

Introduction to Acids & Bases Reading

The degree of acidity or alkalinity (basic) is important in organisms. The body must constantly maintain a near neutral pH (7) in the blood and body tissues. To do this, the body produces buffers that can neutralize acids. Acidic and basic conditions in the body occur due to different metabolic (chemical) reactions taking place throughout the body.

1. What does alkalinity mean?

how basic something is

2. What pH must organisms maintain?

a neutral pH (7)

3. What chemicals does the body produce to keep neutral pH?

buffers help keep a neutral pH

4. What do buffers do to the acids in the body?

buffers neutralize acids

Water is one of the most important molecules in the body. Cells are made mostly of water and water is required for almost every metabolic reaction in the body. The force of attraction between water molecules is so strong that the oxygen atom of one molecule can actually remove the hydrogen from other water molecules. This reaction is known as dissociation, and it takes place in our cells. Water (H_2O) dissociates into H^+ and OH^- ions. A charged atom or molecule is called an ion. The OH^- ion is called the hydroxide ion, while the H^+ ion is called the hydrogen ion. Free H^+ ions can react with another water molecule to form the H_3O^+ or hydronium ion. The human body requires a neutral pH for many reasons. One reason cells like a neutral pH is for proteins. Basic or acidic solutions denature proteins (change their shape) so they no longer work.

5. What is dissociation?

When a compound breaks up into its ions

6. What is an ion?

a charged atom (-ion=anion & +ion=cation)

7. Name the 2 ions form when water dissociates.

H^+ = hydrogen ion & OH^- hydroxide ion

8. What is the hydroxide ion? The hydrogen ion? The hydronium ion?

OH^-

H^+

H_3O^+

9. Can you find these on the reference table? Where are they?

Yes - Table L = Bases
Table K = Acids

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Acidity or alkalinity is a measure of the relative amount of H^+ and OH^- ions dissolved in a solution. Neutral solutions have an equal number of H^+ and OH^- ions. Acids have more H_3O^+ ions (H^+) than OH^- ions. Acids taste sour and can be corrosive. Digestive fluids in the body are acidic and must be neutralized by buffers. Bases contain more OH^- ions than H_3O^+ ions. Bases taste bitter and feel slippery.

When an acid is combined with a base, neutralization occurs. The result of neutralization is a salt and water. Neutralization helps return our body pH to neutral. The process of our bodies maintaining neutral pH so that proteins can work properly without being denatured (unfolded) is known as homeostasis.

10. How do you measure for acidity or alkalinity?

11. What is a neutral solution?



12. **Fill in the blank:** Acids have more H_3O^+ ions and taste sour. And can be corrosive.

13. **Fill in the blank:** Bases contain more OH^- ions than H_3O^+ ions.

14. **Fill in the blank:** Digestive fluids are acid in the body and must be neutralized by buffers.

15. **Fill in the blank:** Bases taste bitter and feel slippery.

16. What is neutralization?

Acid + Base \rightarrow Salt + water when acid and base react to form a neutral solution

17. What 2 things are produced by neutralization?

salt and water

18. Neutralization keeps our pH at 7 (neutral) and is an example of maintaining homeostasis.