SLE155 Chemistry for the Professional Sciences

Burwood and Geelong

DEAKIN COLLEGE

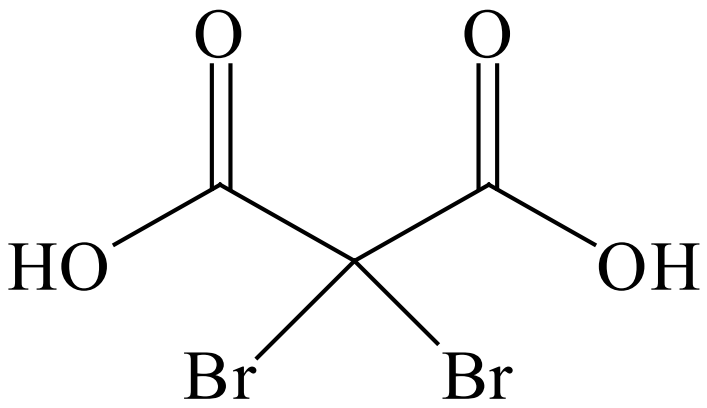
in association with

DEAKIN UNIVERSITY AUSTRALIA

Q 1

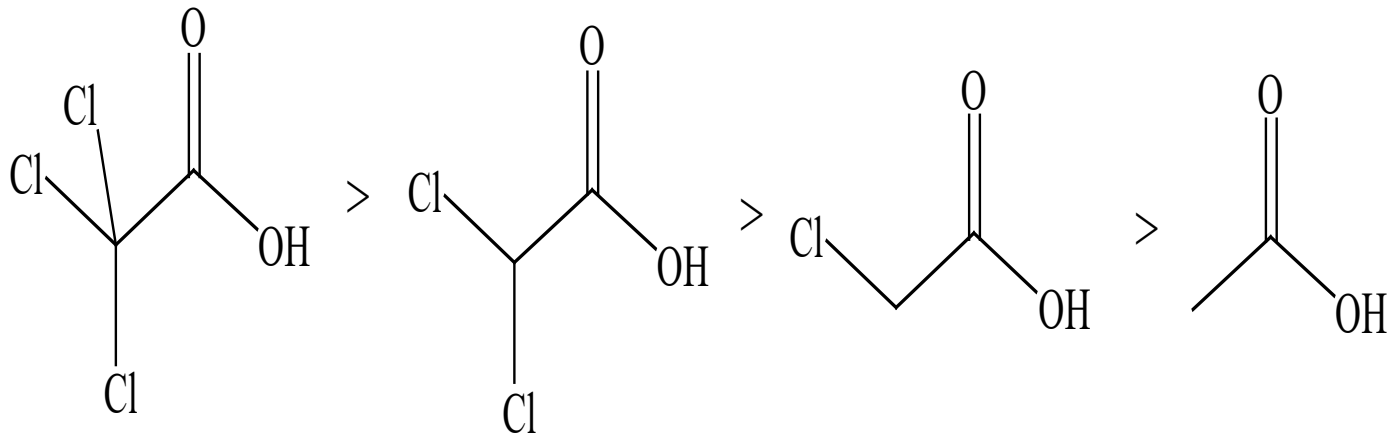
The name of the following compound is 2,2-dibromopropanedioic acid.

***a. True**
b. False



Q 2

The order of acidity of the following carboxylic acids is:



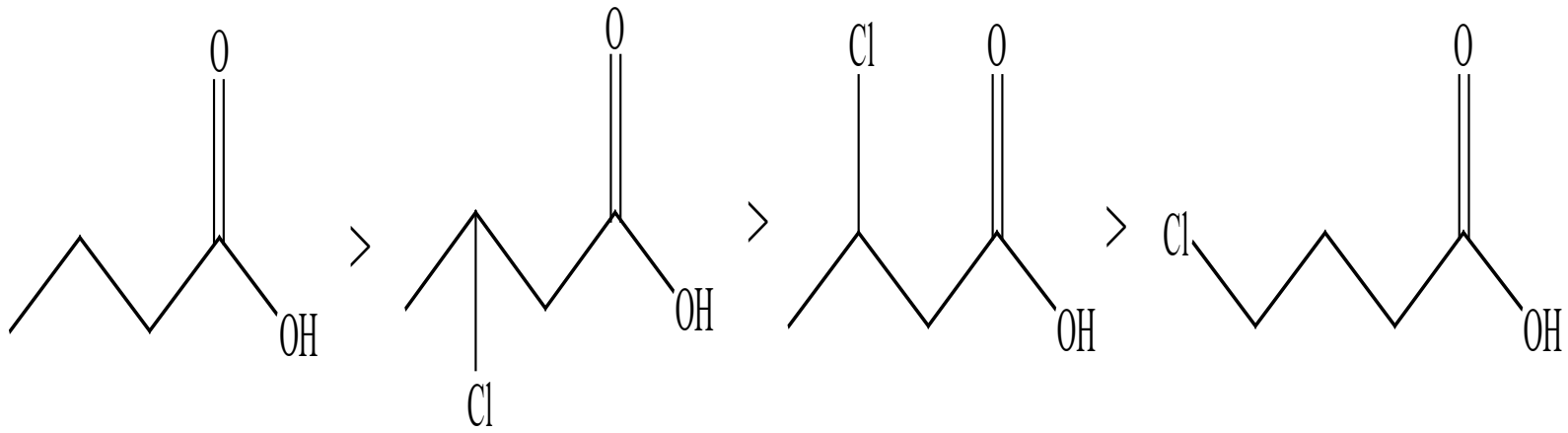
***a. True**
b. False

Q 3

The order of acidity of the following carboxylic acids is:

a. True

*b. False

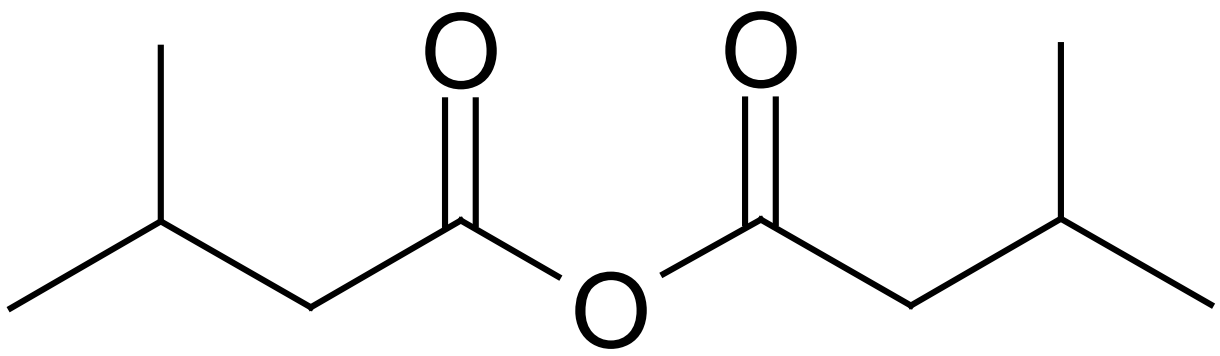


Q 4

The name of the following compound is 3-methylbutanoyl 2-methylbutanoate.

a. True

*b. False



Q 5

- Which is the IUPAC name for the following compound?
-
- a. 4-ketopentanoic acid
- b. methyl butyroxo ketone
- *c. 2-oxohexanoic acid
- d. 5-oxohexanoic acid

Q 6

How would a carboxylic acid be converted to a primary alcohol?

Answer below:

Lithium aluminium hydride will reduce a carboxyl group to a primary alcohol. The reduction is most commonly carried out in diethyl ether or tetrahydrofuran. The initial product is an aluminium alkoxide which is then treated with water to give the primary alcohol.

Q 7

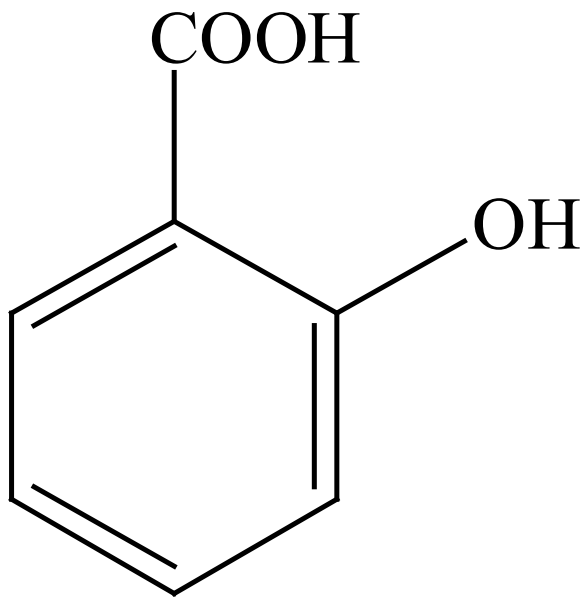
Carboxylic acids are less soluble than are alcohols of comparable molar mass.

a. True

*b. False

Q 8

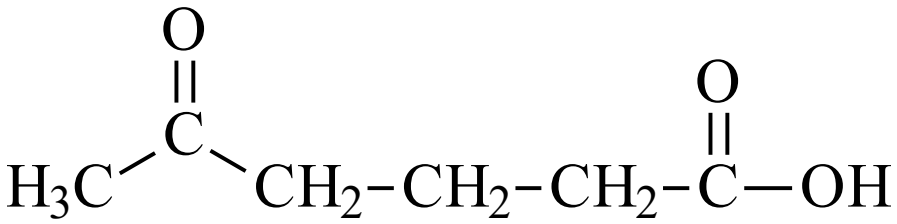
The common name of the following structure is salicylic acid.



***a. True**
b. False

Q 9

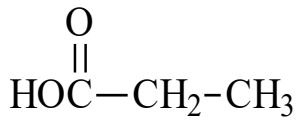
Which is the IUPAC name for the following compound?



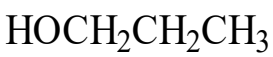
a.4-ketopentanoic acid
b. methyl butyroxo ketone
*c. 2-oxohexanoic acid
d. 5-oxohexanoic acid

Q 10

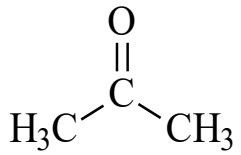
- **Arrange the compounds in order of increasing boiling point (lowest first).**



I



II



III

IV

a. I, II, III, IV
***b. II, III, I, IV**
c. IV, II, II, I
d. I, II, IV, III

Q 11

Which conditions will convert pentanoic acid to pentanoyl chloride?

a. $SOCl_2$

*b. HCl

c. NaCl

d. $LiAlH_4$ followed by HCl

Q 12

What is the order of decreasing reactivity toward nucleophilic acyl substitution for these carboxylic acid derivatives (most reactive first)?

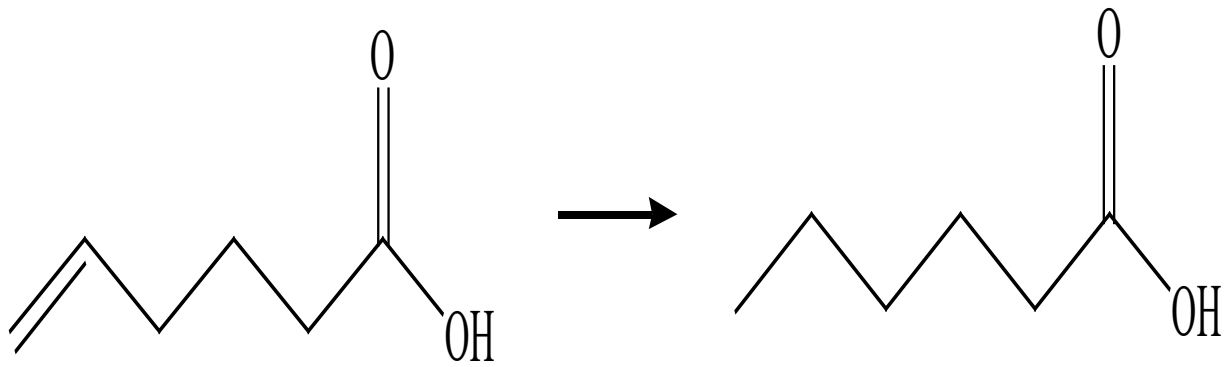
I II III IV

- a. III, IV, I, II
- b. IV, I, II, III
- *c. II, IV, I, III
- d. I, II, III, IV

Q 13

What reagent/s is required for the following conversion?

a. $NaBH_4$
b. H_2O
***c. H_2/metal**
d. $LiAlH_4$



Q 14

Why are carboxylic acids more soluble in water than alcohols of comparable molar mass?

Answer below:

Their increased solubility is due to hydrogen bonding between the carbonyl and hydroxyl molecules and water. Alcohols don't have a carbonyl group, so their hydrogen bonding is less. As molar mass increases, the carboxylic acid becomes less soluble in water.