

Previous Year Questions

Subject	Chemistry
Class	11
Topic Name	Hydrocarbons

1. Which branched chain isomer of the hydrocarbon with molecular mass 72 u gives only one isomer of mono substituted alkyl halide?

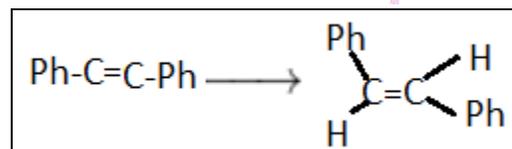
- (1) Neopentane
- (2) Isohexane
- (3) Neohexane
- (4) Tertiary butyl chloride

Solution:

Molecular mass indicates that it is pentane. Neopentane can only form one mono substituted alkyl halide as all the hydrogens are equivalent in neopentane.

Hence option (1) is the answer.

2. The reagent needed for converting



is

- (1) H₂ / lindlar Cat.
- (2) Catalytic Hydrogenation
- (3) LiAlH₄
- (4) Li/ NH₃

Solution:

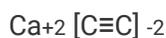
Li/NH₃ is the birch reagent. It reduces the alkyne to trans alkene.

Hence option (4) is the answer.

3. The number and type of bonds in C₂²⁻ ion in CaC₂ are:

- (1) Two σ bonds and one π – bond
- (2) Two σ bonds and two π – bonds
- (3) One σ bond and two π – bonds
- (4) One σ bond and one π bond

Solution:



One σ bond and two π – bonds are there in C₂²⁻ ion in CaC₂.

Hence option (3) is the answer.

4. Which one of the following is reduced with zinc and hydrochloric acid to give the corresponding hydrocarbon?

- (1) Ethyl acetate
- (2) Acetic acid
- (3) Acetamide
- (4) Butan-2-one

Solution:

Butan-2-one will get reduced into butane when treated with zinc and hydrochloric acid following Clemmensen reaction whereas Zn/HCl do not reduce ester, acid and amide.

Hence option (4) is the answer.

5. Which one of the following classes of compounds is obtained by polymerization of acetylene?

- (1) Poly-ene
- (2) Poly-yne
- (3) Poly-amide
- (4) Poly-ester

Solution:

Hence option (2) is the answer.

6. Which one of the following has the minimum boiling point?

- (1) n-Butane
- (2) 1-Butyne
- (3) 1-Butene
- (4) Isobutene

Solution:

Among the isomeric alkanes, the normal isomer has a higher boiling point than the branched-chain isomer. The higher the branching of the chain, the lower is the boiling point. The n-alkanes have more surface area in comparison to branched-chain isomers. So, intermolecular forces are weaker in branched-chain isomers. Hence they have lower boiling points in comparison to straight-chain isomers.

Hence option (4) is the answer.

7. One mole of a symmetrical alkene on ozonolysis gives two moles of an aldehyde having a molecular mass of 44 u.

The alkene is:-

- (1) Ethene
- (2) Propene
- (3) 1-Butene
- (4) 2-Butene

Solution:

2-Butene on ozonolysis gives 2 moles of acetaldehyde with the molecular mass of 44gm/mol.

Hence option (4) is the answer.

8. Ozonolysis of an organic compound gives formaldehyde as one of the products. This confirms the presence of:-

- (1) an isopropyl group
- (2) an acetylenic triple bond
- (3) two ethylenic double bonds
- (4) a vinyl group

Solution:

In Ozonolysis, the presence of the vinyl group gives formaldehyde as one of the products.

Hence option (3) is the answer.

9. In the presence of peroxide, HCl and HI do not give anti-Markovnikov's addition to alkenes because

- (1) All the steps are exothermic in HCl and HI
- (2) One of the steps is endothermic in HCl and HI
- (3) HCl is oxidizing and the HI is reducing
- (4) Both HCl and HI are strong acids

Solution:

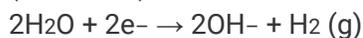
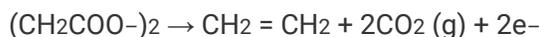
Bromides will take part in radical based reactions in the presence of organic peroxides. Fission of the peroxide O-O linkage causes a Br radical which behaves differently to Bromide, by adding to the less substituted side of the alkene (anti-Markovnikov). HI and HCl does not do this for energetic reasons. The addition of Cl and I radicals to the alkene in an anti-Markovnikov fashion is an endothermic reaction. Hence it is unfavourable. All hydrogen halides will add according to the Markovnikov rule, without the presence of peroxide,

Hence option (2) is the answer.

10. The gas liberated by the electrolysis of Dipotassium succinate solution is :

- (1) Ethyne
- (2) Ethene
- (3) Propene
- (4) Ethane

Solution:



So the gas generated during electrolysis of Dipotassium succinate solution is ethene.

Hence option (2) is the answer.

11. The hydrocarbon which can react with sodium in liquid ammonia is

- (1) $\text{CH}_3\text{CH}_2\text{C} \equiv \text{CCH}_2\text{CH}_3$
- (2) $\text{CH}_3\text{CH}_2\text{CH}_2\text{C} \equiv \text{CCH}_2\text{CH}_2\text{CH}_3$
- (3) $\text{CH}_3\text{CH}_2\text{C} \equiv \text{CH}$
- (4) $\text{CH}_3\text{CH} \equiv \text{CHCH}_3$

Solution:

Terminal alkynes have acidic hydrogen. Terminal alkynes react with sodium in liquid ammonia to give ionic compounds.

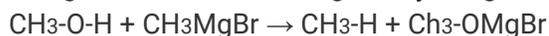
Hence option (3) is the answer.

12. The gas evolved on heating CH_3MgBr in methanol is

- (1) methane
- (2) ethane
- (3) propane
- (4) HBr

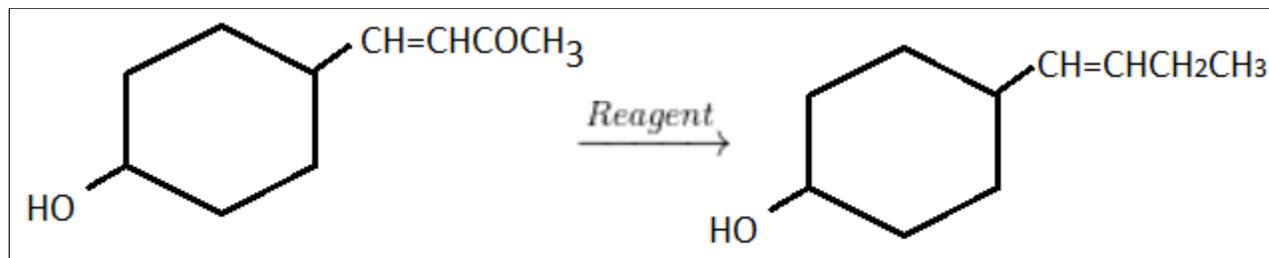
Solution:

The gas evolved on heating Methyl magnesium bromide in methanol is methane.



Hence option (1) is the answer.

13. In the given transformation, which of the following is the most appropriate reagent?



- (1) NaBH_4
- (2) $\text{NH}_2\text{-NH}_2, \text{OH}$
- (3) Zn - Hg / HCl
- (4) Na, Liq. NH_3

Solution:

In $\text{NH}_2\text{-NH}_2, \text{OH}$, the medium is basic so it will not have any effect on the OH group in the reagent.

Hence option (2) is the answer.

14. Polysubstitution is a major drawback in

- (a) Reimer-Tiemann reaction
- (b) Friedel-Crafts acylation
- (c) Friedel-Crafts alkylation
- (d) Acetylation of aniline.

Solution:

The product obtained is more activated in Friedel-Crafts alkylation and thus, polysubstitution will take place.

Hence option (3) is the answer.

15. In the hydroboration – oxidation reaction of propene with diborane, H_2O_2 and NaOH , the organic compound formed is :

- (1) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
- (2) $(\text{CH}_3)_3\text{COH}$
- (3) $\text{CH}_3\text{CHOHCH}_3$
- (4) $\text{CH}_3\text{CH}_2\text{OH}$

Solution:

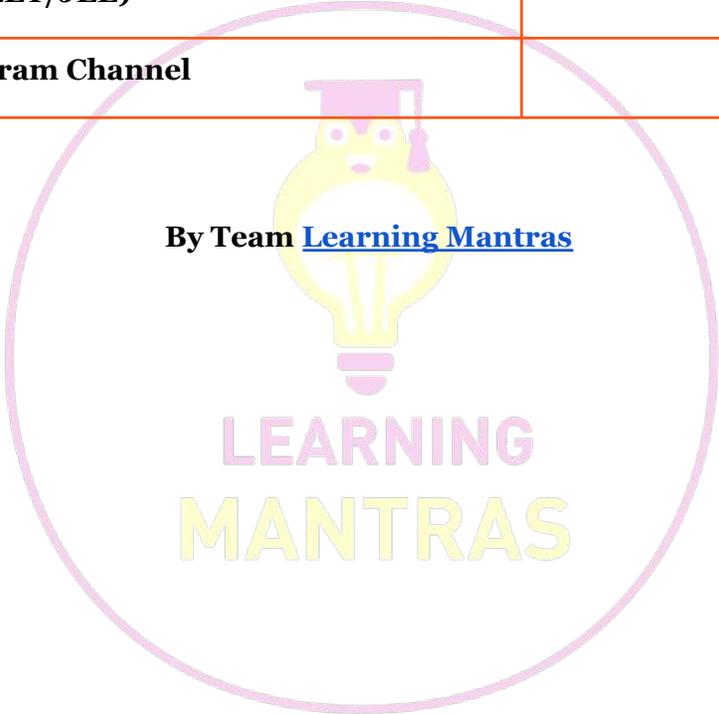
The hydroboration–oxidation reaction is a two-step hydration reaction that converts an alkene into alcohol. It is an anti-Markovnikov reaction. The organic compound formed in the hydroboration – oxidation reaction of propene with diborane, H_2O_2 and NaOH is $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$.

Hence option (1) is the answer.

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