Redox Reactions

Assertion Reason Questions

a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choice.

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).
(b) Both (A) and (R) are true but (R) is not the correct explanation of (A).
(c) (A) is true but (R) is false.
(d) (A) is false but (R) is true.

1. Assertion (A): Oxidation-Reduction (Redox) couple is the combination of oxidised and reduced form of a substance that is involved
in Oxidation-Reduction half cell.
Reason (R): As in representation $E°Fe^{3+}/Fe^{2+}$ and E cu^{2+}/cu+ are two Redox couples.

Ans. (c) (A) is true but (R) is false.
Explanation: Oxidation-Reduction (Redox) couple is the combination of oxidised and reduced form of a substance. Here, $E° Fe^{3+}/Fe^{2+}$ and $E°Cu^{2+}$ /cu+, represent reduction potential values.

2. Assertion (A): H_2SO_4 cannot act as a reducing agent.
Reason (R): Sulphur cannot increase its oxidation state beyond +6.

Ans. (a) Both (A) and (R) are true and (R) is the correct explanation of (A).
Explanation: Maximum oxidation state of S is +6, it cannot exceed it. Therefore, it cannot be further oxidised. Thus, H2SO4 cannot act as a reducing agent.

3. Assertion (A): In a redox reaction, the oxidation number of oxidant decreases while that of reductant increases.
Reason (R): Oxidant gains electron(s) and reductant lose electrons.

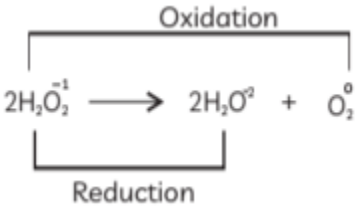
Ans. (a) Both (A) and (R) are true and (R) is the correct explanation of (A).
Explanation: During a redox reaction, the oxidant gains electrons and is reduced. Hence, its oxidation number decreases also, the reductant loses electrons and is oxidised, thus its oxidation number increases.

4. Assertion (A): The hydrogen of decomposition peroxide to form water and oxygen of is an example disproportionation

Reason (R): reaction. The oxygen of peroxide is in -1 oxidation state and it is converted to zero oxidation state in O_2 and $-_2$ oxidation state in H_2O.

Ans. (a) Both (A) and (R) are true and (R) is the correct explanation of (A).

Explanation:



Therefore, the above reaction is an example of disproportionation reaction.