize 50 mL of a pH of 3. You only have pH 8 available. What do you do? add more than 50 mL of pH 8.

Must remember: **The pH of rain water is 5.**

Identifying Unknowns

Buffer solutions

Clear liquids (chemicals) which have the strengths of specific pH levels. ex: buffer 8 = pH 8 buffer 4 = pH 4

Indicators

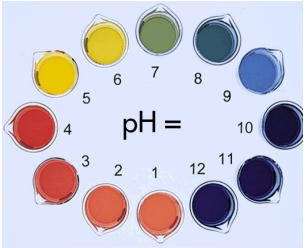
Liquids (chemicals) which will produce various colours when mixed with buffer solutions.

+ = various colours when mixed

buffer solutions indicators

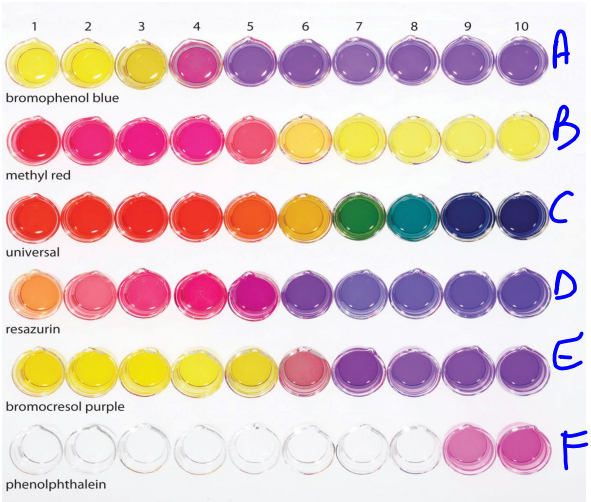
- Sometimes the colour change gives a lot of info, sometimes very little info.

Why different colours?



GREAT SCIENCE EXPERIMENT - Indicator Red Cabbage - PH Test - Indicator S

Lab



1- Best for strong acid?

2- Useless for base?

3- Best for a strong base?

4- Best for neutral?

5- Good for pH 5?

6- Best for pH 8?

7- Best overall info for acid, base and neutral?

Past Exam Questions

1. Using pH paper, a student determined that rainwater has a pH of 5 and that seawater has a pH of 8. What can the student conclude from these results?

A) Seawater is 3 times more acidic than rainwater.
B) Seawater is 3 times more alkaline than rainwater.
C) Seawater is 1000 times more acidic than rainwater.
D) Seawater is 1000 times more alkaline than rainwater.

2. Following a chemical spill, the contaminated soil reaches a pH value of 10. After a few days, a neutralization process begins and a second test is conducted. Its results show that the pH of the soil has become 10 times more acidic. What is the pH value after the second test?

A) pH= 1
B) pH= 7
C) pH= 9 9 10 11
D) pH= 11

3. Joanne carried out experiments to determine the pH value of different substances. The following table shows the results.

Substances	Lemon juice	Coffee	Seawater	Soap	Liquid bleach
pH value	2	5	8	9	12

Which of the following statements is true?

A) Liquid bleach is 6 times less acidic than lemon juice.
B) Lemon juice is 4 times more acidic than seawater.
C) Liquid bleach is 7 times less basic than coffee.
D) Soap is 10 times more basic than seawater.

Attachments

- GREAT_SCIENCE_EXPERIMENT_-_Indicator_Red_Cabbage_-_PH_Test_-_Indicator_Solution.avi
- How_do_antacids_work.mp4
- How do antacids work.mp4
- GREAT SCIENCE EXPERIMENT - Indicator Red Cabbage - PH Test - Indicator Solution.avi