Hydrocarbons

Set – 1

Table 13.2 Variation of Melting Point and Boiling Point in Alkanes

Molecular formula	Name	Molecular mass/u	b.p./(K)	m.p./(K)
CH_4	Methane	16	111.0	90.5
C_2H_6	Ethane	30	184.4	101.0
C_3H_8	Propane	44	230.9	85.3
C_4H_{10}	Butane	58	272.4	134.6
C_4H_{10}	2-Methylpropane	58	261.0	114.7
C_5H_{12}	Pentane	72	309.1	143.3
C_5H_{12}	2-Methylbutane	72	300.9	113.1
C_5H_{12}	2,2-Dimethylpropane	72	282.5	256.4
C_6H_{14}	Hexane	86	341.9	178.5
C_7H_{16}	Heptane	100	371.4	182.4
C_8H_{18}	Octane	114	398.7	216.2
C_9H_{20}	Nonane	128	423.8	222.0
$C_{10}H_{22}$	Decane	142	447.1	243.3
$C_{20}H_{42}$	Eicosane	282	615.0	236.2

Q1. Which is the alkane having the lowest melting point among themselves?

A. Methane
B. Ethane
C. Propane
D. Butane

Ans. (C)

Q2. Which of the following has the highest melting point?

A. Octane
B. Nonane
C. Decane
D. Eicosane

Ans. (C)

Q3. Which of the following has the highest boiling point?

A. 2-methylpropane
B. Pentane
C. 2-methylbutane
D. 2,2-dimethylpropane

Ans. (B)

Q4. Melting point shows uneven trend in alkanes with increase in molecular mass. Why?

A. Packing fraction
B. Symmetrical parameters
C. Hydrogen bonding
D. Both A and B

Ans. (D)

Set – 2

Table 13.2 Common and IUPAC Names of Alkynes (C_nH_{2n-2})

Value of n	Formula	Structure	Common name	IUPAC name
2	C_2H_2	H-C≡CH	Acetylene	Ethyne
3	C_3H_4	CH_3-C≡CH	Methylacetylene	Propyne
4	C_4H_6	CH_3CH_2-C≡CH	Ethylacetylene	But-1-yne
4	C_4H_6	CH_3-C≡C-CH_3	Dimethylacetylene	But-2-yne

Q1. What is the IUPAC name of Methylacetylene?

A. But-1-yne
B. Prop-2-ene
C. Propyne
D. But-2-yne

Ans. (C)

Q2. How many carbons are there in Dimethylacetylene?

A. three
B. four

C. five
D. six

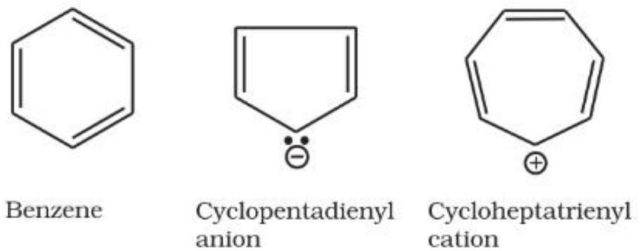
Ans. (B)

Q3. What is the IUPAC name of ethyl acetylene?

A. But-1-yne
B. Prop-2-ene
C. Propyne
D. Ethyne

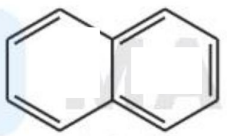
Ans. (A)

Set – 3

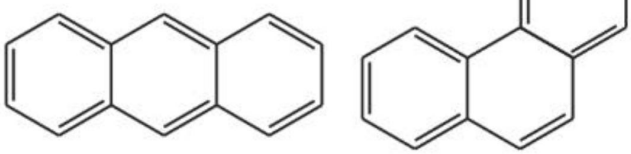


Benzene | Cyclopentadienyl anion | Cycloheptatrienyl cation

(n=1, 6π electrons)



Naphthalene
(n = 2, 10 π electrons)



Anthracene | Phenanthrene

(n =3, 14 π electrons)

Q1. How many pi-electrons are in Naphthalene?

A6
B. 8
C. 14
D. 10

Ans. (D)

Q2. How many pi-electrons are in Anthracene?

A. 6
B. 8
C. 14
D. 10

Ans. (C)

Q3. How many benzene rings in Anthracene?

A. 3
B. 2
C. 1
D. 4

Ans. (2)

Q4. How many benzene rings in Naphthalene?

A. 3
B. 4
C. 1
D. 2

Ans. (D)

Q5. How many sp2 hybridized C atoms in Naphthalene?

A. 6
B. 10
C. 8
D. 12

Ans. (B)

Q6. How many pi-electrons in cyclopentadienyl?

A. 6
B. 10
C. 8
D. 14

Ans. (A)

Q7. How many pi-electrons in cycloheptatrienyl?

A. 14
B. 8
C. 10
D. 6

Ans. (D)