

s-Block Elements

Question1

Which one of the following nitrate will decompose to give NO_2 on heating ?

KCET 2024

Options:

A. NaNO_3

B. KNO_3

C. RbNO_3

D. LiNO_3

Answer: D

Solution:

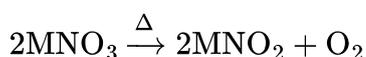
Among the given nitrates, only LiNO_3 will decompose to give NO_2 when heated. In contrast, the nitrates of sodium (Na), potassium (K), and rubidium (Rb) decompose to release oxygen instead.

The decomposition reactions are as follows:

For lithium nitrate (LiNO_3):



For sodium, potassium, and rubidium nitrates (MNO_3 , where $M = \text{Na}, \text{K}, \text{Rb}$):



Here, LiNO_3 uniquely produces NO_2 along with the metal oxide and oxygen.



Question2

The property of the alkaline earth metals that increases with their atomic number is

KCET 2021

Options:

- A. ionisation enthalpy
- B. electronegativity
- C. solubility of their hydroxide in water
- D. solubility of their sulphate in water

Answer: C

Solution:

The solubility of the ionic compounds (in this case is hydroxide of alkaline earth metals) depends on two factors, which are (i) lattice energy and (ii) hydration energy. Hence, solubility of alkaline earth metal increases with increase in their atomic number.

Whereas, other given properties i.e. ionisation energy, electronegativity and solubility of their sulphate in water decreases with atomic number.

Question3

The oxide of potassium that does not exist is

KCET 2020

Options:

- A. K_2O
- B. KO_2



C. K_2O_2

D. K_2O_3

Answer: D

Solution:

K_2O_2 may exist.

K_2O exists.

KO_2 also exists.

But, K_2O_3 can not exist as O_3^{2-} is not a stable entity.

Question4

The metal that produce H_2 with both dil. HCl and $NaOH(aq)$ is

KCET 2020

Options:

A. Zn

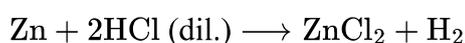
B. Mg

C. Ca

D. Fe

Answer: A

Solution:



But, Mg, Ca and Fe do not produce hydrogen, when react with aqueous NaOH.



C. $\text{CaSO}_4 \cdot \text{H}_2\text{O}$

D. $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

Answer: A

Solution:

Plaster of Paris is $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$. It is obtained by gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$), but when it heated above 393 K, it gives dead-burnt plaster (CaSO_4). Hence, CaSO_4 is also known as dead burnt plaster. \therefore (a) is the correct option.

Question7

Very pure N_2 can be obtained by

KCET 2018

Options:

A. thermal decomposition of ammonium dichromate

B. treating aqueous solution of NH_4Cl and NaNO_2

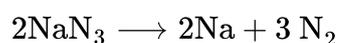
C. liquefaction and fractional distillation of liquid air

D. thermal decomposition of sodium azide

Answer: D

Solution:

By thermal decomposition of sodium azide very pure N_2 can be obtained.



Question8

Which of the following metallic oxide exhibit amphoteric nature?

KCET 2017



Options:

- A. CaO
- B. Al₂O₃
- C. Na₂O
- D. BaO

Answer: B**Solution:**

In the third period of the periodic table, as you move from left to right, the acidic character of oxides tends to increase. Consequently, sodium oxide (Na₂O) is strongly basic. Conversely, aluminum oxide (Al₂O₃) is amphoteric, meaning it can react both as an acid and as a base.

Moving down a group in the periodic table, such as Group II, the basic character of oxides increases, while the acidic character decreases. Therefore, calcium oxide (CaO) and barium oxide (BaO) are both basic in nature.

