

Home Gameboard Chemistry Organic Organic Reactions Chloro Compound

# **Chloro Compound**



A compound  $\bf A$ ,  $C_3H_5O_2Cl$ , after boiling for half an hour with aqueous acid, yielded compounds  $\bf B$ ,  $C_2H_3O_2Cl$ , and  $\bf C$ ,  $CH_4O$ . Boiling  $\bf A$  for half an hour with aqueous sodium hydroxide, yielded compounds  $\bf D$ ,  $C_2H_3O_3Na$ , and  $\bf C$ .

When compound **B** was boiled with aqueous sodium hydroxide, and the mixture acidified, it gave **E**,  $HOCH_2CO_2H$ . Treatment of **E** with aqueous sodium carbonate resulted in a vigorous effervescence as **E** was converted into **D**.

Deduce the structures of compounds  ${\bf A}$  to  ${\bf D}$  inclusive.

Use the structure editor to generate SMILES strings as your answers.

Part A	Compound A			
Cor	mpound <b>A</b> is:			
Part B	Compound B			
Cor	mpound <b>B</b> is:			
Part C	Compound C			
Cor	mpound <b>C</b> is:			

Part D	Compound D
The	e <i>anion</i> of compound <b>D</b> is:
Part E	E and C reaction
Wh	at product would be obtained when compounds <b>E</b> and <b>C</b> react together?
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Home Gameboard Chemistry Organic Organic Reactions Fruit Alcohols

## **Fruit Alcohols**



Alcohol **A** has esters which are responsible for the flavours of various fruits and has the molecular formula  $C_5H_{12}O$ . Reaction of **A** with acidified potassium dichromate(VI) produces a compound **B**,  $C_5H_{10}O_2$ . Heating **A** over  $Al_2O_3$  produces **C**,  $C_5H_{10}$ . Reaction of **C** with hydrogen bromide forms 3-bromo-2-methylbutane as one of the products.

Suggest structures for A, B and C.

Use the <u>structure editor</u> to generate a SMILES string.

#### Part A Alcohol A

Suggest a structure for alcohol A.

Use the structure editor to generate a SMILES string.

### Part B Compound B

Suggest a structure for compound **B**.

Use the structure editor to generate a SMILES string.

### Part C Compound C

Suggest a structure for compound **C**.

Use the structure editor to generate a SMILES string.



Home Gameboard Chemistry Organic Organic Reactions Geraniol

## Geraniol



**Geraniol**,  $C_{10}H_{18}O$ , has a rose-like odour and is present in many plants including *Pelargonium odorantissimum*; it has a melting point of  $77^{\circ}C$  and a boiling point of  $230^{\circ}C$ .

It is easily oxidised by acidified potassium dichromate(VI), first to **citral**  $C_{10}H_{16}O$ , then to **geranic acid**,  $C_{10}H_{16}O_2$ . Prolonged oxidation of geraniol yields a variety of products, the principal ones being **propanone**, **ethanedioic acid** and **4-oxopentanoic acid**,  $CH_3COCH_2CH_2CO_2H$ .

One mole of geraniol absorbs two moles of hydrogen when reduced in the presence of a platinum catalyst to give **3,7-dimethyloctanol**; under milder conditions only one mole of hydrogen is absorbed to give **citronellol**, which occurs naturally as an optically active compound but is optically inactive when prepared by reduction of geraniol.

#### Part A 3,7-dimethyloctanol

Draw the structure of 3,7-dimethyloctanol.

Use the <u>structure editor</u> to generate a SMILES string.

#### Part B Gernaniol

Suggest a likely structure of geraniol.

Use the <u>structure editor</u> to generate a SMILES string.

Give the structure of citral.
Use the structure editor to generate a SMILES string.
Part D Geranic acid
Give the structure of geranic acid.
Use the structure editor to generate a SMILES string.
Part E Citronellol
Give the structure of citronellol.
Use the structure editor to generate a SMILES string.
Adopted with a consission from UCLES Adopted Chamista, Newspales 4000 Capacial Bones Overtice O

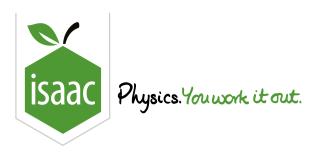
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Gameboard:

Part C Citral

STEM SMART Chemistry Week 48 (extension)

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<u>Home</u> <u>Gameboard</u> Chemistry Organic Isomerism Perfumery

# Perfumery



The esters of alcohol **J** are used in the perfumery industry. The alcohol exhibits optical isomerism. When treated with hot concentrated sulfuric acid, each optical isomer of **J** produces three substances **K**, **L** and **M**, which are isomers of each other. Only a small quantity of **M** is produced. Both **K** and **L** react with bromine to give 1,2-dibromo-1-phenylpropane, whereas **M** with the same reagent gives 2,3-dibromo-1-phenylpropane.

### Part A Compound J

Suggest a structure for alcohol **J**.

Draw the structure using the <u>structure editor</u> and give your answer as a SMILES string.

#### Part B Compounds K and L

Suggest structures for compounds **K** and **L**.

Draw the structures using the <u>structure editor</u> and give your answer as SMILES strings in the format A, B (space after comma).

#### Part C Compound M

Suggest a structure for compound M.

Draw the structure using the structure editor and give your answer as a SMILES string.

What type of isomerism do compounds <b>K</b> and <b>L</b> show with respect to each other?
Structural Isomerism - Chain
Stereoisomerism - Geometric
Structural Isomerism - Position
Structural Isomerism - Functional
Stereoisomerism - Optical
Part E Isomerism M and L
What type of isomerism do compounds <b>M</b> and <b>L</b> show with respect to each other?
Stereoisomerism - Optical
Structural Isomerism - Chain
Structural Isomerism - Position
Structural Isomerism - Functional
Stereoisomerism - Geometric
Part F J $\longrightarrow$ K, L, M reaction
What type of reaction does alcohol <b>J</b> undergo to produce compounds <b>K</b> , <b>L</b> and <b>M</b> ?
what type of reaction does alcohol <b>s</b> undergo to produce compounds <b>ix</b> , <b>L</b> and <b>ivi</b> ?

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Part D

Isomerism K and L

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