

UNIT 7 • ALCOHOLS, PHENOLS AND ETHERS

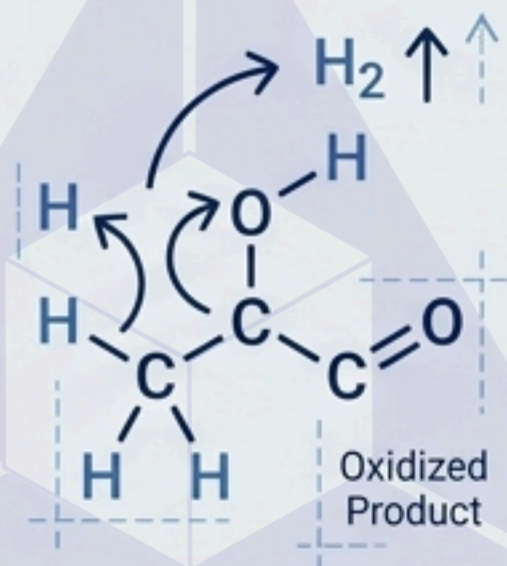
Oxidation of Alcohols

The Rule of Diminishing Returns



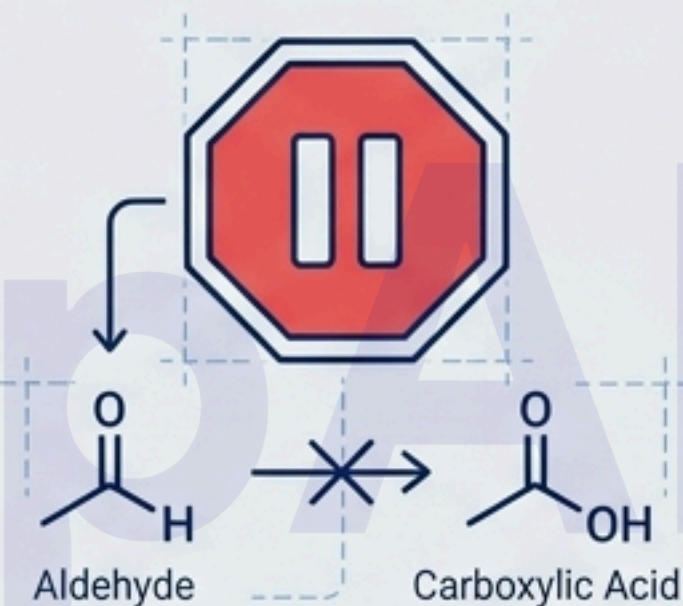
Essential Exam Vocabulary

Dehydrogenation

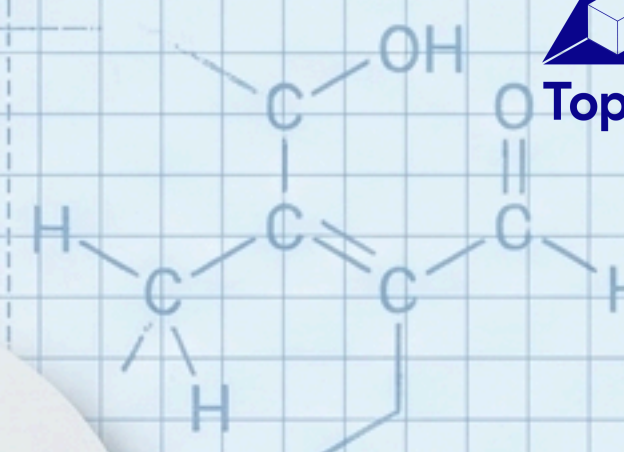


The core mechanism of alcohol oxidation. Involves the cleavage of an O-H and C-H bond to form a carbon-oxygen double bond (C=O).

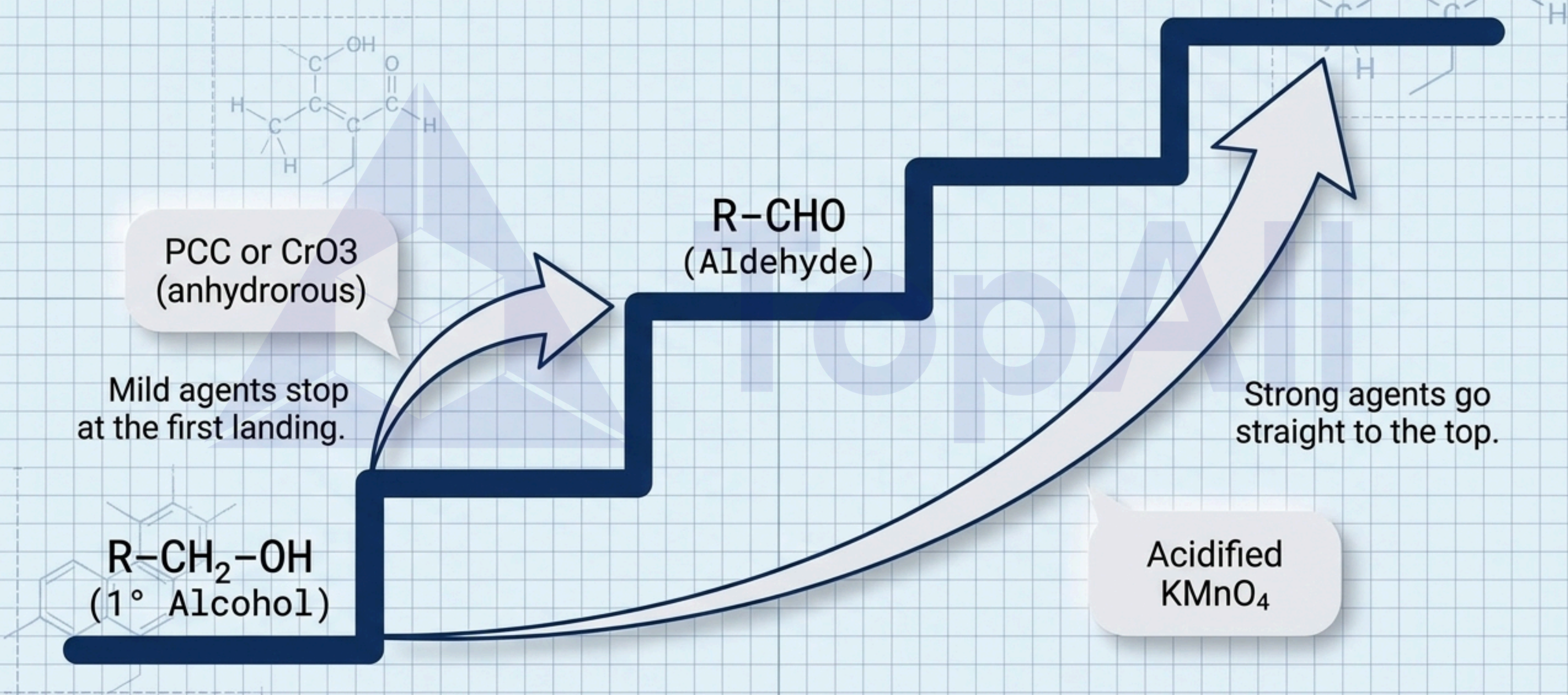
PCC



Pyridinium Chlorochromate. A complex of CrO₃ with pyridine and HCl. Acts as a mild stopping agent that halts oxidation exactly at the aldehyde stage.



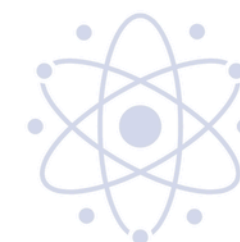
The 1° Alcohol Ladder





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

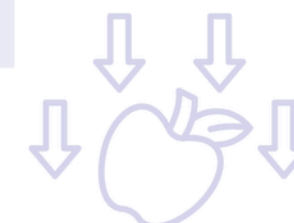
$$E=mc^2$$



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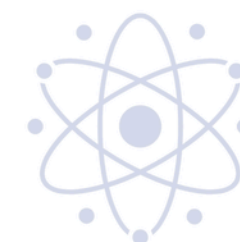
Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
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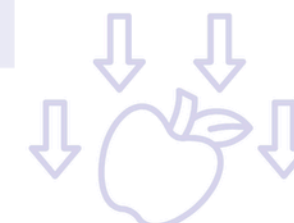
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Jump in while the concept is still fresh in your head

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MCQs

1.5L+
Students

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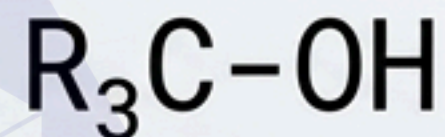
The 2° Alcohol Pathway



Secondary alcohols only take one step. They are oxidised to ketones. There is no normal second step to a carboxylic acid.

3° Alcohol Resistance

Normal Oxidation



Tertiary alcohols do not undergo oxidation reactions. The ladder is blocked.

Strong Conditions



Under elevated temperatures with strong oxidising agents like $KMnO_4$, the molecule undergoes C-C bond cleavage.

Forms a mixture of carboxylic acids containing fewer carbon atoms.

The Heated Copper Fork

Alcohol Vapours
+
Heated Cu at 573 K

1° & 2° Alcohols

Dehydrogenation

Forms Aldehydes
& Ketones

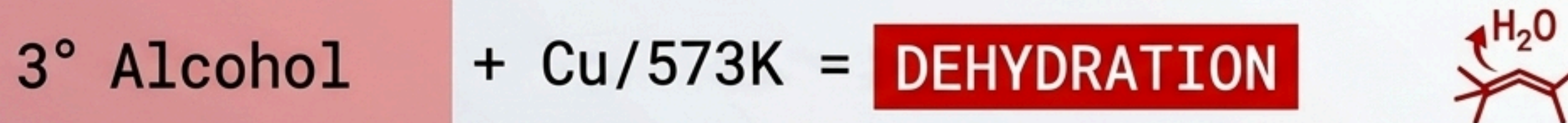
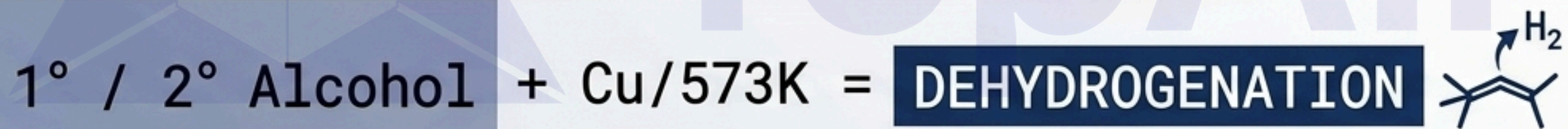
3° Alcohols

Dehydration

Forms Alkenes


Watch
for this

**Examiners will use Heated Cu at 573 K
to trick you. Do not assume one catalyst
means one reaction type!**



- Oxidation capacity diminishes with degree: 1° goes to acids (with strong agents) or aldehydes (with PCC/CrO₃), 2° stops at ketones, and 3° completely resists normal oxidation.
- When passing vapours over heated Cu (573 K), 1° and 2° alcohols undergo dehydrogenation, but 3° alcohols undergo dehydration to form alkenes.





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