

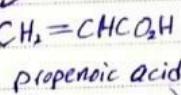
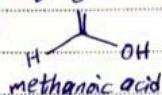
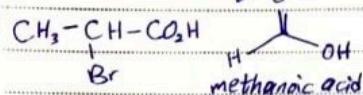
الكتاب المدرسي المنشورة

الكتاب المنشورة

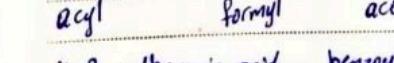
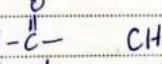
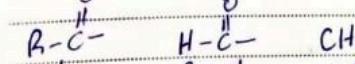
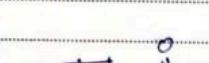
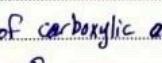
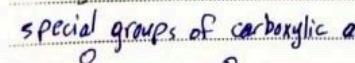
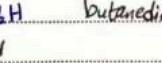
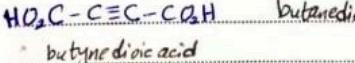
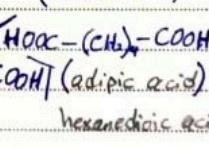
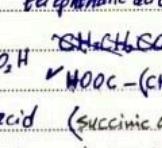
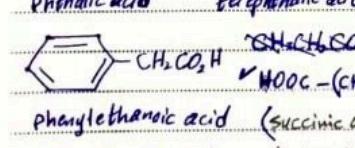
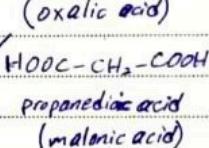
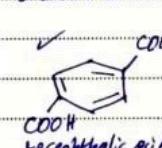
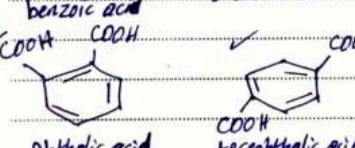
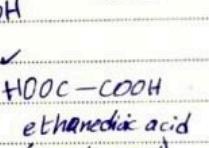
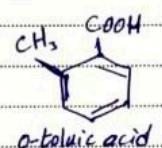
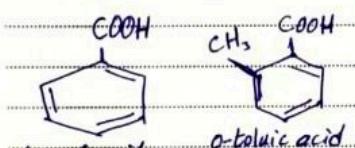
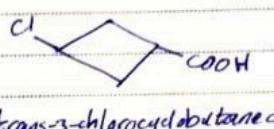
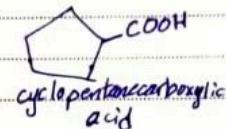
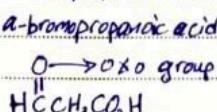
Subject: Carboxylic acids

الكتاب المنشورة

R-COOH carboxylic acid R-C(=O)X carboxylic acid derivative

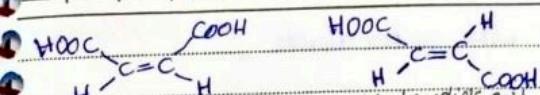


or  $\alpha$ -bromopropanoic acid



العنوان: كيمياء الألكوكيل الكربوكسيلي

Subject: Carboxylic acids



cis-2-butenedioic acid  
(maleic acid)

trans-2-butenedioic acid  
(fumaric acid)

Physical properties of carboxylic acids:-

① have higher boiling points than alcohols, as they form 2 H-bonds between each 2 carboxylic acid molecules.

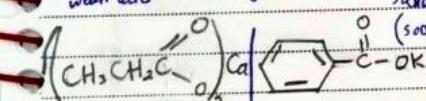
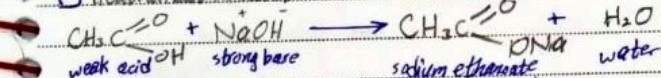
② solubility of carboxylic acids in water is similar to alcohol solubility.

③ carboxylic acids are the most common acids in organic compounds. (weak acids)

لذلك هي أكثر المركبات انتشاراً في المركبات العضوية، لأنها تمتلك قدرة على تكوين حموضات قوية.

Reactions of carboxylic acids:-

① neutralization reactions → salt + H<sub>2</sub>O

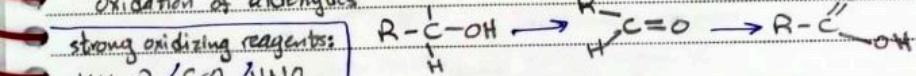


calcium propionate Potassium benzoate

Preparation of carboxylic acids:-

② oxidation of primary alcohols using strong oxidizing reagent → aldehydes

oxidation of aldehydes

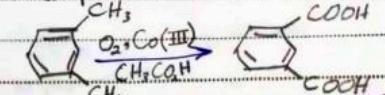
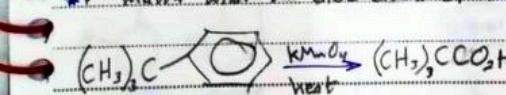


Ag<sub>2</sub>O / K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> / Na<sub>2</sub>C<sub>2</sub>O<sub>4</sub> ③ oxidation of aromatic side chains

for aldehydes only



\* No matter what the side chain of aromatic compounds, it is converted to CO<sub>2</sub>H.



الموارد

جاذب الألياف كحاجة فوجي

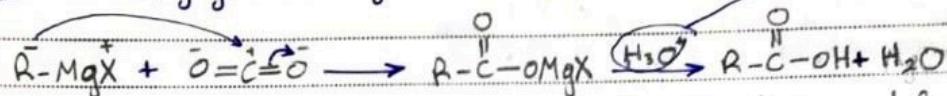
د. محمد العسلي

٢٠١٢، ١، ٢

> Subject: Carboxylic acids

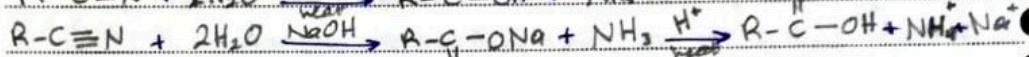
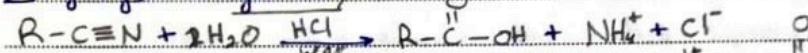
From  $\text{HCl}/\text{H}_2\text{SO}_4$

reaction of grignard reagent with carbon dioxide



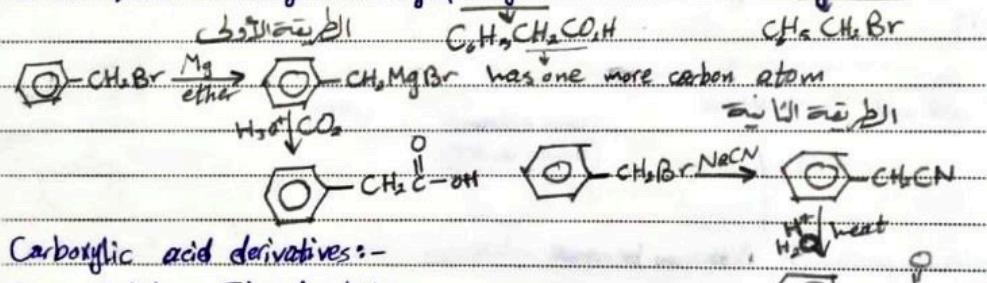
\* the obtained acid has one more carbon atom than the alkyl or aryl from the grignard reagent.

Hydrolysis of cyanides  $\rightarrow \text{R}-\text{C}\equiv\text{N}$



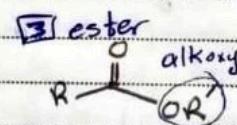
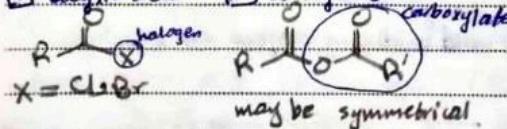
\* The obtained acid has one more carbon atom than the alkyl or aryl from the cyanide.

Write equations for synthesizing phenylacetic acid from benzyl bromide:



Carboxylic acid derivatives:-

1) acylhalides 2) anhydride



4) amide      5) amine      activity: - acylhalide > anhydride > ester > amide

