

# Hydrocarbons

## 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):** Among isomeric pentanes, 2,2-dimethyl propane has the lowest boiling point.

**Reason (R):** Branching does not affect the boiling point.

**Ans.** (c) (A) is true but (R) is false.

**Explanation:** 2, 2-dimethylpropane has

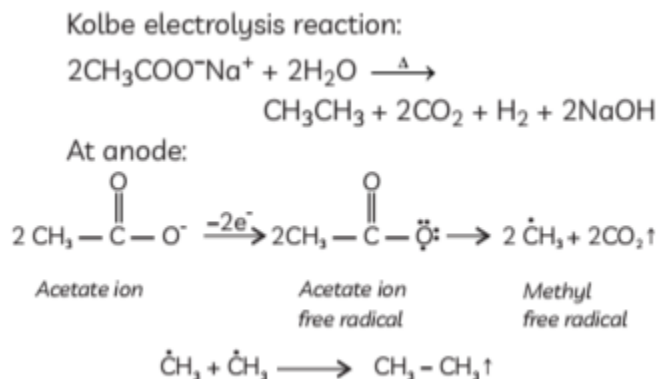
the lowest boiling point because branching affects the boiling point. As the branching increases, the boiling point decreases simultaneously. So, Assertion is true but Reason is false.

**2. Assertion (A):** Sodium acetate on Kolbe's electrolysis give methane.

**Reason (R):** Methyl free radical is formed at the anode.

**Ans.** (d) (A) is false but (R) is true.

**Explanation:** Sodium acetate on Kolbe electrolysis gives ethane. It is formed at the anode.



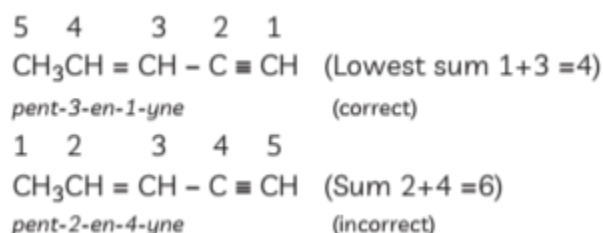
**3. Assertion (R):** The IUPAC name of  $\text{CH}_3\text{CH}=\text{CH}-\text{C}\equiv\text{CH}$  is pent-3-en-

1-yne and not pent-2-en-4-yne.

**Reason (R):** While deciding the locants of double and triple bonds, the lowest sum rule is always followed.

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

**Explanation:** Lowest sum rule is always followed, if both double and triple bonds are on same position then preference is given to the triple bond.



**4. Assertion (A):** Propene reacts with HBr in presence of benzoyl peroxide to yield 1-bromopropane.

**Reason (R):** In presence of peroxide, the addition of HBr to propene follows ionic mechanism.

**Ans.** (c) (A) is true but (R) is false.

**Explanation:** Propene reacts with HBr in presence of benzoyl peroxide to give 1-bromopropane. In presence of peroxide, the addition of HBr to propene occurs by a free radical mechanism.

**5. Assertion (A):** The compound cyclooctatetraene has the following structural formula:



It is cyclic and has a conjugated  $8\pi$ -electron system but it is not an aromatic compound.

**Reason (R):**  $(4n+2)$  electron rule does not hold good and ring is not planar.

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

**Explanation:** Aromaticity is demonstrated by compounds with the following properties: planarity, complete delocalization of the electrons in the ring, and the presence of  $(4n+2)\pi$  electrons in the ring, where  $n$  is an integer ( $n=0, 1, 2, \dots$ ). This is known as the Hückel rule. The given compound is antiaromatic, according to Hückel's rule.

**6. Assertion (A):** Pyrrole is an aromatic hetero- cyclic organic compound.

**Reason (R):** It has 6 electrons that are cyclic and delocalised.

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

**Explanation:** Pyrrole is a five-membered ring heterocyclic compound. It contains  $6\pi$