

Introduction to Physical Science

Amines & Amides
Presented by Robert Wagner

Amines

- Amines - molecules with carbon-nitrogen bonds
 - Nitrogen retains a pair of electrons and three bonds to either carbon or hydrogen atoms
 - Naming involves -ine suffix
- Pyridine
 - Nitrogen atom replaces one of the carbon atoms in an aromatic hydrocarbon

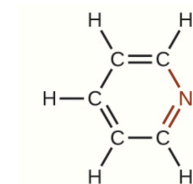
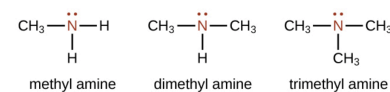


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Amides

- Amides - contain nitrogen atoms which are bonded to the carbon atom of a carbonyl group
 - Naming includes suffix -amide

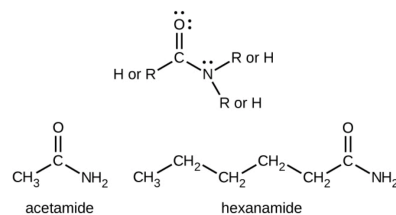


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Carboxylic Acids and Amides

- Amides can be produced when a carboxylic acid reacts with an amine

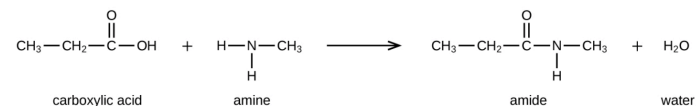


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Review of Organic Molecules

Compound Name	Structure of Compound and Functional Group (red)	Example	
		Formula	Name
alkene	$C=C$	C_2H_4	ethene
alkyne	$C\equiv C$	C_2H_2	ethyne
alcohol	$R-OH$	CH_3CH_2OH	ethanol
ether	$R-O-R'$	$(C_2H_5)_2O$	diethyl ether
aldehyde	$R-C(=O)H$	CH_3CHO	ethanal
ketone	$R-C(=O)R'$	$CH_3COCH_2CH_3$	methyl ethyl ketone
carboxylic acid	$R-C(=O)OH$	CH_3COOH	acetic acid
ester	$R-C(=O)OR'$	$CH_3CO_2CH_2CH_3$	ethyl acetate
amine	$R-NH_2$ or $R-NH-R'$ or $R-NR'_2$	$C_2H_5NH_2$	ethylamine
amide	$R-C(=O)NH_2$	CH_3CONH_2	acetamide

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Summary

- Amines are molecules with carbon-nitrogen bonds
- In amides, the nitrogen is bonded to the carbon in a carbonyl group
- Amides can be produced when an amine reacts with a carboxylic acid