

What Are Acids and Bases?

Answer key

A. Definitions

1. Brønsted–Lowry acid and base.

An acid is a proton (H^+) **donor**; a base is a proton (H^+) **acceptor**.

2. Strong vs concentrated.

Strong means the acid ionizes completely in water. **Concentrated** means a large amount of acid is dissolved per volume. A dilute solution of a strong acid and a concentrated solution of a weak acid are both possible.

B. Acids, bases and conjugate pairs

3. Identify acid and base.

- (a) Acid: HNO_3 ; base: H_2O
(b) Acid: HCl ; base: NH_3
(c) Acid: HCO_3^- ; base: OH^-

4. Conjugate bases.

- (a) F^- (b) HSO_4^- (c) NH_3 (d) OH^-

5. Conjugate acids.

- (a) NH_4^+ (b) H_2O (c) H_3O^+ (d) HCO_3^-

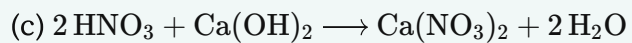
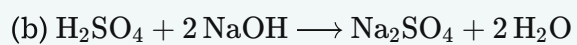
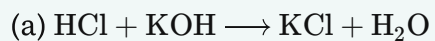
C. Strong and weak

6. Classify.

HCl and HNO_3 : strong acids. CH_3COOH : weak acid. NaOH : strong base. NH_3 : weak base.

D. Neutralization

7. Neutralization equations.



E. Challenge

8. Water acting both ways.

Such a substance is **amphoteric**. Water can accept a proton (becoming H_3O^+) when it meets a stronger acid, and donate a proton (becoming OH^-) when it meets a base such as ammonia.