1 ald.ket.

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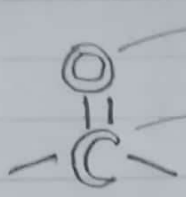
ساعات معتمدة
تربية خاصة / علوم
Basic Organic Chemistry
أساسيات الكيمياء العضوية
نقاط مختصرة ومبسطة (كثيرا).

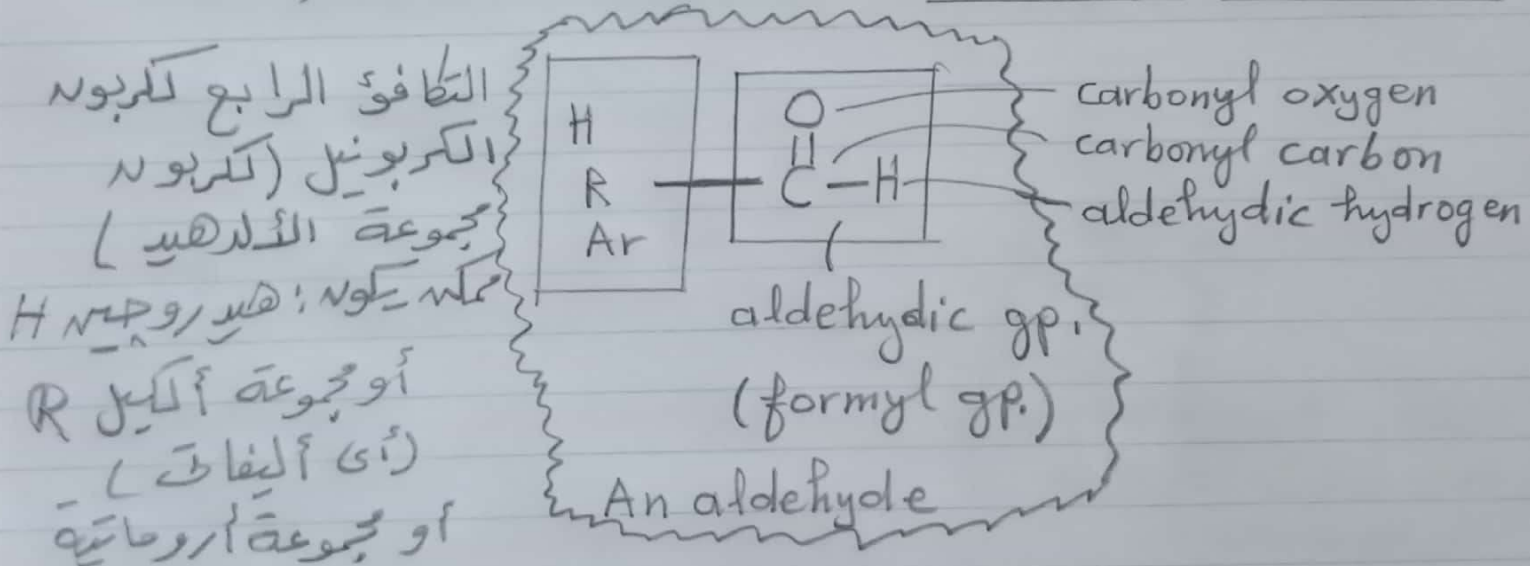
Aldehydes and ketones

مجموعة الكربونيل C=O مشتركة بين الألدهيدات والكيتونات



the carbonyl group

Both aldehydes and ketones contain the carbonyl group, C=O, and are often referred to, collectively, as carbonyl compounds.



طرق كتابة مجموعة الألدهيد:

$$R-\overset{O}{\overset{\|}{C}}-H \quad , \quad R-\overset{H}{\overset{|}{C}}=O \quad , \quad R-\underset{O}{\overset{H}{\underset{|}{\overset{|}{C}}}}-H \quad ,$$

R-CHO ,

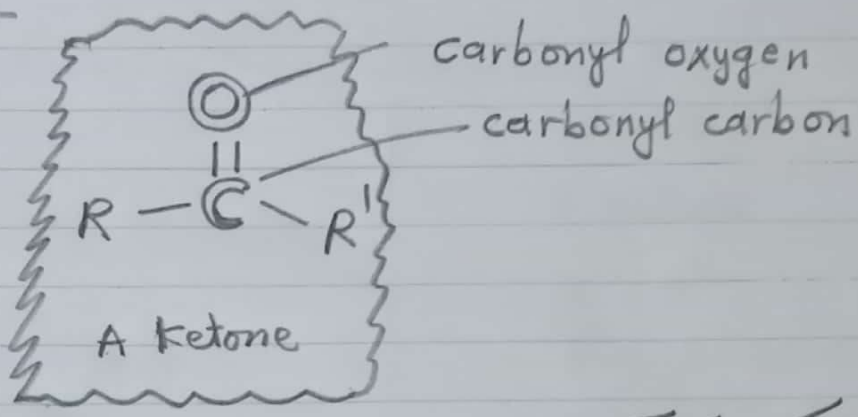
ROH وليس

حيث أنه ROH تتداخل مع الكحولات.

2ald. ket.

Ketones ;

R & R' are ; aliphatic or aromatic gp.s متماثلان أو مختلفان



طريقة كتابة الكيتون :

$R-\overset{O}{\overset{\|}{C}}-R'$, $R'-\overset{O}{\overset{\|}{C}}-R$, $RR'CO$, $OCRR'$,

$R-\overset{O}{\overset{\|}{C}}-R'$, $R'-\overset{O}{\overset{\|}{C}}-R$

The simplest (smallest) ketone contains three carbon atoms :

CH_3COCH_3 $\quad H_3C-\overset{O}{\overset{\|}{C}}-CH_3$ $\quad -\overset{|}{\underset{|}{C}}-\overset{O}{\overset{\|}{C}}-\overset{|}{\underset{|}{C}}-$

alkane ; propane

ketone : Propanone

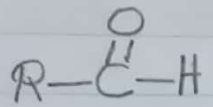
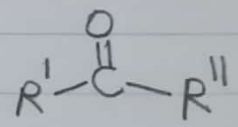
(الألكان المحتوى على نفس عدد ذرات الكربون هو البروبان .)

common name ; acetone

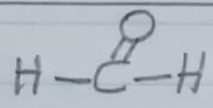
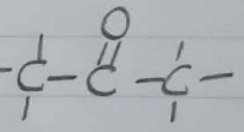
وهو نفسه الأسيتون (المذيب العطوى) المستخدم في إزالة طلاء الأظافر ، والأسيتون العديد من الاستخدامات الأكثر أهمية ، بما فيها الاستخدامات الحربية .

3ald.ket.

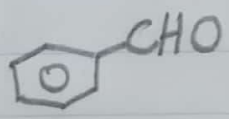
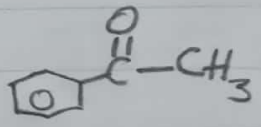
★ مجموعة الكربونيل (C=O) هي التي تحدد (إلى أقصى حد) الخواص الكيميائية لكل من الألدهيدات و الكيتونات.

$RCHO$	$R'COR''$
An aldehyde	A ketone
R= H; aliphatic gp.; aromatic gp.	R', R'': the same or different, aliphatic, or aromatic gp.s
	

It is the carbonyl group that largely determines the chemistry of aldehydes and ketones.

	CH_3COCH_3
$HCHO$	
CH_2O	
Methan**e**	propan**e**
Methan**al**	propan**one**
Formaldehyde	Acetone
the simplest aldehyde, aliphatic, gas, water soluble, polar, colourless, odourant. its water solution is called: Formalin.	the simplest ketone, aliphatic, liquid, water soluble, polar, colourless, odourant, low boiling point (volatile).

4 ald. ket.

Alkane	Aldehyde Alkanal	Ketone Alkanone
CH_4 Methane	HCHO Methanal Formaldehyde	—
CH_3CH_3 Ethane	CH_3CHO Ethanal Acetaldehyde	—
$CH_3CH_2CH_3$ Propane	CH_3CH_2CHO Propanal Propionaldehyde	CH_3COCH_3 Propanone Acetone
 Benzaldehyde		 Benzophenone {Phenyl methyl ketone

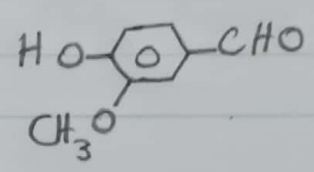
Physical properties of aldehydes and ketones;

Form (state):

Gas; Formaldehyde HCHO is a gas. Its water solution is called (Formalin).

Liquids; Many aldehydes are in the liquid form, e.g., propanal, benzaldehyde, acetone & acetophenone.

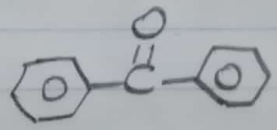
solids; Many aldehydes and ketones are in the solid form, e.g., the aldehyde Vanillin



وهو الألدهيد المستخدم في صناعة بعض المجبوزات (الكحك والبسكويت).

solid ketone وبعض الكيتون الصلب

Benzophenone البنزوفينون



6 ald. ket.

Colour: the gas and liquid aldehydes are colourless. the solid aldehydes are white.

the liquid ketones are colourless and the solides are white.

odour: Aldehydes and ketones have odour(s), the strongest of which is that of formaldehyde.

Polarity: According to the structure, they have medium polarity.

Solubility in water:

$C_1 - C_4$ compounds are soluble in water. Compounds of $\geq C_5$ are weak-to-insoluble in water, e.g. benzaldehyde (insoluble in H_2O).

Faldi Kdi

Solubility in organic solvents;

depending on the chemical structure, aldehydes and ketones dissolve in many organic solvents.

Effect on litmus paper;

Neutral.

melting & boiling points;

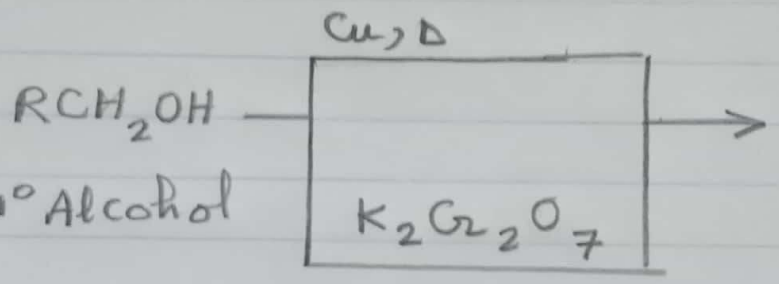
relatively medium, higher than hydrocarbons and lesser than alcohols.

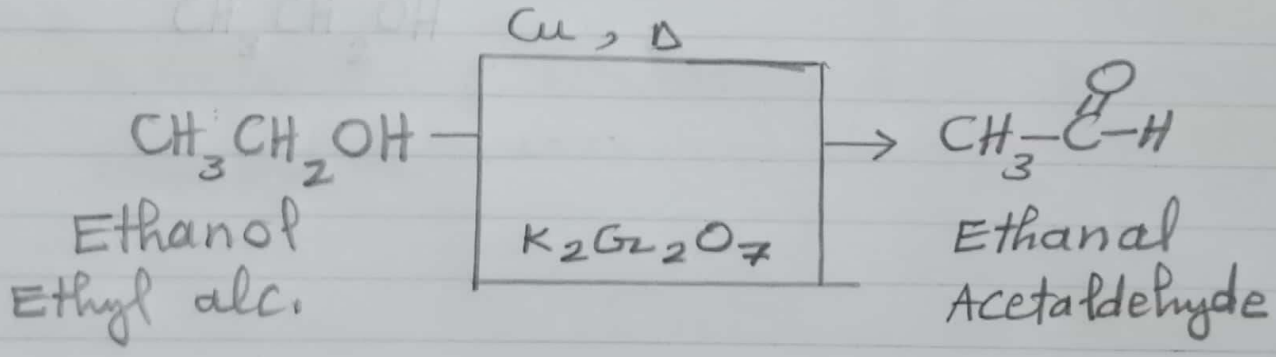
8 ald. ket.

Industrial source :

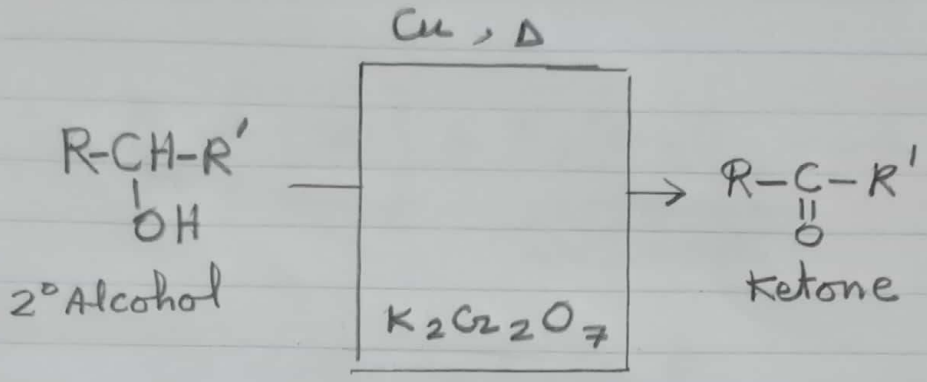
$$\underset{\text{Methanol}}{CH_3OH} + O_2 \xrightarrow[550-600]{Cu,} \underset{\substack{\text{Methanal} \\ \text{Formaldehyde}}}{HCHO} + H_2O$$

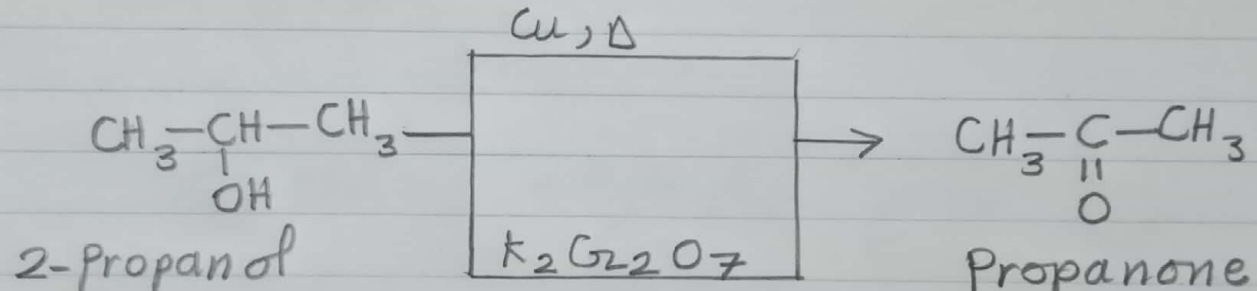
Preparation of aldehyds :





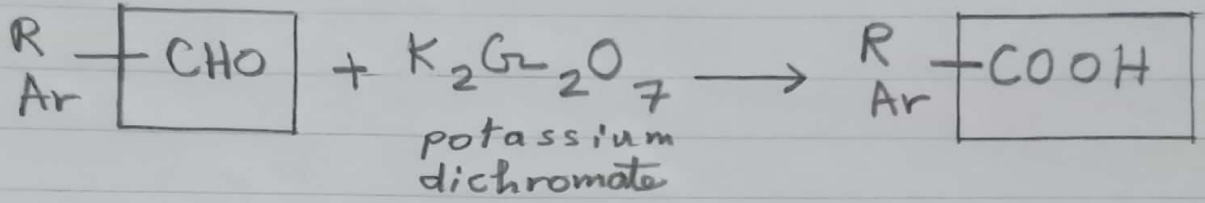
Preparation of ketones ;

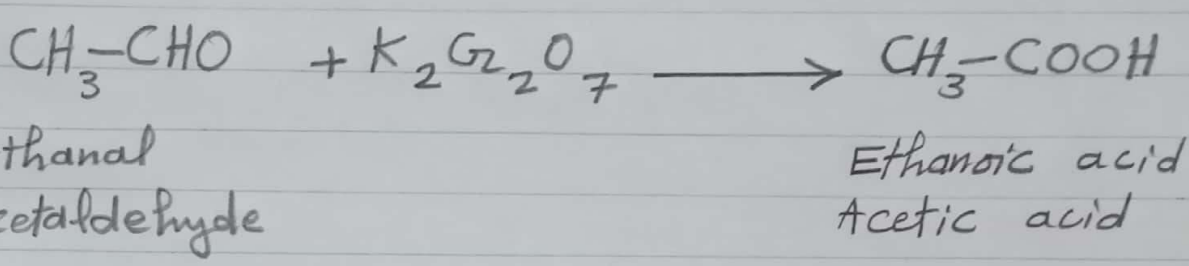


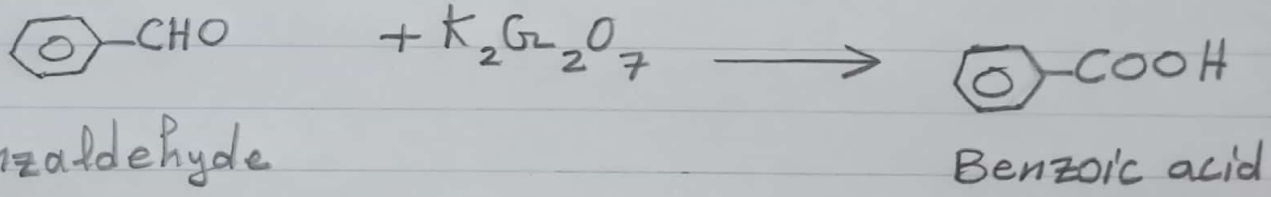


Reactions;

1. Oxidation of aldehydes:







2. Oxidation of ketones; Methyl ketones;