

UNIT 8 • ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

Uses of Aldehydes and Ketones

The Big Four: Core Applications

Formaldehyde

The Preservative & Polymer Base

formalin (40% solution), bakelite (resin),
urea-formaldehyde glue

Acetaldehyde

The Chemical Starting Material

Acetic acid, ethyl acetate, vinyl acetate,
polymers, and drugs

Benzaldehyde

The Aromatic Agent

Perfumery and dye manufacturing

Acetone & EMK

The Universal Solvents

Industrial solvents (Acetone & Ethyl Methyl
Ketone)



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Formaldehyde: Two Vastly Different Products

Formalin

State: Liquid 40% aqueous solution

Application: Biological Preservation

Used to preserve biological specimens in laboratories and museums.

Bakelite

State: Solid Phenol-formaldehyde resin

Application: Plastics & Manufacturing

Used to prepare hard plastic materials and urea-formaldehyde glue.

Market Applications Summary



Preservation & Biology

Product: formalin (Source: Formaldehyde)



Adhesives & Plastics

Product: bakelite & urea-formaldehyde glue (Source: Formaldehyde)



Fragrances & Dyes

Product: Benzaldehyde (Also includes flavorings like vanillin, camphor, and butyraldehyde)



Industrial Solvents

Product: Acetone & Ethyl Methyl Ketone (EMK)

Watch for this: Formaldehyde Forms

The Trap:

Exam statements will often attempt to confuse the specific forms of formaldehyde, claiming that Bakelite is a 40% solution, or that Formalin is a polymer resin.

The Truth:

- formalin = **EXACTLY** a **40% aqueous** solution.
- bakelite = A **solid phenol-formaldehyde** cross-linked polymer.

Takeaway Tip:

Do not conflate the two physical states just because they share the exact same starting material.

Key Takeaways

- **Manufacturing Giants:** Aldehydes (formaldehyde, acetaldehyde) are foundational starting materials for creating polymers (bakelite), glues (urea-formaldehyde), and commercial chemicals (acetic acid).
- **Specialty Uses:** Ketones (like acetone and EMK) function primarily as industrial solvents, while aromatic aldehydes (benzaldehyde) dominate the perfumery and dye industries.



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