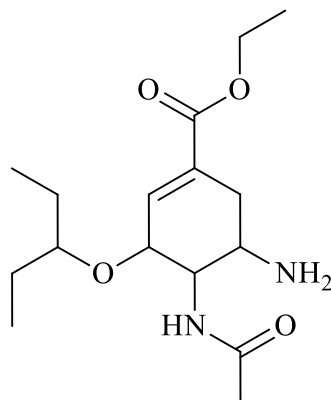


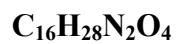
- Oseltamivir, marketed under the trade name Tamiflu, is an antiviral drug, which may slow the spread of influenza (flu) virus between cells in the body by stopping the virus from chemically cutting ties with its host cell.

Marks
2

Tamiflu



Give the molecular formula of Tamiflu.



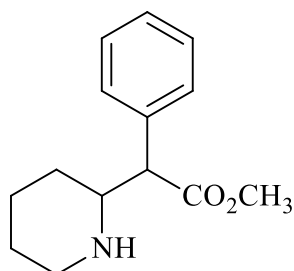
List the functional groups present in Tamiflu.

alkene, amide, ester, ether, primary amine

- Methylphenidate, also known as Ritalin, is a psychostimulant drug approved for treatment of attention-deficit disorder. It belongs to the piperidine class of compounds and increases the levels of dopamine and norepinephrine in the brain through reuptake inhibition of the monoamine transporter.

Marks
7

methylphenidate



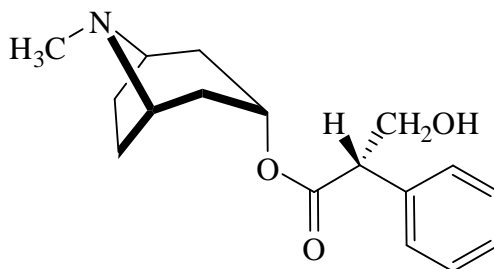
Give the molecular formula of methylphenidate.

C₁₄H₁₉NO₂

List the functional groups present in methylphenidate.

Aromatic ring, ester, secondary amine

- The tropane alkaloid (-)-hyoscyamine is found in certain plants of the *Solanaceae* family. It is an anticholinergic agent that works by blocking the action of acetylcholine at parasympathetic sites in smooth muscle, secretory glands and the central nervous system.



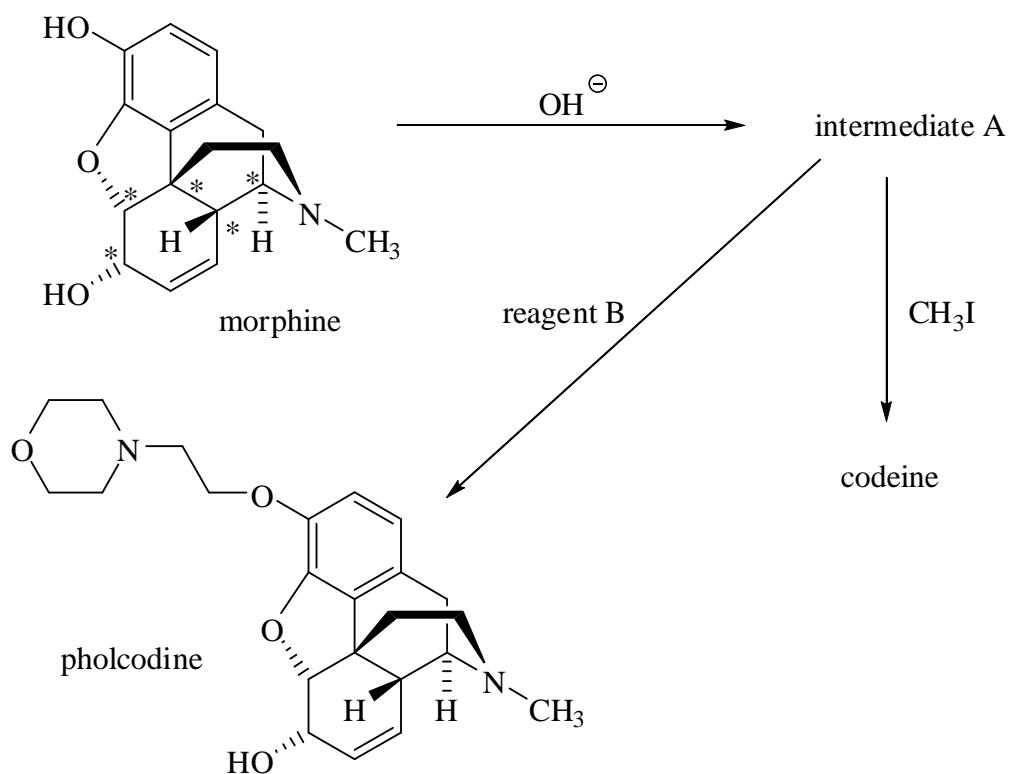
Give the molecular formula of (-)-hyoscyamine.

C₁₇H₂₃O₃N

List the functional groups present in (-)-hyoscyamine.

amine, alcohol, ester, aromatic ring (arene)

- Morphine is the principal active agent in opium and is a highly potent analgesic drug. Its structure and conversion into codeine (a moderate analgesic) and pholcodine (a cough suppressant) are shown below.



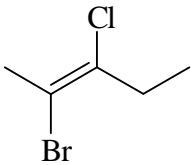
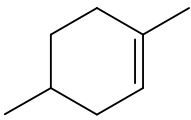
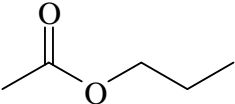
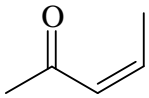
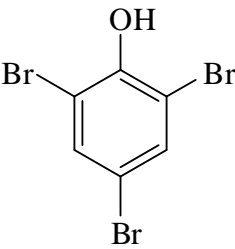
Give the molecular formula of morphine.

$\text{C}_{17}\text{H}_{19}\text{O}_3\text{N}$

Identify the functional groups present in morphine.

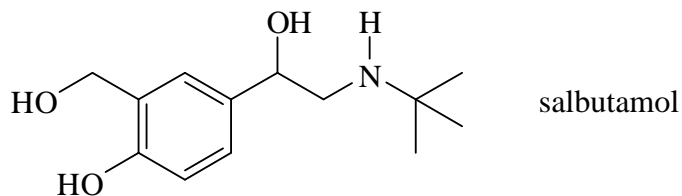
phenol, amine, alcohol, ether, alkene

- Name the following compounds. Make sure you include stereochemical descriptors where appropriate.

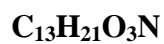
	<p>(E)-2-bromo-3-chloro-2-pentene</p> <p>(E as the highest ranking substituents (Cl and Br) are on opposite sides of C=C bond)</p>
	<p>1,4-dimethylcyclohexene</p>
	<p>propyl acetate</p>
	<p>(Z)-3-penten-2-one</p> <p>(Z as highest ranking substituents (CH₃ and COCH₃) are on the same side of C=C bond)</p>
	<p>2,4,6-tribromophenol</p>

Marks
2

- Salbutamol is available under the trade name Ventolin® as a racemic mixture of compounds. A stick representation of the compound is shown below.



Give the molecular formula of salbutamol.

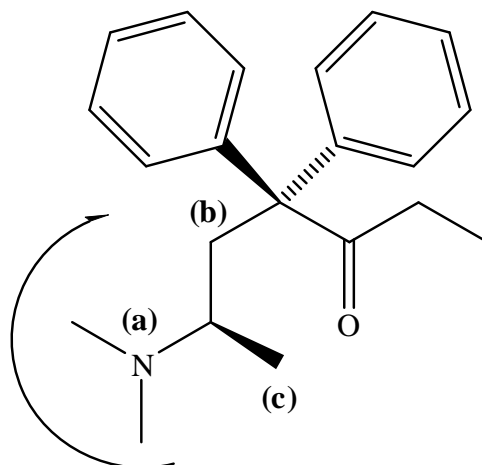


List the functional groups present in salbutamol.

alcohol (primary and secondary), phenol, amine (secondary)

Marks
2

- A stick representation for the active enantiomer of methadone, an analgesic used as a maintenance drug in the treatment of heroin addiction, is shown below.



Give the molecular formula of methadone.

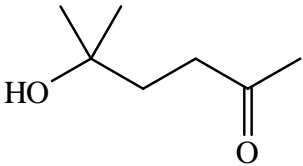
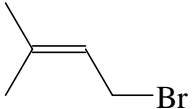
C₂₁H₂₇NO

List the functional groups present in methadone.

tertiary amine, ketone, arene (aromatic ring)

Marks
2

- Name the following compounds.

	5-hydroxy-5-methyl-2-hexanone or 5-hydroxy-5-methylhexan-2-one
	1-bromo-3-methyl-2-butene or 1-bromo-3-methylbut-2-ene