

QUIZ: CHEMICAL PROPERTIES OF ACIDS AND BASES

1. Given below are four sets of properties. Which of these sets represents the properties of an acid?

| | |
|-----|---|
| (a) | (i) The solution turns red litmus blue. (ii) The solution of the substance reacts with the zinc metal and produces hydrogen gas. |
| (b) | (i) The solution of the substance turns blue litmus red. (ii) The substance reacts with zinc and produces hydrogen gas. |
| (c) | (i) When a drop of solution of the substance is placed on litmus paper, no change in color takes place. (ii) There is no reaction when the solution of the substance reacts with zinc metal. |
| (d) | (i) The solution of the substance does not change the color of litmus paper. (ii) Zinc metal is coated with a brown layer when it is placed in the solution of the substance. |

2. A substance X reacts with sodium carbonate to produce sodium sulphate, a gas which turns lime water milky, and water. The substance 'X' is
- (a) Hydrochloric acid
 - (b) Nitric acid
 - (c) Sulphuric acid
 - (d) Sodium hydroxide

OXIDES

Answer questions 3 and 4 on the basis of the following four reactions of four different substances with an acid/base.



3. Which substance is an acidic oxide?

- (a) W
- (b) X
- (c) Y
- (d) Z

4. Which substance represents a basic oxide?

- (a) W
- (b) X
- (c) Y
- (d) Z

5. Solutions of substances A, B and C give following colors with different indicator solutions. Which of these substances will likely react with zinc metal to produce hydrogen?

| | Red litmus | Blue litmus | Phenolphthalein |
|------------|-------------------|--------------------|------------------------|
| Solution A | No change | No change | Colourless |
| Solution B | Blue | No change | Pink |
| Solution C | No change | Red | Colourless |

- (a) Only A
- (b) Only C
- (c) A and B
- (d) B and C

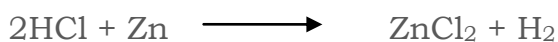
6. Which among the following is an amphoteric oxide?

- (a) Calcium oxide
- (b) Magnesium oxide
- (c) Aluminum oxide
- (d) Carbon dioxide

Answers:

1. (b)

Explanation: Acids turn blue litmus red. Acids react with zinc metal and produce hydrogen gas. For example, HCl



Although NaOH is a base, it also forms hydrogen gas with zinc metal, but it does not turn blue litmus red.

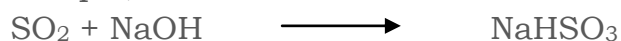
Note for the Teacher: A similar question may be framed for bases and salts

2. (c)

Explanation: Since the substance 'X' reacts with Na_2CO_3 , it should be an acidic substance. As sodium sulphate is formed in the reaction, it is formed from Na^+ ions of Na_2CO_3 and SO_4^{2-} ions from the acid. As the gas formed turns lime water milky, it is carbon dioxide.

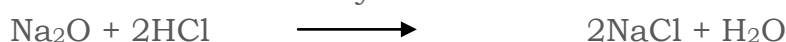
3. (c)

Explanation: An acidic oxide such as SO_2 , reacts with a base to yield salt. For example,



4. (d)

Explanation: The substance 'Z' is a basic oxide as basic oxides such as Na_2O react with an acid to yield salt and water.



Note for the Teacher: You may ask the question to (i) identify the metal and (ii) metal carbonate using the given four reactions.

5. (d)

Explanation: B is basic and C is acidic in nature. Acid and base both react separately with zinc metal and produce hydrogen gas.

6. (c)

Explanation: An amphoteric oxide reacts both with acids and bases to produce salt and water. Aluminium oxide reacts with acids and bases according to the following reactions;

