

Neutralization Worksheet

1. When solutions of hydrochloric acid (HCl) and potassium hydroxide (KOH) are mixed, the substances will react with each other.

What type of chemical reaction is involved? _____

Write a balanced equation for the reaction.

2. You are told an unknown solution turns red when mixed with an indicator. You are given the information below about the indicator.

pH	Indicator colour
Acid	Blue
Base	Red
Neutral	Green

You are told to neutralize the unknown solution. What should you do?

3. Which one of the following substances can be used to neutralize a solution whose pH is 8?

A) Na_2CO_3

B) NH_4Cl

C) HI

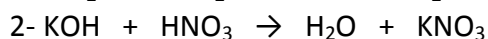
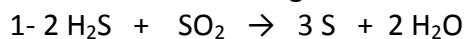
D) $\text{Mg}(\text{OH})_2$

4. Maude is taking care of the family swimming pool over the summer holidays. She carries out a test and sees that the pH of the water is 8.2. Since the pH value is too high, she must add one of the following products to the pool water: NaOH or HCl. Which product should she use?

A) NaOH, because the pool water is acidic C) NaOH, because the pool water is basic

B) HCl, because the pool water is acidic D) HCl because the pool water is basic

5. Consider the following 4 situations.



3- Lime, $\text{Ca}(\text{OH})_2$, is used to increase the pH of the water in a lake to approximately pH 7

4- Sodium hypochlorite, NaHClO , is used to disinfect the water in a swimming pool.

Which of the above situations correspond to an acid-base neutralization reaction?

A) Situations 1 and 3

C) Situations 2 and 3

B) Situations 1 and 4

D) Situations 2 and 4

6. Which of the following equations represents an acid-base neutralization reaction?

- A) $\text{CH}_4 + 2 \text{O}_2 \rightarrow \text{CO}_2 + 2 \text{H}_2\text{O}$
- B) $6 \text{CO}_2 + 6 \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6$
- C) $\text{Mg} + 2 \text{HCl} \rightarrow \text{H}_2 + \text{MgCl}_2$
- D) $\text{Ca}(\text{OH})_2 + 2 \text{HCl} \rightarrow \text{CaCl}_2 + 2 \text{H}_2\text{O}$

7. A basic solution of NaOH was neutralized with an acidic solution of H_3PO_4 . Which of the following is the balanced equation representing this neutralization reaction?

- A) $\text{NaOH} + \text{H}_3\text{PO}_4 \rightarrow \text{Na}_3\text{PO}_4 + \text{H}_2\text{O}$
- B) $3 \text{NaOH} + \text{H}_3\text{PO}_4 \rightarrow \text{Na}_3\text{PO}_4 + \text{H}_2\text{O}$
- C) $3 \text{NaOH} + \text{H}_3\text{PO}_4 \rightarrow \text{Na}_3\text{PO}_4 + 3 \text{H}_2\text{O}$
- D) $3 \text{NaOH} + 2 \text{H}_3\text{PO}_4 \rightarrow \text{Na}_3\text{PO}_4 + 3 \text{H}_2\text{O}$

8. Four substances involved in an acid-base neutralization reaction are listed below.

1- H_2O

2- KOH

3- KCl

4- HCl

Which of these substances are the products of this acid-base neutralization reaction?

- A) 1 and 3
- B) 1 and 4
- C) 2 and 3
- D) 2 and 4

9. In neutralizing sulfuric acid, H_2SO_4 , with caustic soda, NaOH, sodium sulfate, Na_2SO_4 , and water are produced.

Which equation represents this chemical reaction?

- A) $\text{H}_2\text{SO}_4 + 2 \text{NaOH} \rightarrow \text{Na}_2\text{SO}_4 + 2 \text{H}_2\text{O}$
- B) $\text{Na}_2\text{SO}_4 + 2 \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_4 + 2 \text{NaOH}$
- C) $\text{H}_2\text{SO}_4 + \text{NaOH} \rightarrow \text{Na}_2\text{SO}_4 + 2 \text{H}_2\text{O}$
- D) $\text{Na}_2\text{SO}_4 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_4 + 2 \text{NaOH}$