

Acids and Bases Review

Define acids and bases –

Properties of acids and bases –

Terms used with acids and bases, and titrations –

Conjugate acids and bases –

pH and pOH problems –

[H₃O⁺] and [OH⁻] problems –

Dissociation reactions –

Neutralization reactions –

Titration problems –

Titration curves –

K_a and K_b problems –

1. Consider a 2.25×10^{-4} M solution of HNO₃.
 - a. Write a reaction showing the dissociation of the acid in water.
 - b. Label the conjugate acid and conjugate base.
 - c. Find the hydronium ion concentration.
 - d. Calculate the pH.
 - e. Calculate the pOH.

2. HCN has a $K_a = 4.0 \times 10^{-10}$. Calculate the pH of a 0.02 M solution of this acid.
$$\text{HCN} + \text{H}_2\text{O} \rightarrow \text{H}_3\text{O}^+ + \text{CN}^-$$

3. How many ml of 0.400 M KOH does it take to neutralize 40 ml of 0.200 M H₂SO₄?

4. If 35 ml of a NaOH solution requires 50 ml of 0.200 M HNO₃ to titrate it to the equivalence point, what is the concentration, in moles per liter, of the NaOH solution?