

# Amines and Amides

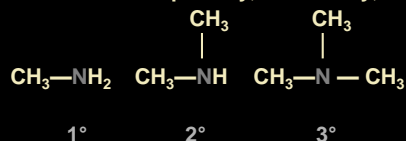
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## Amines

- Organic compounds of nitrogen N
- Classified as primary, secondary, tertiary



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## Naming Amines

IUPAC aminoalkane

$\text{CH}_3\text{CH}_2\text{NH}_2$   
aminoethane  
(ethylamine)

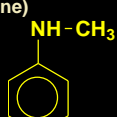
(Common alkylamine)

$\text{CH}_3\text{—NH—CH}_3$   
*N*-methylaminomethane  
(dimethylamine)

$\text{NH}_2$   
|  
 $\text{CH}_3\text{CHCH}_3$   
2-aminopropane  
(isopropylamine)



Aniline

*N*-methylaniline

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## Learning Check

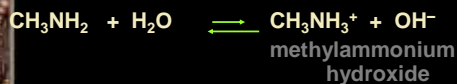
Give the IUPAC name and classify:

- A.  $\text{CH}_3\text{NHCH}_2\text{CH}_3$   
 $\text{CH}_3$   
 |  
 B.  $\text{CH}_3\text{CH}_2\text{NCH}_3$

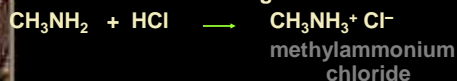
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## Reactions of Amines

- Act as weak bases in water



- Neutralization with acid gives ammonium salt



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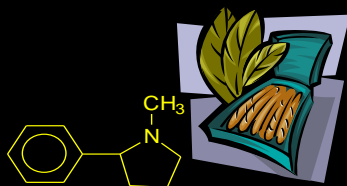
## Alkaloids

- Physiologically active nitrogen-containing compounds
- Obtained from plants
- Used as anesthetics, antidepressants, and stimulants
- Many are addictive



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## Nicotine



Nicotine, leaves of tobacco plant

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## Caffeine

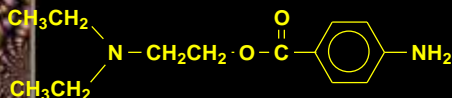


Caffeine, coffee beans and tea



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## Procaine



Procaine (novocaine), painkiller



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## Learning Check

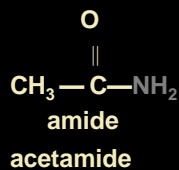
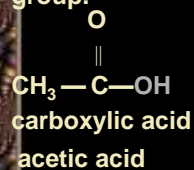
Write a structural formula for

- 1-aminopentane
- 1,3-diaminocyclohexane

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## Amides

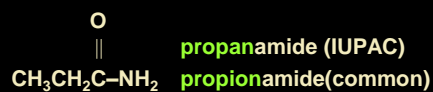
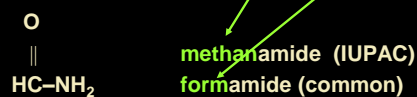
Derivatives of carboxylic acids where an amino (-NH<sub>2</sub>) group replaces the -OH group.



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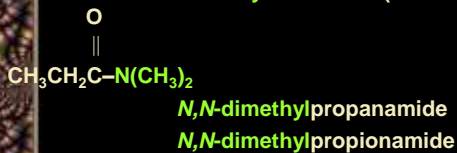
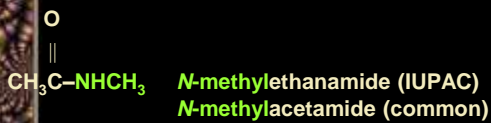
## Naming Amides

Alkanamide



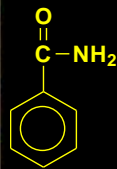
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## Naming Amides with N-Groups

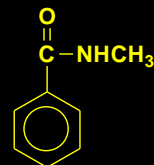


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## Aromatic Amides



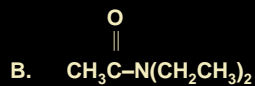
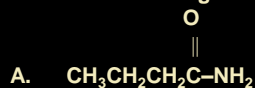
Benzamide

*N*-methylbenzamide

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## Learning Check

Name the following amides:



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## Learning Check

Draw the structures of

A. Pentanamide

B. *N*-methylbutanamide



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## Reactions of Amides

Amides undergo

acid hydrolysis

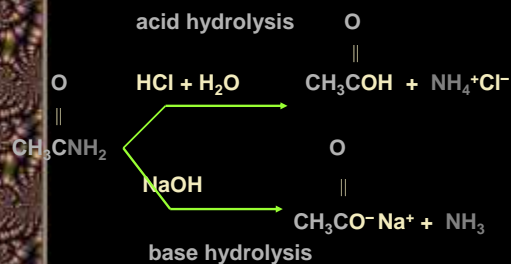
base hydrolysis

carboxylic acid  
ammonium salt

salt of carboxylic acid  
and an amine  
or ammonia

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## Reactions of Amides



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## Learning Check

Write the products of the hydrolysis of *N*-ethylpropanamide with NaOH.



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