B.Sc Sem – IV
Chemistry Honours
Paper : SEC – 2
Pharmaceutical Chemistry

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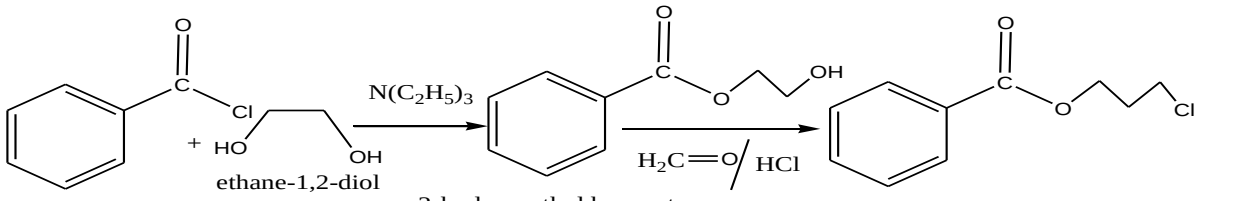
Synthesis of Acyclovir (A Antiviral Agent)

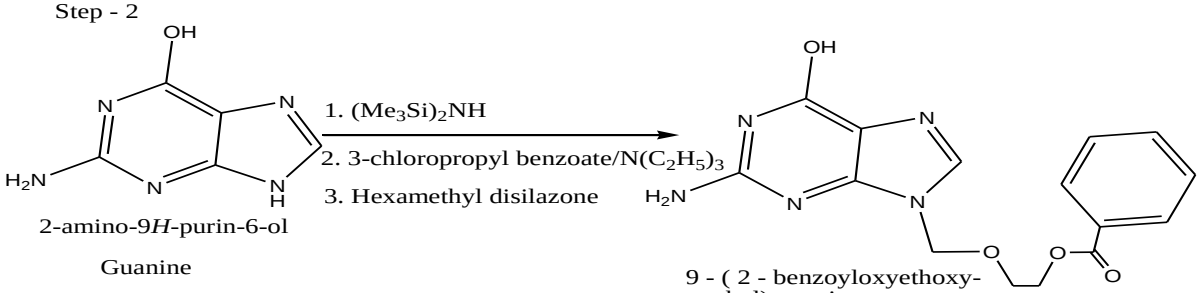
Method - 1

Step - I



benzoyl chloride + ethane-1,2-diol → 2-hydroxyethyl benzoate or 2 - benzoyloxy ethanol → 3-chloropropyl benzoate Or 1 - benzoyloxy - 2 - chloro methoxy ethane

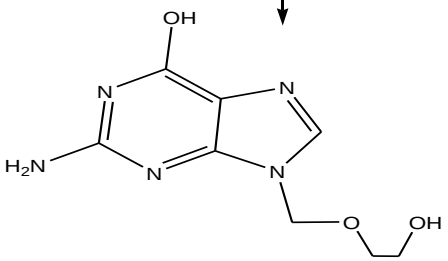
Step - 2



2-amino-9*H*-purin-6-ol
Guanine

9 - (2 - benzoyloxyethoxy-methyl) guanine

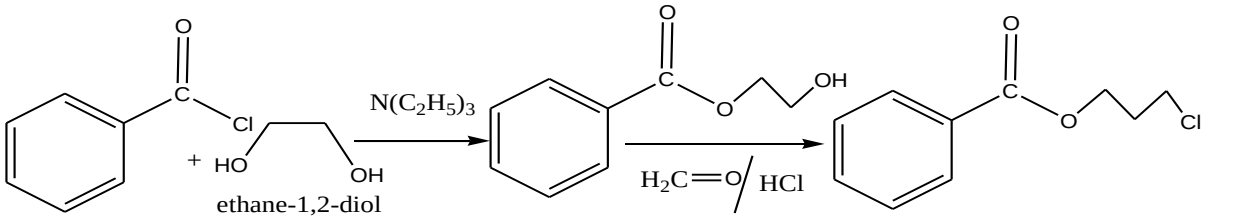
NH_3/CH_3OH



9-((2-hydroxyethoxy)methyl)-2-amino-9*H*-purin-6-ol
Or
Acyclovir

Method - 2

Step - I



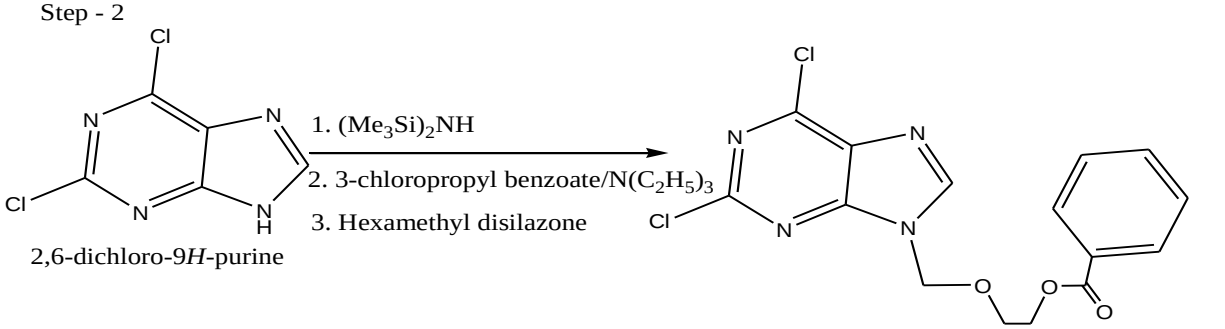
benzoyl chloride

ethane-1,2-diol

2-hydroxyethyl benzoate
or
2 - benzoyloxy ethanol

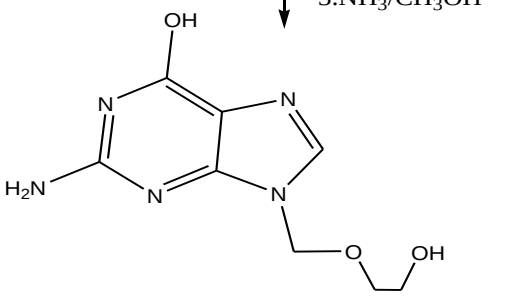
3-chloropropyl benzoate
Or
1 - benzoyloxy - 2 - chloro methoxy ethane

Step - 2



2,6-dichloro-9*H*-purine

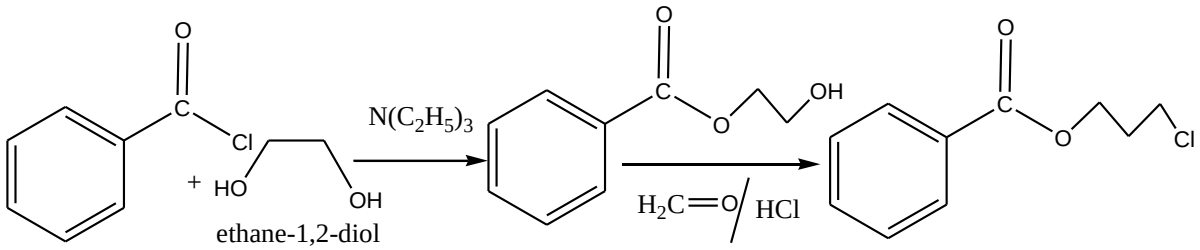
2-((2,6-dichloro-9*H*-purin-9-yl)methoxy)ethyl benzoate



9-((2-hydroxyethoxy)methyl)-2-amino-9*H*-purin-6-ol
Or
Acyclovir

Method - 3

Step - I



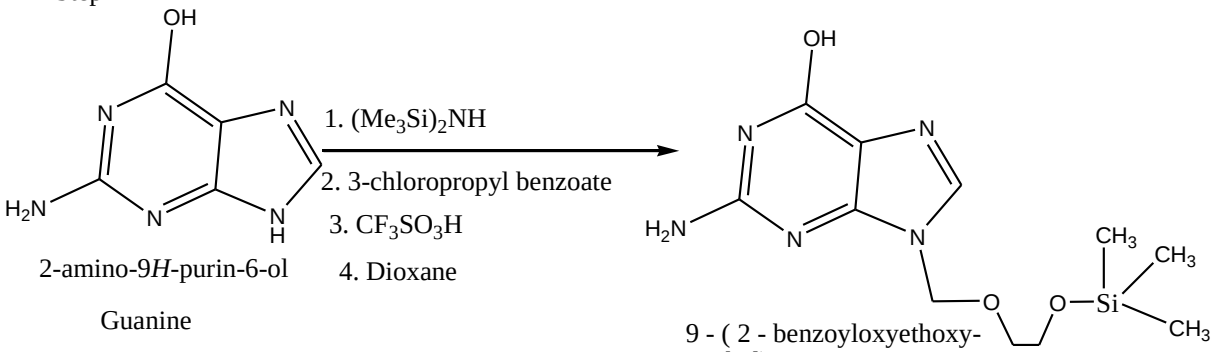
benzoyl chloride

ethane-1,2-diol

2-hydroxyethyl benzoate
or
2 - benzoyloxy ethanol

3-chloropropyl benzoate
Or
1 - benzoyloxy - 2 - chloro methoxy ethane

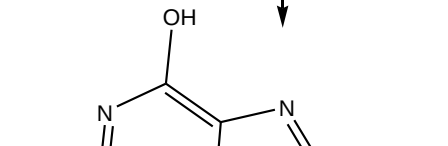
Step - 2



2-amino-9*H*-purin-6-ol

Guanine

9 - (2 - benzoyloxyethoxy-methyl) guanine



9-((2-hydroxyethoxy)methyl)-2-amino-9*H*-purin-6-ol
Or
Acyclovir

Uses. Acyclovir is used to treat **infections** caused by certain types of **viruses**. It treats **cold sores** around the mouth (caused by **herpes** simplex), shingles (caused by **herpes** zoster), and **chickenpox**. This medication is also used to treat outbreaks of genital **herpes**.

How does acyclovir work?

Acyclovir is in a class of antiviral medications called synthetic nucleoside analogues. It **works** by stopping the spread of the herpes virus in the body. **Acyclovir** will not cure genital herpes and may not stop the spread of genital herpes to other people.

What are the side effects for acyclovir?

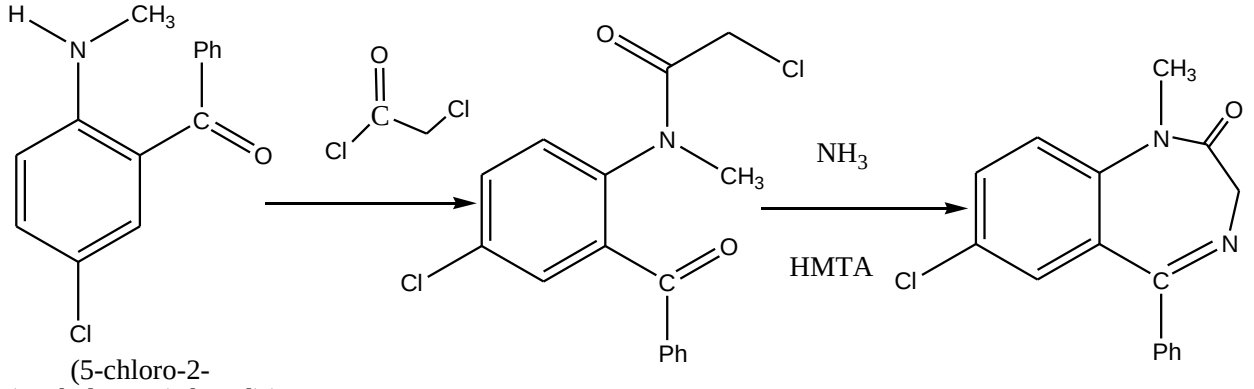
Side effects that may be seen in all people using acyclovir include:

- Nausea.
- Diarrhea.
- Vomiting.
- Headache.
- Dizziness.
- Tiredness.
- Muscle or joint aches.
- Visual changes.

Synthesis of Diazapam

Method - 1

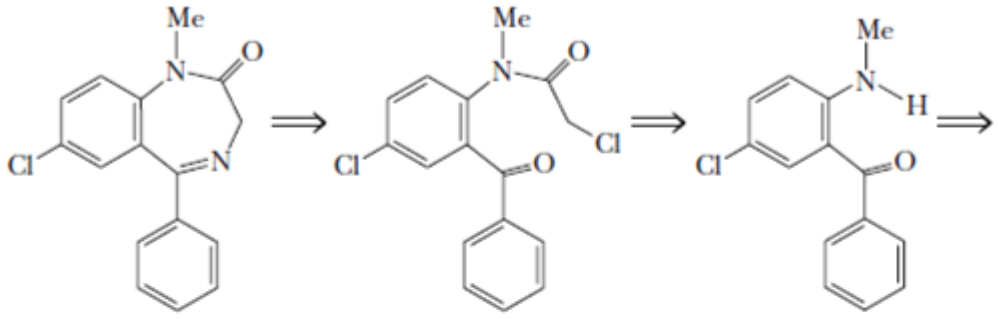
Diazepam is generic name and valium is brand name



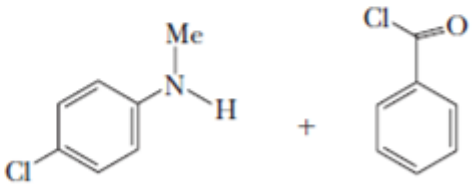
(5-chloro-2-(methylamino)phenyl)(phenyl)methanone

Diazepam

Retro Synthesis Of Diazepam



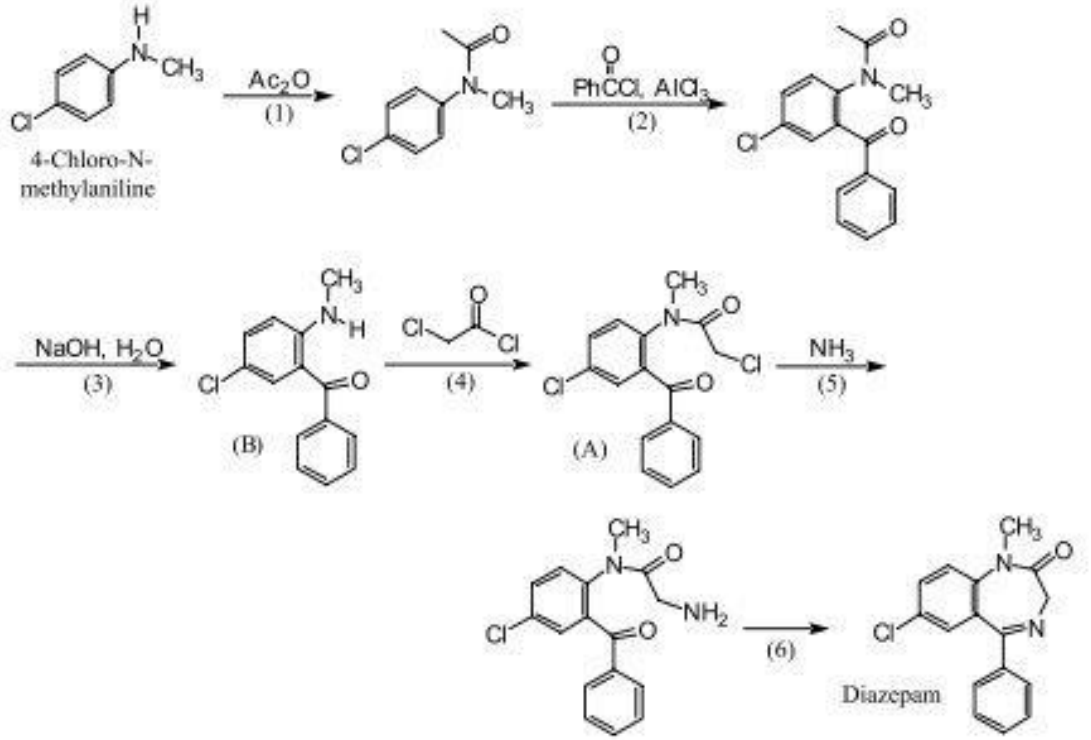
Diazepam **(A)** **(B)**



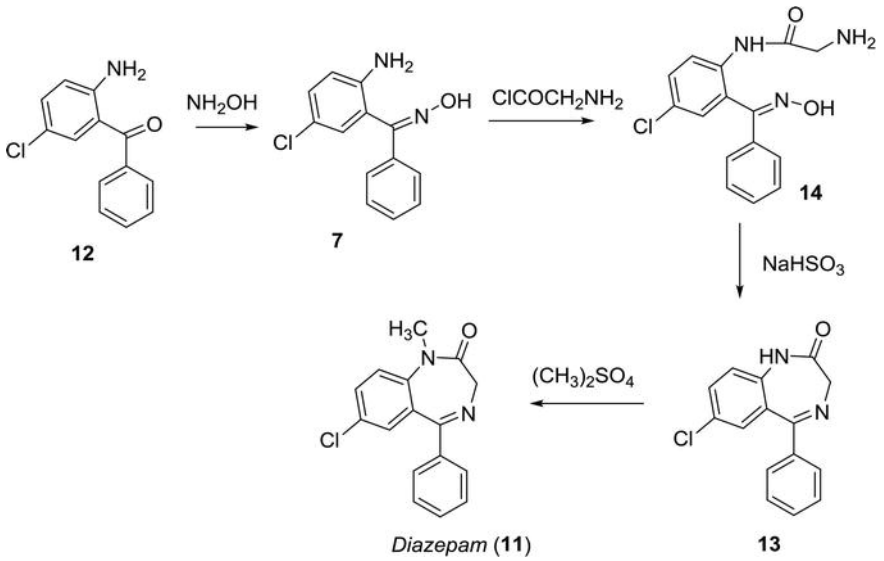
4-Chloro-*N*-methylaniline **Benzoyl chloride**

Method - 2

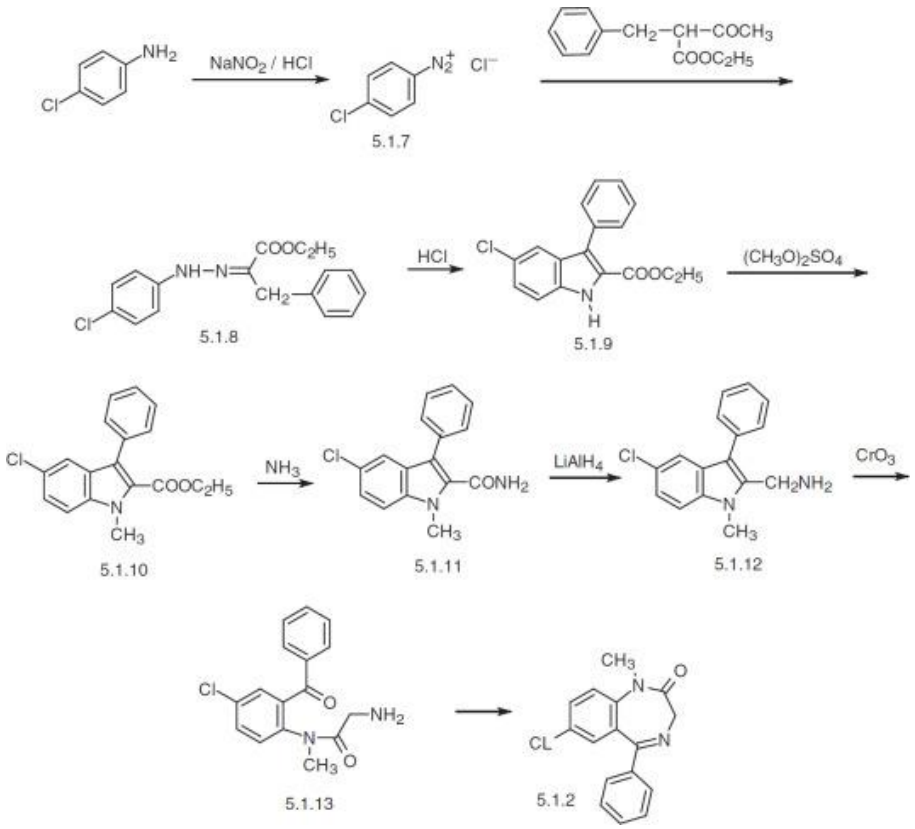
MC.1 Following is an outline for this synthesis of diazepam.



Method - 3



Method - 4



Diazepam has a number of uses including:

- Treatment of anxiety, panic attacks, and states of agitation
- Treatment of neurovegetative symptoms associated with vertigo
- Treatment of the symptoms of alcohol, opiate, and benzodiazepine withdrawal
- Short-term treatment of insomnia
- Treatment of muscle spasms
- Treatment of tetanus, together with other measures of intensive treatment
- Adjunctive treatment of spastic muscular paresis (paraplegia/tetraplegia) caused by cerebral or spinal cord conditions such as stroke, multiple sclerosis, or spinal cord injury (long-term treatment is coupled with other rehabilitative measures)
- Palliative treatment of stiff person syndrome
- Pre- or postoperative sedation, anxiolysis or amnesia (e.g., before endoscopic or surgical procedures)
- Treatment of complications with a hallucinogen crisis and stimulant overdoses and psychosis, such as LSD, cocaine, or methamphetamine
- Preventive treatment of oxygen toxicity during hyperbaric oxygen therapy

What is the mechanism of action of diazepam?

Diazepam is a benzodiazepine that exerts anxiolytic, sedative, musclerelaxant, anticonvulsant and amnestic **effects**. Most of these **effects** are thought to result from a facilitation of the **action** of gamma aminobutyric acid (GABA), an inhibitory neurotransmitter in the central nervous system.

What is the Chemical name of Diazepam

7-chloro-1-methyl-5-phenyl-3H-1,4-benzodiazepin-2-one.

What drug group is diazepam?

Diazepam is used to treat anxiety, alcohol withdrawal, and seizures. It is also used to relieve muscle spasms and to provide sedation before medical procedures. This medication works by calming the brain and nerves. Diazepam belongs to a class of drugs known as **benzodiazepines**.

Is diazepam an antidepressant?

Diazepam was a significantly better **antidepressant** than moclobemide at four week, although not at eight weeks. ... These data suggest the need to reconsider that benzodiazepines may be **antidepressants** and to study their possible **antidepressant** actions.