

Structure and Uses of Carbonyl Compounds

1. FORMALDEHYDE:

Formaldehyde is a simple organic compound with the formula CH_2O . It is of interest to doctors and scientists, as well as to many other industries, because of its unique chemical properties.

Uses:

1. Formaldehyde Uses in Medicine

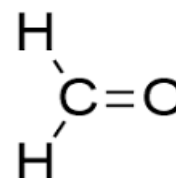
- Used as an antiseptic, as it kills most bacteria and fungi.
- Used in the treatment of warts and some parasites.
- Used in the production and sterilization of some vaccines.
- A formaldehyde precursor is sometimes used as an alternative to antibiotics in the treatment of urinary tract infections. The kidneys turn this precursor into formaldehyde, which is then excreted into the urinary tract instead of circulating in the blood.
- Used in some personal hygiene products to prevent bacterial growth

2. Formaldehyde Uses in Industry

- Used as a reactant to produce many artificial materials such as resins, plastics, and other industrial chemicals.
- Used to treat clothes to make fabrics crease-resistant.
- Used to produce materials used in numerous parts of car manufacture.
- Used in the production of plywood, carpeting, and building insulation.
- Used in the production of sanitary paper products such as napkins, paper towels, and tissues.
- Used to make chemicals used in paints and explosives.
- Used to prevent bacterial and fungal growth in animal feed for commercial farming.
- Used in the development of some types of photography film.

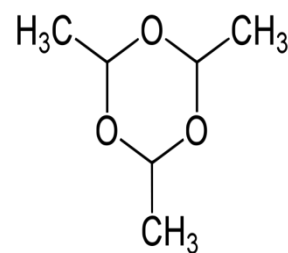
3. Formaldehyde Safety

Unfortunately, the same properties of formaldehyde that make it an excellent solvent, antiseptic, and preservative can also make it dangerous to human health. It is toxic to the



Formaldehyde

human body if ingested, and can cause irritation of the skin, lungs, and sinuses which can sometimes lead to long-term problems.



2. PARALDEHYDE:

Uses:

- It also has been used in the treatment of alcoholism and in the treatment of nervous and mental conditions to calm or relax patients who are nervous or tense and to produce sleep. However, paraldehyde has generally been replaced by safer and more effective medicines for the treatment of alcoholism and in the treatment of nervous and mental conditions
- It is a central nervous system depressant and was soon found to be an effective anticonvulsant, hypnotic and sedative. It was included in some cough medicines as an expectorant (though there is no known mechanism for this function beyond the placebo effect).
- Paraldehyde was the last injection given to Edith Alice Morrell in 1950 by the suspected serial killer John Bodkin Adams. He was tried for her murder but acquitted.
- It is used as hypnotic or a sedative. It was commonly used to induce sleep in sufferers from delirium tremens but has been replaced by other drugs in this regard. It is one of the safest hypnotics and was regularly given at bedtime in psychiatric hospitals and geriatric wards up to the 1970s. Up to 30% of the dose is excreted via the lungs (the rest via the liver). This contributes to a strong unpleasant odour on the breath.
- It is used as anti-seizure. It has been used in the treatment of convulsions.
- Today, paraldehyde is sometimes used to treat status epileptics. Unlike diazepam and other benzodiazepines, it does not suppress breathing at therapeutic doses and so is safer when no resuscitation facilities exist or when the patient's breathing is already compromised. This makes it a useful emergency medication for parents and other caretakers of children with epilepsy. Since the dose margin between the anticonvulsant and hypnotic effect is small, paraldehyde treatment usually results in sleep.
- Paraldehyde is an alternative to phenytoin and phenobarbital for the treatment of early Status epileptics. The primary advantages of paraldehyde are its wide spectrum of efficacy for different seizure types and relatively modest respiratory depressant effect.

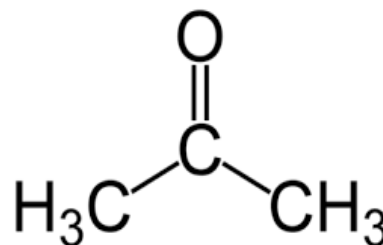
Disadvantages of paraldehyde include limited availability, its irritant effect on the rectal mucosa, and its unpleasant pungent odour

3. ACETONE:

Acetone is a highly flammable organic compound. This organic solvent has a chemical formula C_3H_6O . It is also known as **propanone**. It is found in the exhaust from vehicles, plants, trees and forest fires. It is also found in the human body usually present in urine and blood. It is colourless and volatile. It is miscible in water, ether, and ethanol and has a pungent, floral or irritating smell. It is widely used as an antiseptic and solvent.

Uses:

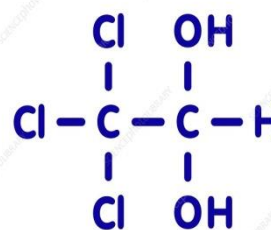
- It is used as a solvent for synthetic fibers and plastics
- It is used as a precursor for methyl methacrylate
- It is used to prepare metal before painting
- It is used in pharmaceutical industries in some drugs
- It is volatile and hence used in the laboratory to rinse lab glassware
- It is used as a drying agent
- It is used in the defatting process
- It is used in cosmetics such as nail polish remover
- It is used in the treatment of acne
- It is produced with the dry distillation of metal acetates. Currently, acetone is produced by propylene either by the direct or indirect method



4. CHLORAL HYDRATE:

Uses:

- Chloral hydrate is a sedative and hypnotic (meaning that it induces sleep) prescription drug that is used for the short-term treatment of insomnia.



- First developed in 1832, chloral hydrate is the oldest sleep medication still in use today. Other medical uses of the drug are to induce sleep before surgery and to treat post-surgical pain.
- Chloral hydrate has also been used for the treatment of alcohol withdrawal symptoms.
- Chloral hydrate is taken by mouth as liquid syrup or a soft capsule and may also be taken in the form of rectal suppositories. Its sedative effect generally begins in about 30 minutes, and it will induce sleep in most people in about 60 minutes. The use of chloral hydrate has declined in recent years, particularly due to the development of newer sedative and hypnotic drugs, such as benzodiazepines.
- **Chloral hydrate**, also called **chloral**, the first synthetically produced sedative-hypnotic drug, commonly used in the late 19th century to treat insomnia and still occasionally used to reduce anxiety or produce sleep before surgery.
- Chloral hydrate acts as a depressant on the central nervous system, with sedative effects similar to those of barbiturates.