

Uses of Carboxylic Acids

A visual cheat sheet of industrial applications, polymer precursors, and high-yield exam pairings.

POLYMER PRECURSORS

→ Nylon-6,6 Production

- adipic acid is used as a monomer.



EXAM PAIRING: Condensation Polymerization

→ Polyester Production (PET)

- terephthalic acid is a key starting material.

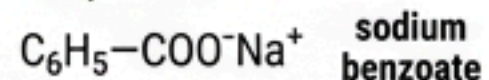


EXAM PAIRING: Reaction with ethylene glycol

INDUSTRIAL & CHEMICAL USES

→ Solvents & Preservatives

- acetic acid is used as a solvent and in "vinegar" production.
- benzoic acid and its salts (sodium benzoate) are used as food preservatives.

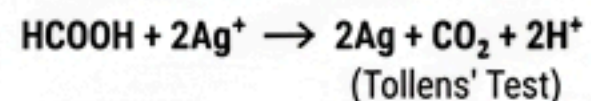


→ Chemical Intermediates

- formic acid is used in leather tanning and textile processing.



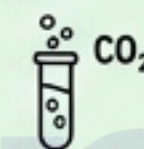
- formic acid as a reducing agent.



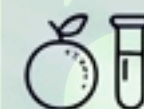
SUCCESS STATE: HIGH-YIELD IDENTIFICATION

→ Sodium Bicarbonate Test:

Evolution of CO_2 gas (effervescence) with NaHCO_3



→ Esterification: Fruity smell with alcohol and conc. H_2SO_4



Remember: Carboxylic acids are stronger acids than phenols (do not react with NaHCO_3).

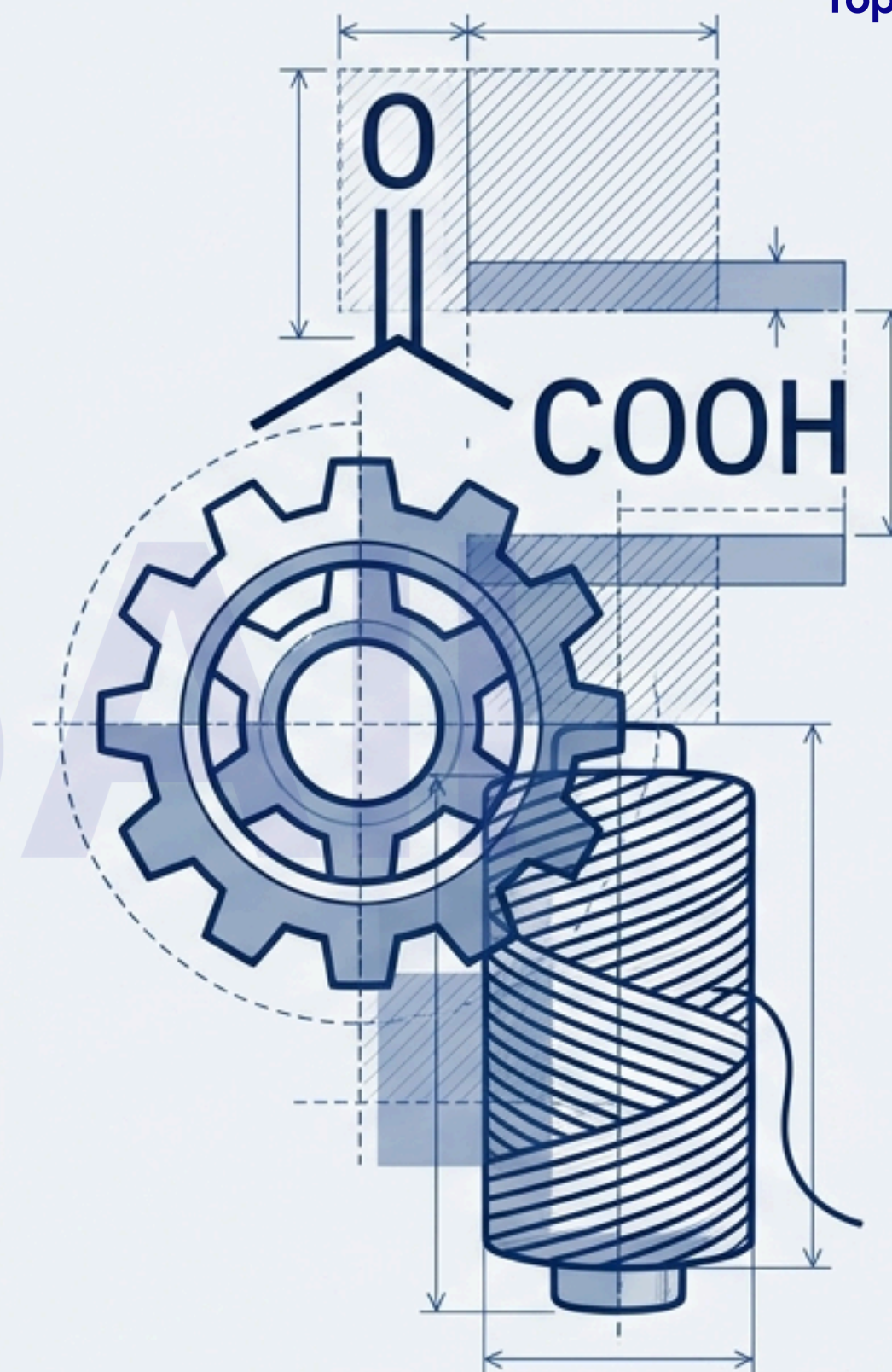
TRAP STATE: ACIDIC STRENGTH PITFALL

Electron-Withdrawing Groups (EWG) increase acidity by stabilizing the carboxylate ion.



Trichloroacetic acid (CCl_3COOH) is stronger than Acetic acid (CH_3COOH).

Avoid: Confusing effect of Electron-Donating Groups (EDG) which decrease acidity.



The Industrial Catalog

Methanoic acid → Rubber, textile, dyeing, leather, & electroplating

Ethanoic acid → Solvent & vinegar (food industry)

Hexanedioic acid → Nylon-6,6 manufacture

Benzoates → Esters of benzoic acid: **Perfumery**
→ Sodium benzoate: **Food preservative**

Higher fatty acids → Soaps and detergents



You've Learned the Theory. Let's Test Them Now.

$$E=mc^2$$



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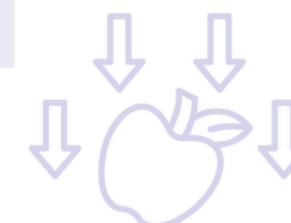
Practice Now



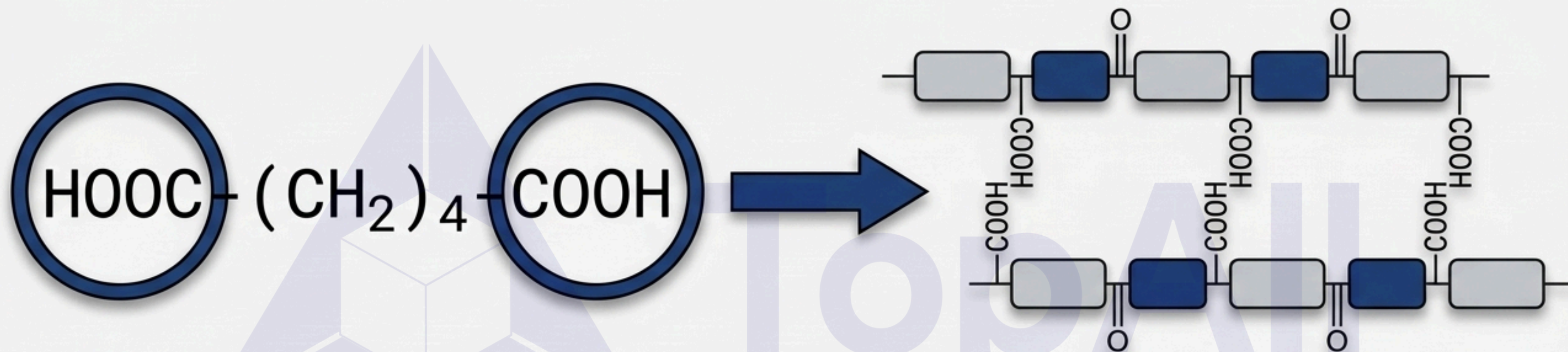
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Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
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- » Get Clear Explanations, Not Just Marks
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Polymer Spotlight: Hexanedioic Acid



Bifunctional Precursor: Because hexanedioic acid has a carboxyl group at *both* ends, it acts as a perfect building block to link into the long polymer chains of Nylon-6,6.

Quick Recall Matrix

Methanoic acid	Rubber / Leather / Electroplating
Ethanoic acid	Solvent / Vinegar
Hexanedioic acid	Nylon-6,6
Benzoic esters / Sodium benzoate	Perfumes / Preservatives
Higher fatty acids	Soaps / Detergents

Watch for this matching trap

Which carboxylic acid is correctly matched with its industrial use?

~~Methanoic acid → Nylon 6,6~~

Hexanedioic acid → Nylon-6,6



Do not confuse the industrial feedstocks. **Methanoic acid** is used for processing materials (rubber, leather, textiles), but it is **hexanedioic acid** that provides the carbon backbone necessary to synthesize **Nylon-6,6**.

Essential Syllabus Check

Key Takeaways Panel



Carboxylic acids are vital industrial inputs, driving everything from food preservation (**sodium benzoate**) and solvents (**ethanoic acid**) to heavy material processing (**methanoic acid**).



Hexanedioic acid is uniquely critical for polymer chemistry, specifically serving as the feedstock for **Nylon-6,6**—a high-frequency matching fact in competitive exams.



You've Learned the Theory.

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