

O-level

### Reactivity series:

Some metals are more reactive than others. A list of metals with the most active at the top and the least active at the bottom is called the **Metal Reactivity Series.**

A metal high in the reactivity series replaces another metal lower in the series from its salt.

Replacement occurs most readily if there is a big gap between the two metals in the series.

For example, all elements higher than hydrogen in the reactivity series will displace hydrogen from water or they will react with water to producing hydrogen gas.

#### Reactivity series

POEM	NAME	SYMBOL
Popular	Potassium	K
Scientist	Sodium	Na
Can	Calcium	Ca
Make	Magnesium	Mg
A	Aluminium	Al
Zoo	Zinc	Zn
In	Iron	Fe
Low	Lead	Pb
Humid	Hydrogen	H
Country	Copper	Cu
Marvellous	Mercury	Hg
Silver	Silver	Ag
gold	Gold	Au

### EXERCISE:

Questions 1 to 11 circle the correct alternative

1. Metal P displaces metal R from its oxide and metal R displaces metal W from its oxide. Which of the following is the order of affinity of metals for oxygen?
  - A.  $W > R > P$
  - B.  $P > W > R$
  - C.  $R > P > W$
  - D.  $P > R > W$
2. Magnesium reduces oxide of metal Y, and Y displaces copper from its salt. Which one of the following is the order of reactivity of metals starting with the most reactive?
  - A.  $Cu > Y > Mg$
  - B.  $Mg > Cu > Y$
  - C.  $Mg > Y > Cu$
  - D.  $Y > Mg > Cu$
3. Hydrogen does not reduce oxide of Z but reduces oxide of Y more readily than it reduces the oxide of X. the reactivity of the elements X, Y and Z starting from the most reactive is?
  - A. X, Z, Y
  - B. Z, X, Y
  - C. Y, X, Z
  - D. Y, Z, X
4. Which of the following metals cannot displace lead from an aqueous solution of its salts
  - A. Magnesium
  - B. Zinc
  - C. Iron
  - D. Silver
5. The ease with which calcium, iron, magnesium and zinc react with hydrochloric acid to produce hydrogen is
  - A.  $Ca > Mg > Zn > Fe$
  - B.  $Mg > Ca > Fe > Zn$
  - C.  $Fe > Zn > Mg > Ca$
  - D.  $Ca > Zn > Fe > Mg$
6. Which of the following will displace lead from lead II nitrate?
  - A. Silver
  - B. Copper
  - C. Zinc
  - D. Mercury
7. The reaction of metals J, M and L with water under different conditions are described below  
J reacts with steam when the metal is strongly heated  
M reacts with water at room temperature  
L reacts with steam when the metal is red-hot  
The order of reactivity of metals, starting with the least reactive is
  - A. M, J and L
  - B. L, J and M
  - C. M, L and J
  - D. J, L and M
8. Which of the following metals displaces zinc from its salt solution



- A. Iron  
B. Copper  
C. Lead  
D. Calcium
9. Elements W, X, Y and Z and their oxides react as follows:  
Z displace X and W from their oxides  
W displaces X from its oxide and  
Y displaces Z from its oxide  
The order of reactivity of the metals is  
A.  $X > W > Z > Y$   
B.  $Y > Z > W > X$   
C.  $W > X > Y > Z$   
D.  $Y > Z > X > W$
10. Which of the following will occur when aluminium is added to a solution of silver nitrate?  
A. Heat is absorbed  
B. Aluminium hydroxide is formed  
C. Silver is precipitated out  
D. Aluminium form and alloy with silver
11. When copper powder is shaken with aqueous silver nitrate the colour of the solution changes to  
A. Brown  
B. Colourless  
C. Blue  
D. green

Question 12 consist of an assertion (statement) on the left-hand side and a reason on the right hand side.

Select

- A. If both assertion and reason are true statements and the reason is a correct explanation of the assertion.  
B. If both assertion and reason are true statements and the reason is **not** a correct explanation of the assertion  
C. If the assertion is true but the reason is not correct statement.  
D. If the assertion is not correct but the reason is a correct statement.

Instruction summarized

Assertion	
A. True	True and a correct explanation
B. True	True but not a correct explanation
C. True	Incorrect
D. Incorrect	Correct

12. When calcium is added to copper II sulphate solution, the colour of the Because Calcium reduces copper ions



solution changes from blue to colourless

For question 13 one or more of the answers given may be correct. Read each questions carefully and then indicate the correct answer according to the following

- A. If 1, 2, 3, only are correct
- B. If 1 and 3 only are correct
- C. If 2 and 4 only are correct
- D. If 4 only is correct

13. The order of reactivity of metals Z, Y and X is  $Y > Z > X$ . which of the following statements about the reaction of metals is/are true
- 1. Z displaces X from solution of its ions
  - 2. An oxide of Z reacts with both X and Y
  - 3. An oxide of Z reacts with Y but not with X
  - 4. X dissolves in an aqueous solution containing ions of Y



Answers

1. D    2. C    3. B    4. A    5. A    6. C    7. C    8. D    9. B    10. C    11. C  
12. A    13. B

