

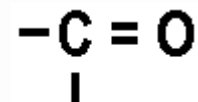
KULIAH KIMIA ORGANIK

SENYAWA ALDEHIDA DAN KETON

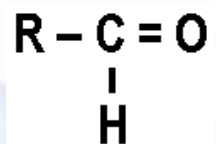
Program Sarjana Farmasi (S1-Farmasi)
Fakultas Farmasi Universitas Pancasila
Genap 2025/2026

SENYAWA ALDEHIDA DAN KETON

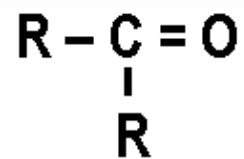
- Senyawa dengan gugus karbonil



- Aldehid



- Keton



Dimana R = gugus alkil

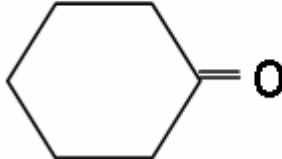
- Tata Nama Aldehid :

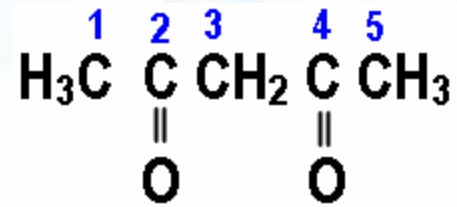
- IUPAC : Huruf akhir – a pada alkana, diganti – al
- TRIVIAL : Berakhiran - aldehid

		IUPAC	TRIVIAL
1C	$\begin{array}{c} \text{H C} = \text{O} \\ \\ \text{H} \end{array}$	Metanal	formaldehid
2C	$\begin{array}{c} \text{H}_3\text{C} - \text{C} = \text{O} \\ \\ \text{H} \end{array}$	Etanal	asetaldehid
3C		Propanal	propionaldehid
4C		Butanal	butiraldehid
5C		Pentanal	valeraldehid
6C		Heksanal	kaproaldehid
7C		Heptanal	enantaldehid
8C		Oktanal	kaprialdehid
9C		Nonanal	pelargonaldehid
10C		Dekanal	kapraldehid

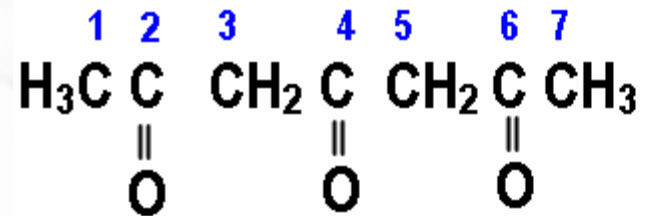
Tata Nama Keton

- IUPAC : Huruf akhir – a pada alkana, diganti -on
- TRIVIAL : Alkilketon

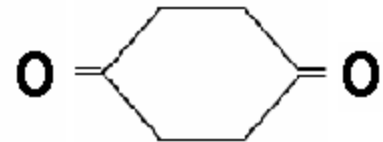
	IUPAC	TRIVIAL
$\begin{array}{c} \text{H}_3\text{C} - \text{C} - \text{CH}_3 \\ \parallel \\ \text{O} \end{array}$	propanon	dimetil keton (aseton)
$\begin{array}{c} \text{H}_3\text{CC} \text{ CH}_2 \text{ CH}_3 \\ \parallel \\ \text{O} \end{array}$	butanon	metiletil keton
	sikloheksanon	sikloheksil keton



2, 4 – pentanadion

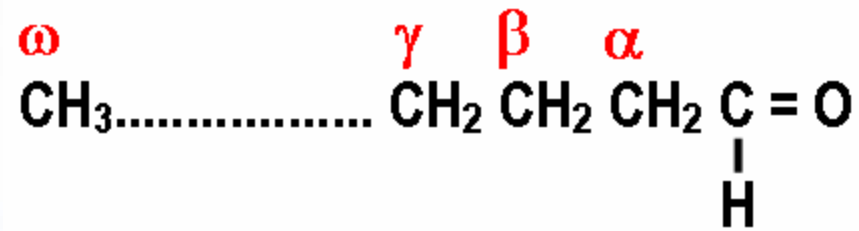


2,4,6 – heptanatrion

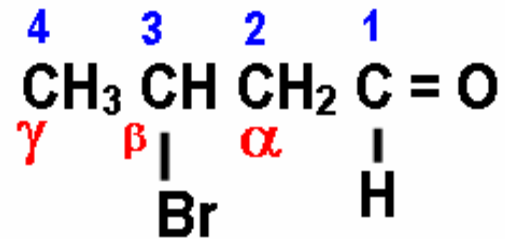


1, 4 – sikloheksanadion

- Atom C yang terdekat dengan atom C karbonil disebut C- α
- Atom C berikutnya β, γ, δ dst.
- C ujung suatu rantai panjang disebut atom C- ω



Contoh :



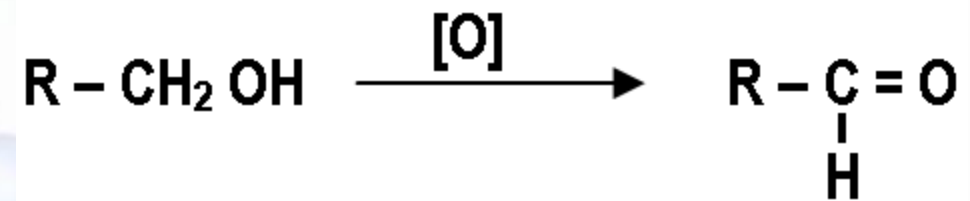
- **IUPAC** : 3 – bromobutanal
- **TRIVIAL** : β - bromobutiraldehid

SIFAT FISIKA ALDEHID / KETON :

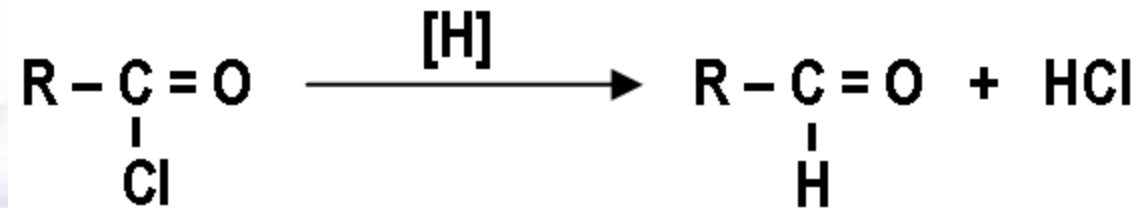
- Polar
- TD > TD Alkana
- BM < : larut dalam air
- BM > : larut dalam pelarut organik

- **Pembuatan Aldehid**

1. Oksidasi alkohol primer

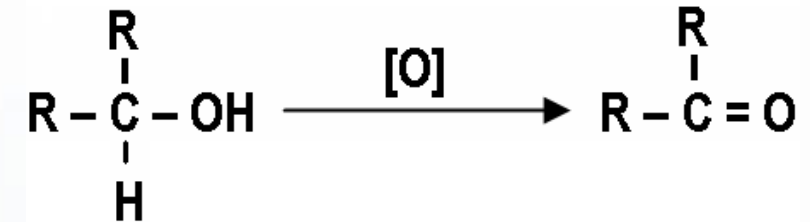


2. Reduksi asil klorida

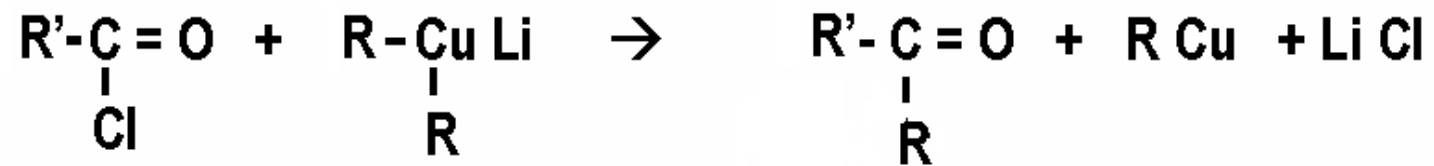


- **Pembuatan Keton**

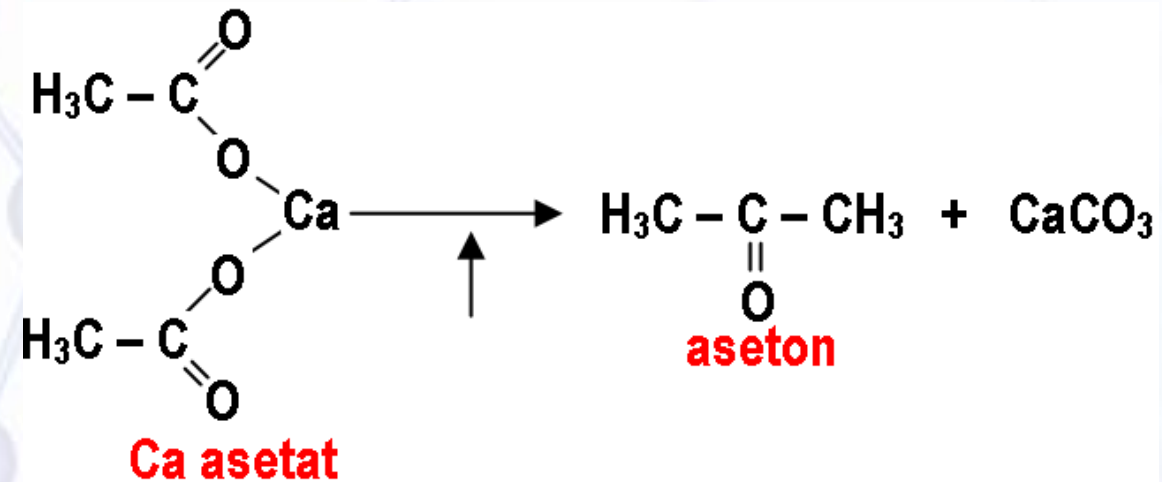
1. Oksidasi alkohol sekunder



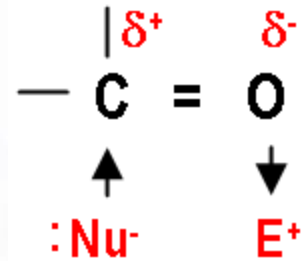
2. Reaksi asil klorida dengan senyawa organologam



3. Pirolisa garam karboksilat



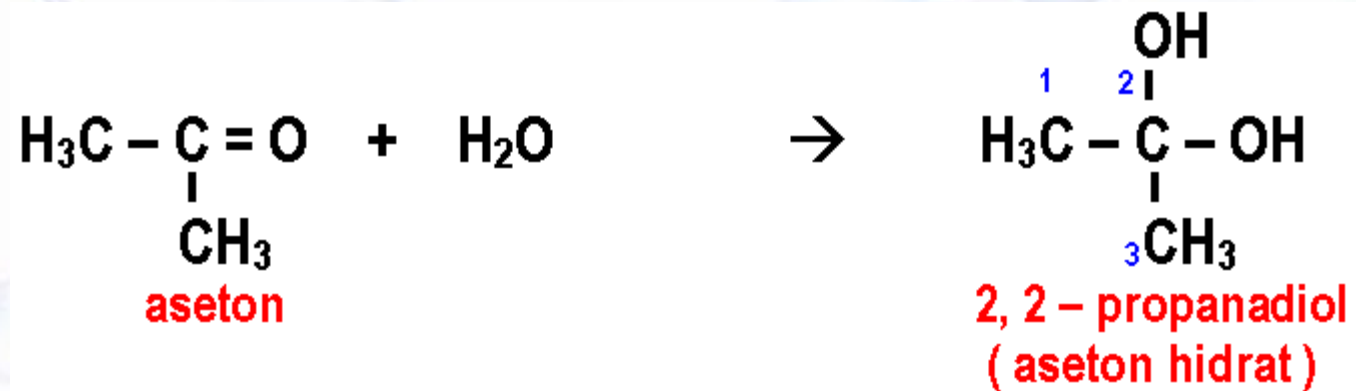
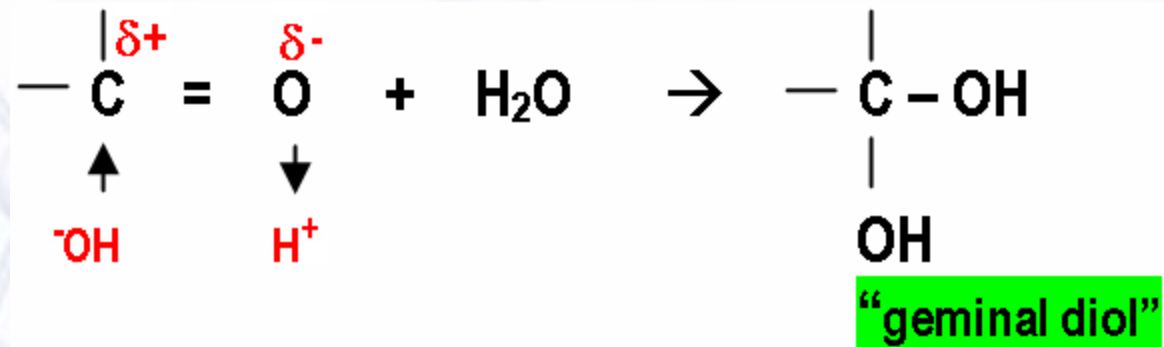
- Sifat Gugus Karbonil



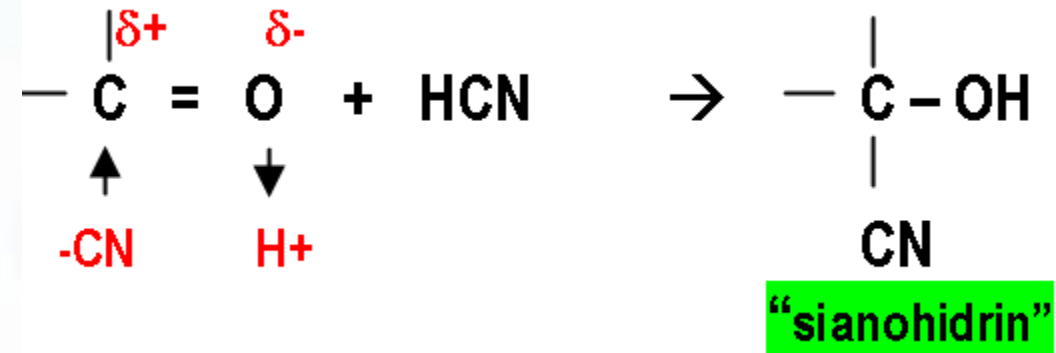
- Gugus -C=O bersifat polar $\rightarrow$ dapat menerima Nu^- atau E^+

- **REAKSI KIMIA :**

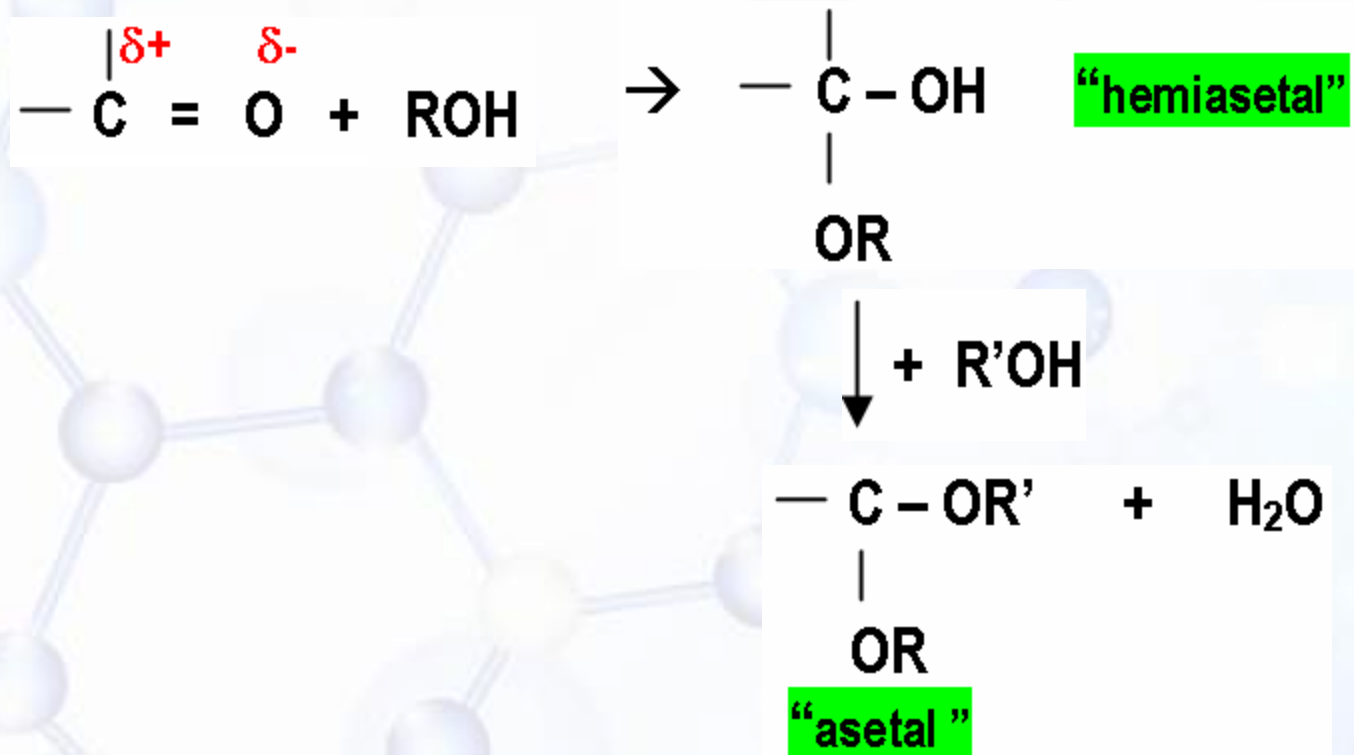
1. Adisi H₂O



2. Adisi nitril (sianida)

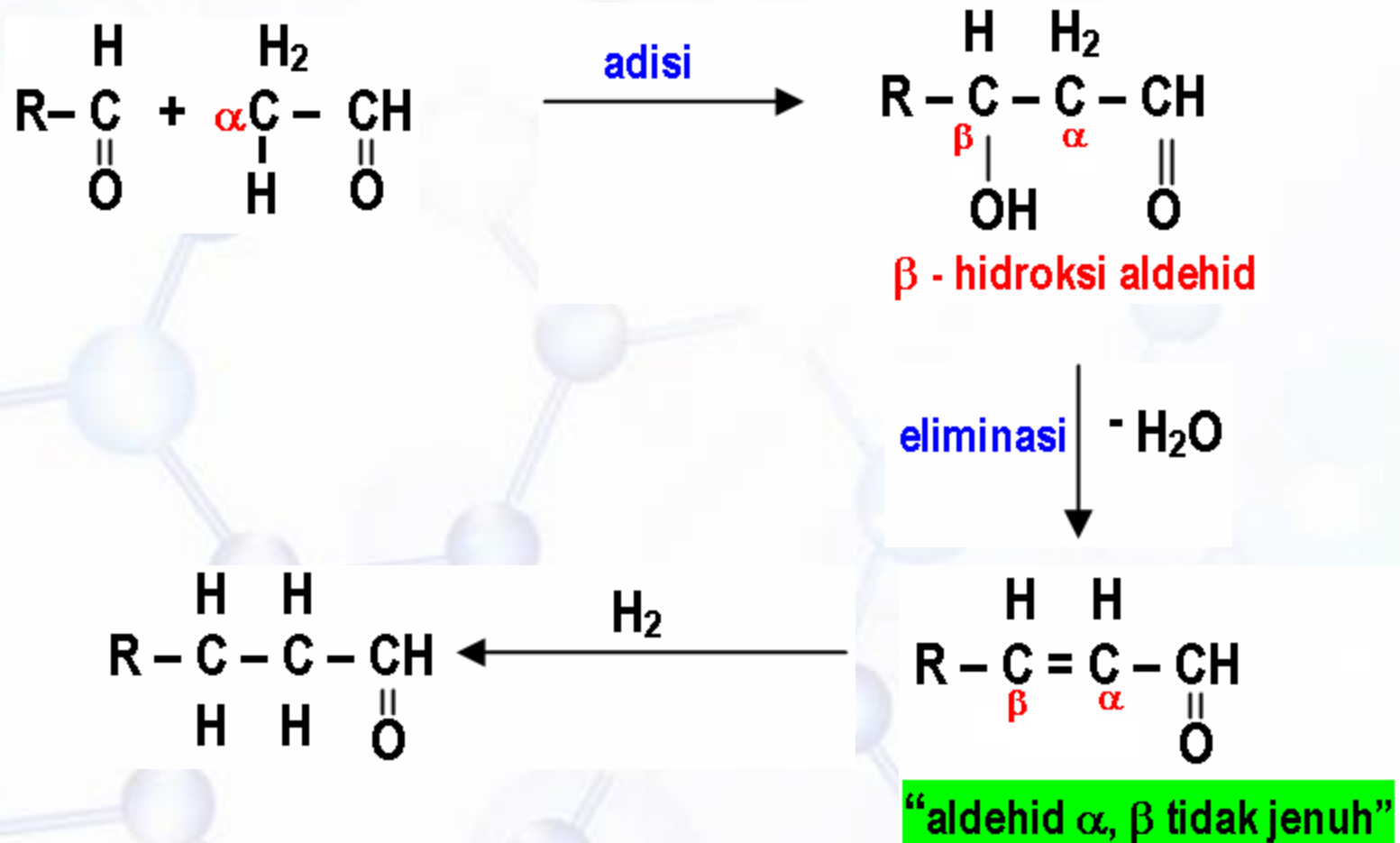


3. Adisi alkohol



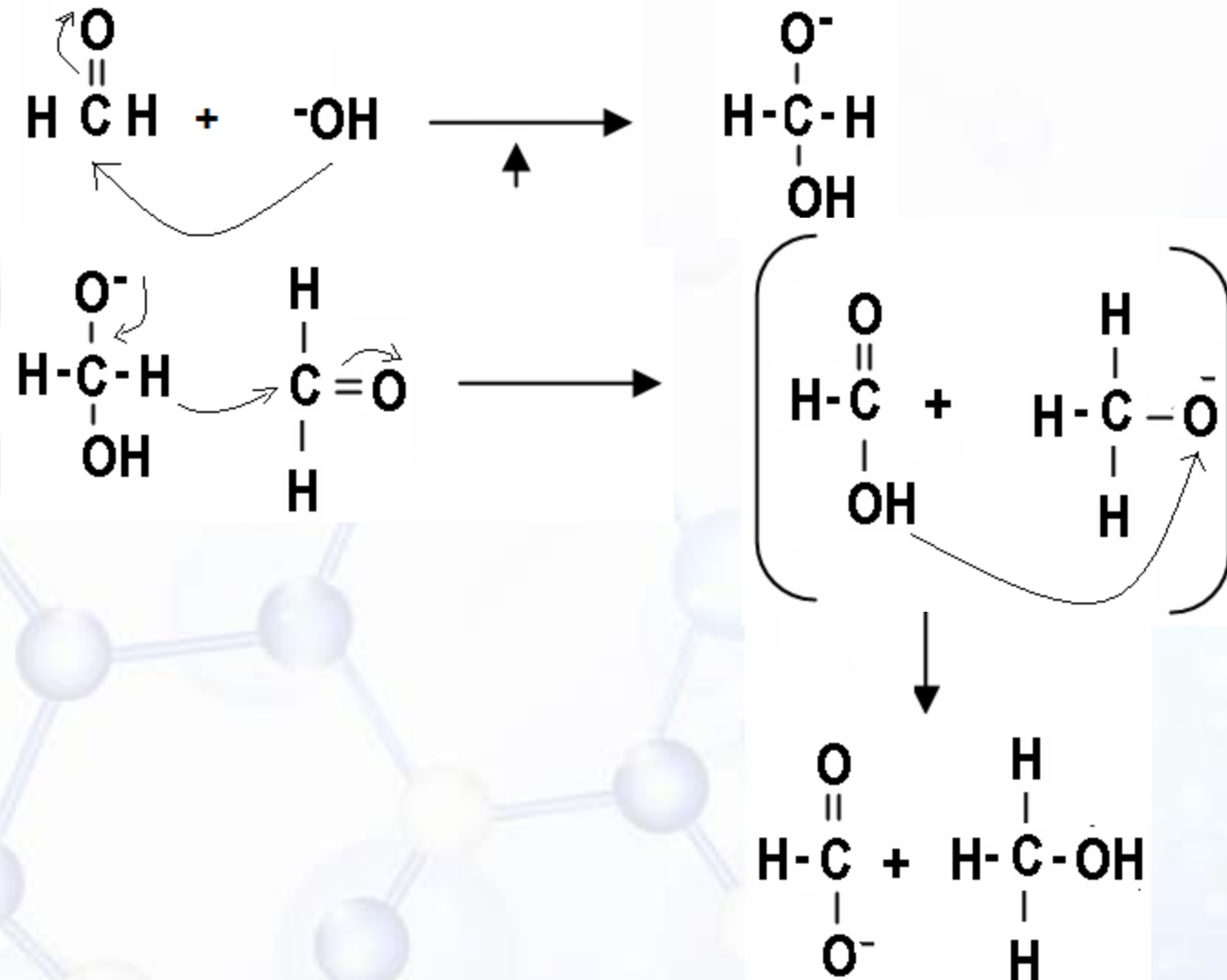
4. Kondensasi Aldol

- Adisi molekul aldehid yang mempunyai α -hidrogen ke molekul aldehid yang lain
(adisi diri / *self addition*)



5. Reaksi Cannizzaro

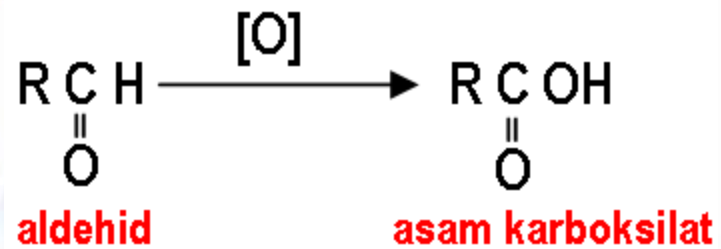
- Dua aldehyd tanpa α -hidrogen dipanaskan dengan larutan hidroksida 50% $\Rightarrow$ separuh aldehyd ter-oksidasi menjadi karboksilat dan separuh ter-reduksi menjadi alkohol:



6. α - Halogenasi



7. Reaksi Oksidasi

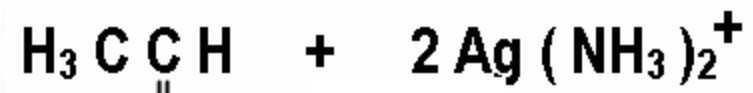


- **Oksidator :**

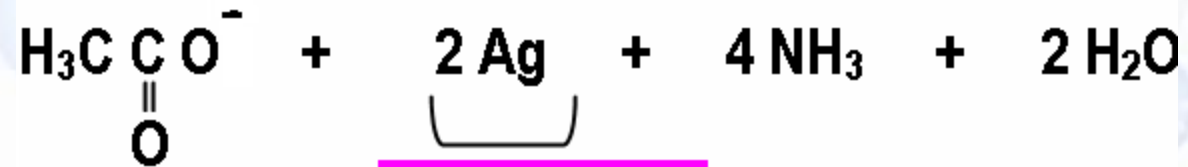
- KMnO_4
- $\text{K}_2\text{Cr}_2\text{O}_7$

- $\text{Ag}(\text{NH}_3)_2^+$ pereaksi Tollens

Test Tollens :

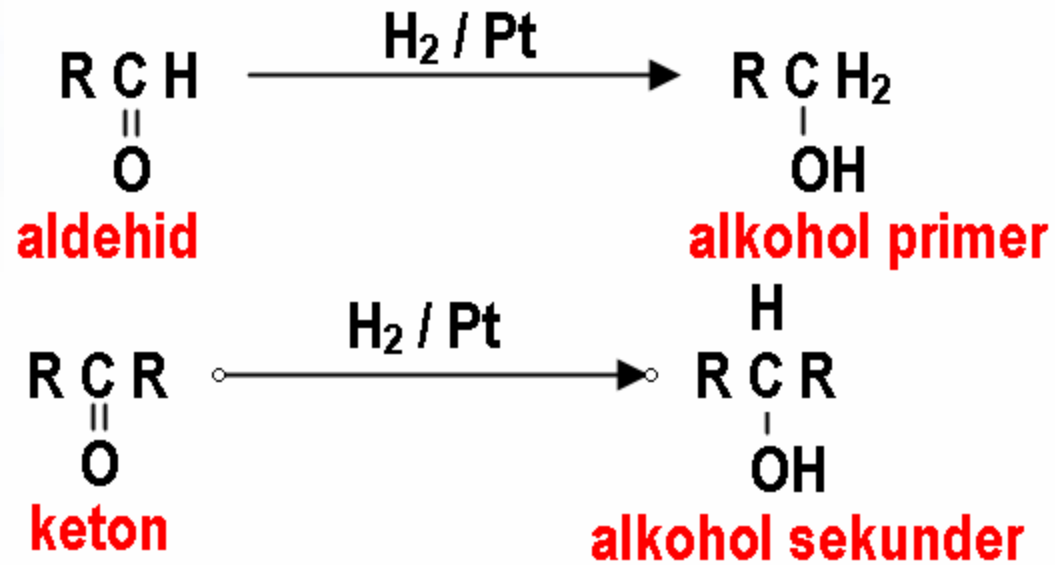


3HO^-



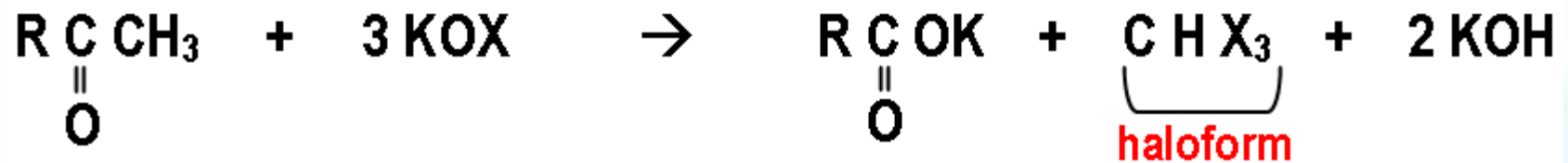
cermin perak

8. Reaksi reduksi

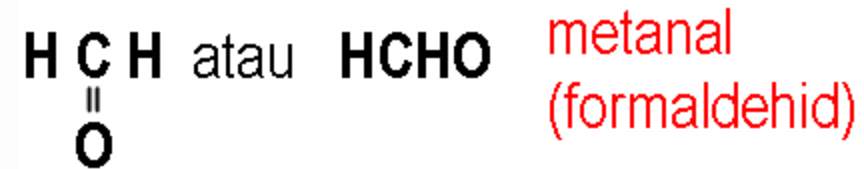


9. Reaksi pembentukan haloform

- Metil keton dioksidasi oleh KOX

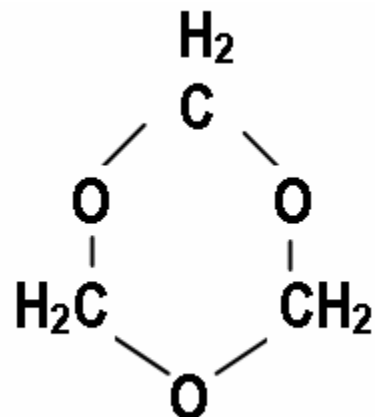


- Cara penyimpanan metanal



Pada suhu kamar berbentuk gas → ada 3 cara penyimpanan :

1. Dilarutkan dalam air
 - Larutan formaldehid dalam air disebut **formalin**
2. Dibuat trimer siklik



TRIOKSAN

3. Dibuat polimer

- **CH₂ O CH₂ O CH₂ O CH₂ O -** **paraformaldehid** (berbentuk padat)

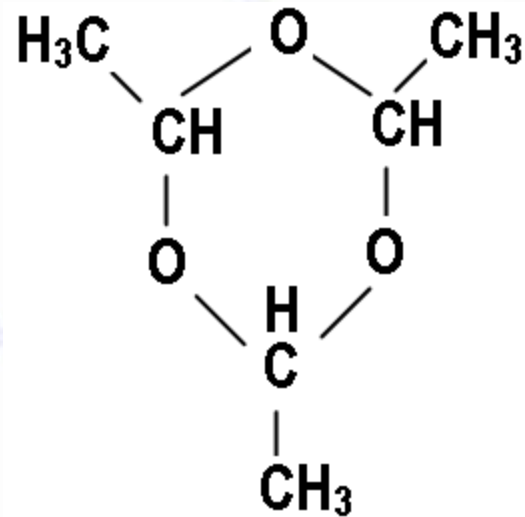
Formalin / Trioksan / Paraformaldehid, bila dipanaskan akan kembali menjadi formaldehid.

- **Cara penyimpanan etanal**



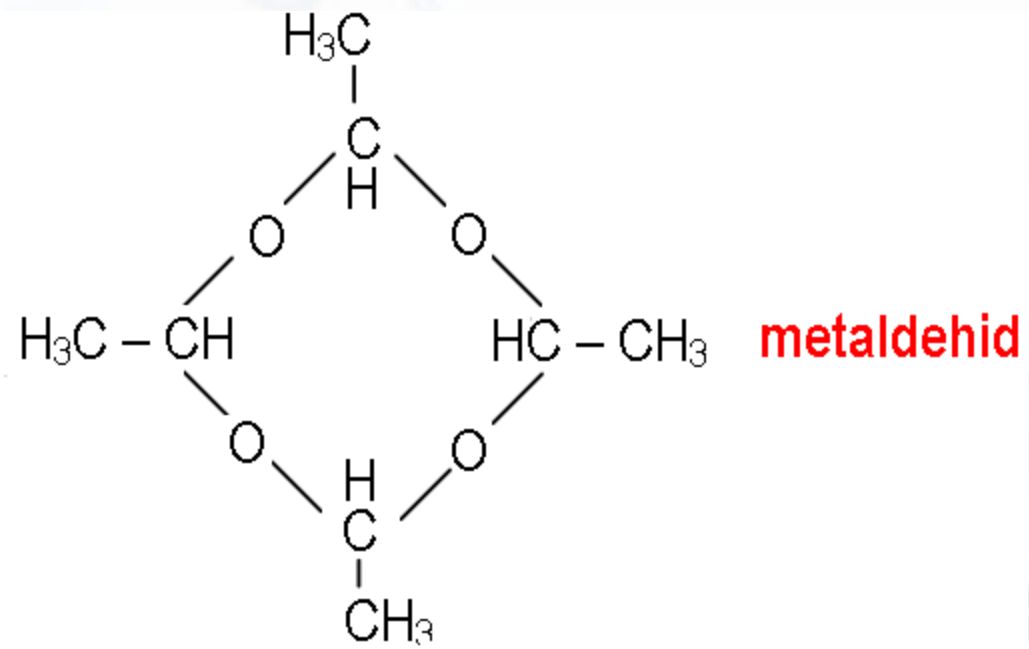
- **TD : 20°C → ada 2 cara penyimpanan :**

1. Dibuat trimer siklik



paraldehid

2. Dibuat tetramer siklik



Paraldehid / Metaldehid bila dipanaskan akan kembali menjadi etanal



TERIMA KASIH
SALAM PANCASILA