

Redox reactions

Question 28

In which of the following species does arsenic have an oxidation number of +3?

- A. AsH_3 B. As_4O_6 C. H_3AsO_4 D. As_2O_5

Question 29

In which of the following sets are all the phosphorus atoms in the same oxidation state?

- A. PH_3 , P_2O_3 , H_3PO_3 , P_4O_6
B. H_2PO_4^- , $\text{P}_2\text{O}_7^{4-}$, P_4O_{10} , $\text{Na}_2\text{H}_2\text{P}_2\text{O}_7$
C. PH_3 , H_3PO_2 , H_3PO_3 , H_3PO_4
D. P_4O_6 , P_4O_8 , P_4O_9 , P_4O_{10}

Question 30

Which of the following reactions is a redox reaction?

- A. $2\text{NaH}_2\text{PO}_4(\text{aq}) \longrightarrow \text{Na}_2\text{H}_2\text{P}_2\text{O}_7(\text{aq}) + \text{H}_2\text{O}(\text{l})$
B. $\text{H}_2\text{SO}_4(\text{aq}) + \text{SO}_3(\text{g}) \longrightarrow \text{H}_2\text{S}_2\text{O}_7(\text{aq})$
C. $\text{NH}_4\text{NO}_3(\text{s}) \longrightarrow \text{N}_2\text{O}(\text{g}) + 2\text{H}_2\text{O}(\text{g})$
D. $\text{CaO}(\text{s}) + \text{H}_2\text{O}(\text{l}) \longrightarrow \text{Ca}(\text{OH})_2(\text{s})$

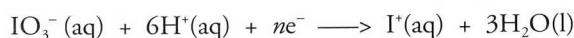
Question 31

For which of the following species is the oxidation number of oxygen the lowest?

- A. Na_2O_2 B. H_2O_2 C. O_2 D. H_2SO_4

Question 32

Iodate ion, IO_3^- , is as an oxidising agent. The half equation for the reaction is



The value of n in this equation is

- A. 3 B. 4 C. 5 D. 6

Question 33

When mixed with an acid, sodium thiosulfate, $\text{Na}_2\text{S}_2\text{O}_3$, decomposes according to the following equation



The different oxidation states of sulfur represented in this equation are

- A. +2, +4, 0 B. -2, -2, 0 C. +3, +6, 0 D. +2, +1, +1

Question 34

The underlined atoms in the species $\text{H}_2\text{S}_2\text{O}_7$ and $\underline{\text{N}}_2\text{O}_5$ have oxidation numbers of

- A. S = +6 and N = +5 B. S = +7 and N = +5
C. S = +6 and N = -5 D. S = +4 and N = -5

Question 35

100 mL of 1.00 M HCl is added to 10.0 g of calcium. After the reaction the mass, in grams, of calcium remaining is closest to

- A. 8.0 B. 6.0 C. 4.0 D. 2.0

Question 36

Magnesium metal is a powerful reductant. When a piece of magnesium is added to 4.0 M nitric acid, HNO_3 , a mixture of gases is produced. Which gas is least likely to be present in the mixture?

- A. H_2 B. NO C. NO_2 D. N_2O_5