

Nama:

Kelas/No. Absen:

STRUKTUR DAN TATA NAMA ALKANA

Indikator Pencapaian Kompetensi

1. Mengkategorikan senyawa hidrokarbon berdasarkan ikatan rantai karbon (alkana, alkena dan alkuna)
2. Menentukan tata nama senyawa hidrokarbon



Perhatikan dan pahami penjelasan video berikut ini!

A. PENDAHULUAN

Berdasarkan jumlah ikatan antara atom karbon, senyawa karbon dikelompokkan menjadi senyawa jenuh dan tidak jenuh. Pada senyawa hidrokarbon jenuh, atom karbon dapat mengikat atom hidrogen secara maksimal. Senyawa yang tergolong hidrokarbon jenuh adalah golongan alkana. Senyawa hidrokarbon tak jenuh mengandung ikatan rangkap dua antar atom karbonnya yang disebut alkena dan ikatan rangkap tiga yang disebut alkene.

B. EKSPLORASI DAN PEMBENTUKAN KONSEP

1. Pengertian Alkana

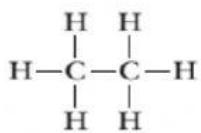
Senyawa alkana merupakan senyawa hidrokarbon dengan rantai karbon yang paling sederhana. Alkana merupakan senyawa hidrokarbon yang seluruh ikatan pada atom karbonnya

2. Rumus molekul Alkana

Rumus umum Alkana yaitu:

Jika atom C = 2, maka atom H = $2(2) + 2 = 6$

Bila dituliskan rumusnya menjadi C_2H_6 . Jika dijabarkan akan menjadi:



Berikut merupakan daftar nama 10 deret pertama dari senyawa alkana:

| No | Rumus molekul | Rumus struktur | Nama senyawa |
|----|---------------------------------|---|--------------|
| 1 | CH ₄ | CH ₄ | |
| 2 | C ₂ H ₆ | CH ₃ —CH ₃ | |
| 3 | C ₃ H ₈ | CH ₃ —CH ₂ —CH ₃ | |
| 4 | C ₄ H ₁₀ | CH ₃ —CH ₂ —CH ₂ —CH ₃ | |
| 5 | C ₅ H ₁₂ | CH ₃ —CH ₂ —CH ₂ —CH ₂ —CH ₃ | |
| 6 | C ₆ H ₁₄ | CH ₃ —CH ₂ —CH ₂ —CH ₂ —CH ₂ —CH ₃ | |
| 7 | C ₇ H ₁₆ | CH ₃ —CH ₂ —CH ₂ —CH ₂ —CH ₂ —CH ₂ —CH ₃ | |
| 8 | C ₈ H ₁₈ | CH ₃ —CH ₂ —CH ₂ —CH ₂ —CH ₂ —CH ₂ —CH ₂ —CH ₃ | |
| 9 | C ₉ H ₂₀ | CH ₃ —CH ₂ —CH ₃ | |
| 10 | C ₁₀ H ₂₂ | CH ₃ —CH ₂ —CH ₂ —CH ₂ —CH ₃ CH ₂ —CH ₂ —CH ₂ —CH ₂ —CH ₃ | |

3. Tata Nama Senyawa Alkana

Aturan Tata nama senyawa Alkana menurut IUPAC (*International Union of Pure and Applied Chemistry*) sebagai berikut:

1

2

3

4

5

Jika cabangnya sama,

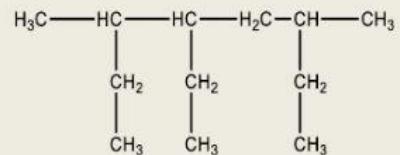
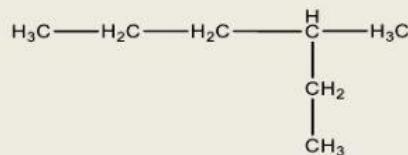
3. MODEL CABANG/ALKIL

| No | Model Cabang/Alkil | Nama alkil |
|----|---|------------|
| 1 | $\begin{array}{ccccccc} \text{H}_3\text{C} & - & \text{CH} & - & \text{CH}_2 & - & \text{CH}_3 \\ & & & & & & \\ & \text{CH}_3 & & & & & \end{array}$ | |
| 2 | $\begin{array}{ccccccc} \text{H}_3\text{C} & - & \text{H}_2\text{C} & - & \text{CH} & - & \text{CH}_2 & - & \text{CH}_2 & - & \text{CH}_3 \\ & & & & & & & & & & & \\ & & & & \text{CH}_2 & & & & & & & \\ & & & & & & & & & & & \\ & & & & \text{CH}_3 & & & & & & & \end{array}$ | |
| 3 | $\begin{array}{ccccccc} \text{H}_3\text{C} & - & \text{H}_2\text{C} & - & \text{H}_2\text{C} & - & \text{CH} & - & \text{CH}_2 & - & \text{CH}_2 & - & \text{CH}_2 & - & \text{CH}_3 \\ & & & & & & & & & & & & & & & \\ & & & & & & \text{CH}_2 & & & & & & & & & \\ & & & & & & & & & & & & & & & \\ & & & & & & \text{CH}_2 & & & & & & & & & \\ & & & & & & & & & & & & & & & \\ & & & & & & \text{CH}_3 & & & & & & & & & \end{array}$ | |
| 4 | $\begin{array}{ccccccc} & & & & \text{CH}_3 & & \\ & & & & & & \\ & & & & \text{H}_3\text{C} & - & \text{C} \\ & & & & & & \\ & & & & \text{CH}_3 & - & \text{H}_2\text{C} \\ & & & & & & \\ & & & & \text{CH}_2 & - & \text{CH} \\ & & & & & & \\ & & & & \text{CH} & - & \text{CH}_3 \\ & & & & & & \\ & & & & \text{CH}_3 & & \end{array}$ | |
| 5 | $\begin{array}{ccccccc} \text{H}_3\text{C} & - & \text{H}_2\text{C} & - & \text{H}_2\text{C} & - & \text{H} \\ & & & & & & \\ & & & & & & \text{C} \\ & & & & & & \\ & & & & & & \text{CH}_2 \\ & & & & & & \\ & & & & & & \text{CH}_2 \\ & & & & & & \\ & & & & & & \text{CH}_2 \\ & & & & & & \\ & & & & & & \text{CH}_3 \end{array}$ | |
| 6 | $\begin{array}{ccccccc} \text{H}_3\text{C} & - & \text{H}_2\text{C} & - & \text{H}_2\text{C} & - & \text{H}_2\text{C} \\ & & & & & & \\ & & & & & & \text{C} \\ & & & & & & \\ & & & & & & \text{H} \\ & & & & & & \\ & & & & & & \text{C} \\ & & & & & & \\ & & & & & & \text{CH}_2 \\ & & & & & & \\ & & & & & & \text{CH}_2 \\ & & & & & & \\ & & & & & & \text{CH}_3 \end{array}$ | |

| | | |
|---|---|--|
| 7 | $\begin{array}{ccccccccc} \text{H}_3\text{C} & -\text{H}_2\text{C} & -\text{H}_2\text{C} & -\text{H}_2\text{C} & -\text{C}^{\text{H}} & -\text{H}_2\text{C} & -\text{CH}_2 & -\text{CH}_2 & -\text{CH}_3 \\ & & & & & & & & \\ & & & & \text{HC} & -\text{CH}_3 & & & \\ & & & & & & & & \\ & & & & \text{CH}_2 & & & & \\ & & & & & & & & \\ & & & & \text{CH}_3 & & & & \end{array}$ <p style="text-align: center;"> </p> | |
| 8 | $\begin{array}{ccccccccc} \text{H}_3\text{C} & -\text{H}_2\text{C} & -\text{H}_2\text{C} & -\text{H}_2\text{C} & -\text{C}^{\text{H}} & -\text{H}_2\text{C} & -\text{CH}_2 & -\text{CH}_3 \\ & & & & & & & \\ & & & & \text{H}_3\text{C} & -\text{C} & -\text{CH}_3 & \\ & & & & & & & \\ & & & & \text{CH}_3 & & & \end{array}$ <p style="text-align: center;"> </p> | |



CONTOH SOAL

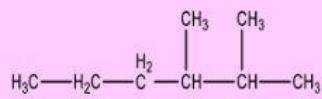


LATIHAN SOAL

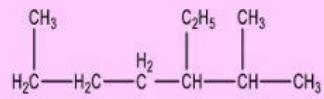
A. Tentukan struktur alkana yang tepat dari nama berikut ini!

1) 2,3-dimetilheptana

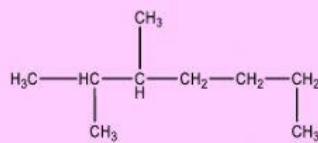
a.



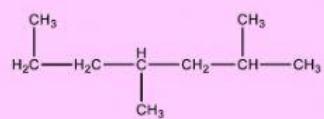
C.



b.

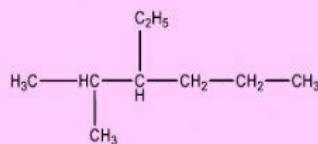


d.

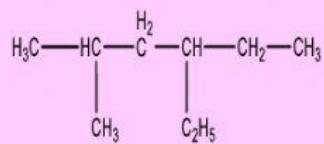


2) 4-etil-2-metilheksana

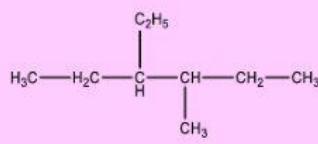
a.



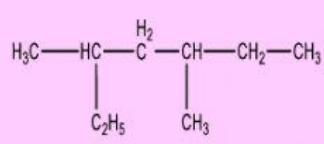
c.



b.

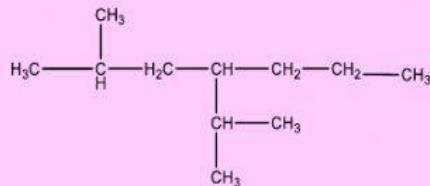


d.

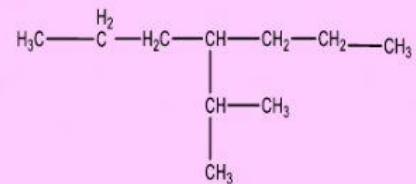


3) 4-isopropil-2-metilheptana

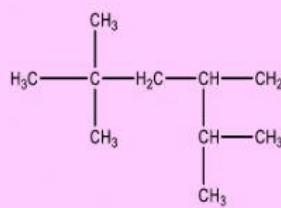
a.



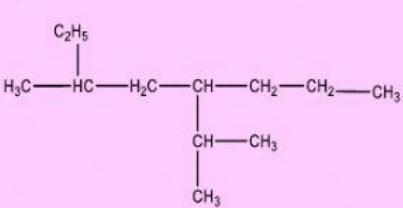
c.



b.

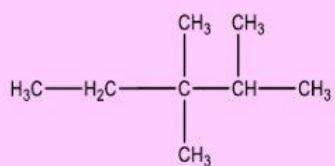


d.

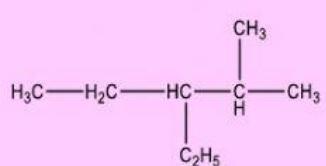


4) 3-ethyl-2-metylpentana

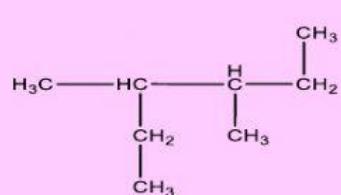
a.



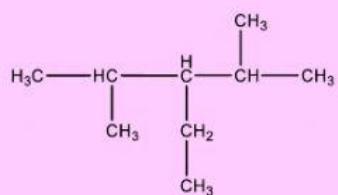
c.



b.



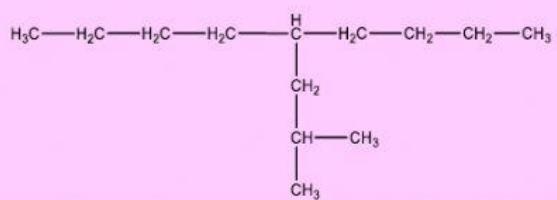
d.



B. Berilah nama senyawa hidrokarbon berikut!

| No | Rumus struktur | Nama |
|----|---|------|
| 1 | $\begin{array}{ccccc} & \text{CH}_3 & & & \\ & & & & \\ \text{H}_3\text{C} & -\text{C} & -\text{CH}_2 & -\text{CH}_2 & -\text{CH}_2 \\ & & & & \\ & \text{H} & & & \\ & & & & \text{CH}_3 \end{array}$ | |
| 2 | $\begin{array}{ccccccc} & \text{CH}_3 & & & & & \\ & & & & & & \\ & \text{CH}_2 & & & & & \\ \text{H}_3\text{C} & -\text{H}_2\text{C} & -\text{C} & -\text{CH}_2 & -\text{CH} & -\text{CH}_3 & \\ & & & & & & \\ & \text{H} & & & \text{CH}_3 & & \\ & & & & & & \\ & & & & \text{CH}_3 & & \end{array}$ | |
| 3 | $\begin{array}{ccccccc} & \text{CH}_3 & & & & & \\ & & & & & & \\ & \text{CH}_3 & & & & & \\ \text{H}_3\text{C} & -\text{C} & -\text{H}_2\text{C} & -\text{CH} & -\text{CH}_2 & -\text{CH}_2 & -\text{CH}_3 \\ & & & & & & \\ & \text{CH}_3 & & \text{CH} & -\text{CH}_3 & & \\ & & & & & & \\ & & & \text{CH}_3 & & & \end{array}$ | |

4



Kesimpulan

Tuliskan pengertian alkana dan urutan tata nama senyawa alkana!