



Answer all the questions below as fully as you can then check your answers.

1. Fill in the gaps to complete the sentences below:
  - a. A base that is soluble in water is called an \_\_\_\_\_. Common bases include solid metal \_\_\_\_\_, metal \_\_\_\_\_ and metal \_\_\_\_\_.
2. Are most bases soluble or insoluble in water?
  - b. What is formed when a base does dissolve in water?
  - c. Name a few common alkalis.
  - d. What is the pH range of an alkali?
3. What do bases and alkalis have in common and how do they differ from each other?
4. Write the balanced chemical equation for the reaction between sodium oxide ( $\text{Na}_2\text{O}$ ) and water to form sodium hydroxide ( $\text{NaOH}$ ).
5. Explain why calcium hydroxide is considered an alkali.

6. Describe a laboratory test to identify an alkali.
- b. Match the following bases with their chemical formulas:

base
Calcium hydroxide
Potassium hydroxide
Magnesium hydroxide
Ammonium hydroxide

alkali
KOH
$\text{NH}_4\text{OH}$
$\text{Ca}(\text{OH})_2$
MgO

7. Write equations to show the formation of the three alkalis sodium hydroxide, potassium hydroxide and calcium hydroxide from their corresponding bases.
8. What is an alkali?
- a. Name two properties of alkalis.
- b. Give the chemical formula for magnesium hydroxide.
- c. What happens when an alkali reacts with an acid?

Answer: When an alkali reacts with an acid, they neutralise each other, forming a salt and water.

## Answers

1. Fill in the gaps to complete the sentences below:

a. A base that is soluble in water is called an \_\_\_\_\_. Common bases include solid metal \_\_\_\_\_, metal \_\_\_\_\_ and metal \_\_\_\_\_,

Answers: alkali, metal oxides, metal carbonates and metal hydroxides

2. Are most bases soluble or insoluble in water?

Answer: most bases are insoluble.

b. What is formed when a base does dissolve in water?

Answer: an alkali.

c. Name a few common alkalis.

Answer: solutions of sodium hydroxide (NaOH), potassium hydroxide (KOH), lithium hydroxide (LiOH), calcium hydroxide (Ca(OH)<sub>2</sub>) and ammonium hydroxide (NH<sub>4</sub>OH) are the common alkalis you are likely to use in the science lab

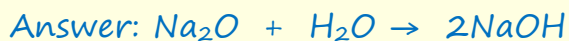
d. What is the pH range of an alkali?

Answer: Above 7

3. What do bases and alkalis have in common and how do they differ from each other?

Answer: Bases and alkalis will both neutralise acids, alkalis are aqueous solutions formed when bases dissolve in water.

4. Write the balanced chemical equation for the reaction between sodium oxide ( $\text{Na}_2\text{O}$ ) and water to form sodium hydroxide ( $\text{NaOH}$ ).



5. Explain why calcium hydroxide is considered an alkali.

Answer: Calcium hydroxide ( $\text{Ca}(\text{OH})_2$ ) is considered an alkali because it is a base that dissolves in water to form a solution with a pH greater than 7.

6. Describe a laboratory test to identify an alkali.

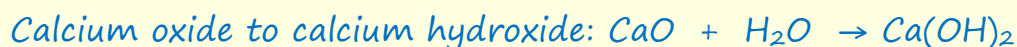
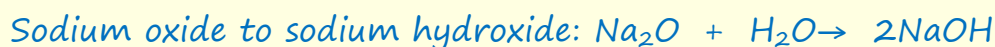
Answer: To identify an alkali, you can use red litmus paper or phenolphthalein/universal indicator or any other suitable indicator. An alkali will turn red litmus paper blue and phenolphthalein will turn pink/universal indicator will turn dark green/blue/purple in alkaline solutions depending on whether they are weak or strong alkalis.

- b. Match the following bases with their chemical formulas:

base	alkali
Calcium hydroxide	KOH
Potassium hydroxide	$\text{NH}_4\text{OH}$
Magnesium hydroxide	$\text{Ca}(\text{OH})_2$
Ammonium hydroxide	MgO

7. Write equations to show the formation of the three alkalis sodium hydroxide, potassium hydroxide and calcium hydroxide from their corresponding bases.

Answers:



8. What is an alkali?

*Answer: An alkali is a base that is soluble in water and produces an excess of hydroxide ions (OH<sup>-</sup>) in solution.*

a. Name two properties of alkalis.

*Answer: Alkalis have a slippery or soapy feel and can turn red litmus paper blue; they have pH values above 7.*

b. Give the chemical formula for magnesium hydroxide.

*Answer: Mg(OH)<sub>2</sub>*

c. What happens when an alkali reacts with an acid?

*Answer: When an alkali reacts with an acid, they neutralise each other, forming a salt and water.*