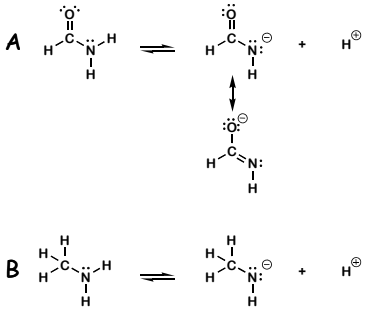
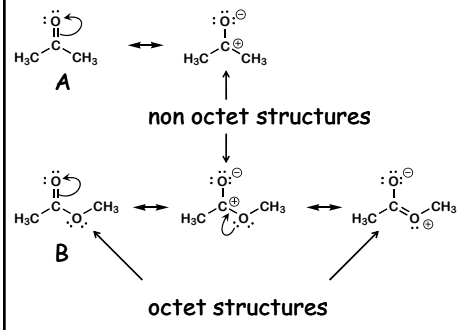
Predict the more acidic compound.

Draw both products and their resonance structures.



1

Which of the following C=O compounds is more stabilized by resonance?



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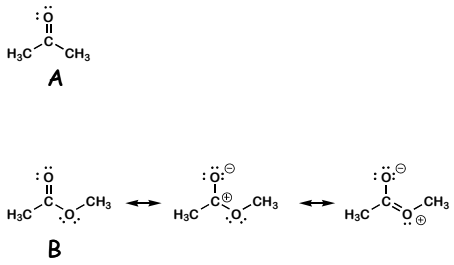
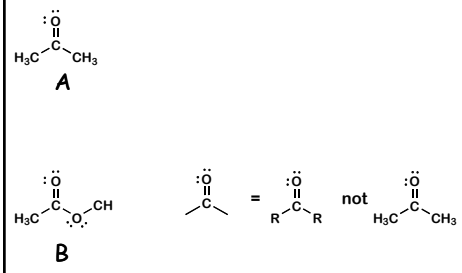


Which of the following C=O compounds would be predicted to react faster with methyl lithium?



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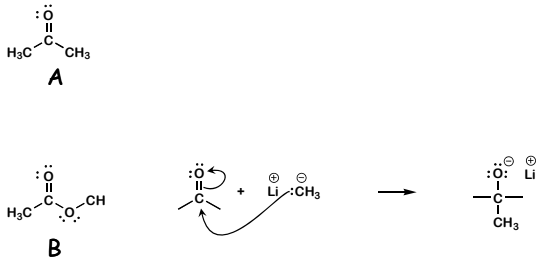

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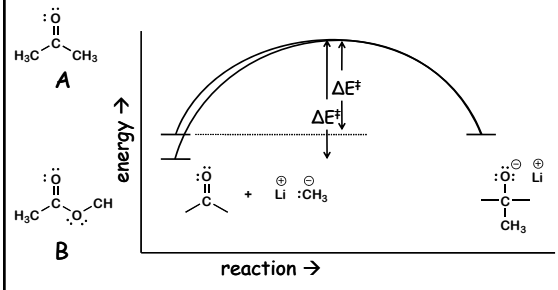

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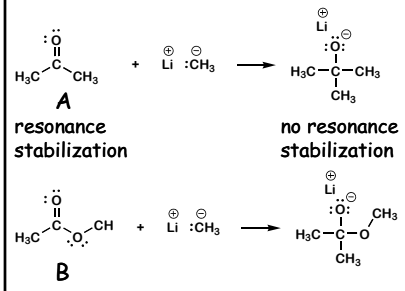


A

resonance stabilization

no resonance stabilization

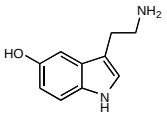
B

Organic Chemistry, Ch 2

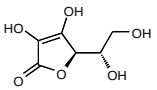
What is Organic Chemistry?

what we eat

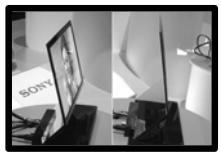
who we are



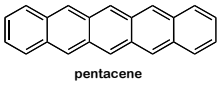
serotonin



ascorbic acid

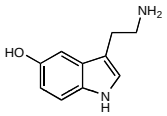


what we use



pentacene

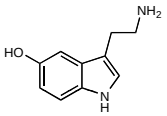
Organic Chemistry, how can it be organized?



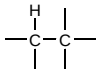
Organic Chemistry, how can it be organized?

amines —NH_2

alcohols —OH



alkanes



aromatics

10

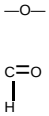
Organic Chemistry, how can it be organized?

amines —NH_2

alcohols —OH

ethers —O—

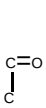
aldehydes



carboxylic acids

hydrocarbons

ketones



alkanes

alkenes

aromatics

amides

many others!!

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TABLE 2.3 Important Families of Organic Compounds

	Family						
	Alkane	Alkene	Alkyne	Aromatic	Haloalkane	Alcohol	Ether
Functional group	C—H and C—C bonds		—C≡C—	Aromatic ring			
General formula	RH	RCH—CH$_2$ RCH—CHR R$_2$C—CHR R$_2$C—CR$_2$	RC≡CH RC≡CR	ArH	RX	ROH	ROR
Specific example	CH_3CH_3	$CH_2{=}CH_2$	HC≡CH		CH_3CH_2Cl	CH_3CH_2OH	CH_3OCH_3
IUPAC name	Ethane	Ethene	Ethyne	Benzene	Chloroethane	Ethanol	Methoxymethane
Common name[a]	Ethane	Ethylene	Acetylene	Benzene	Ethyl chloride	Ethyl alcohol	Dimethyl ether

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TABLE 2.3 Important Families of Organic Compounds (cont.)

	Family					
	Amine	Aldehyde	Ketone	Carboxylic Acid	Ester	Amide	Nitrile
Functional group							—C≡N:
General formula	RNH_2 R_2NH R_3N						RCN
Specific example	CH_3NH_2						$CH_3C{\equiv}N$
IUPAC name	Methanamine	Ethanal	Propanone	Ethanoic acid	Methyl ethanoate	Ethanamide	Ethanenitrile
Common name	Methylamine	Acetaldehyde	Acetone	Acetic acid	Methyl acetate	Acetamide	Acetonitrile

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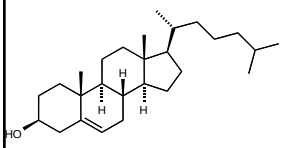
Why organize organic chemistry around Functional Groups?

amines —NH_2

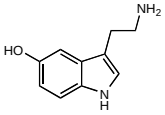
alcohols —OH

hydrocarbons

- alkanes 
- alkenes 
- aromatics 



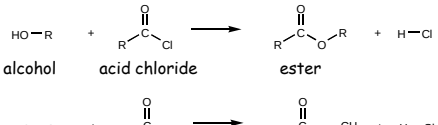
cholesterol



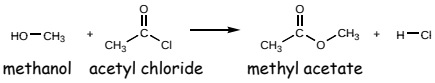
serotonin

14

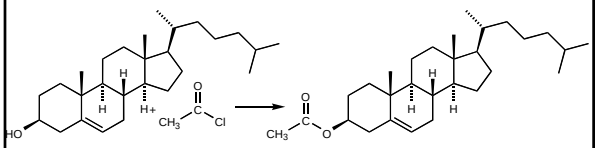
Why organize organic chemistry around Functional Groups?



alcohol acid chloride ester

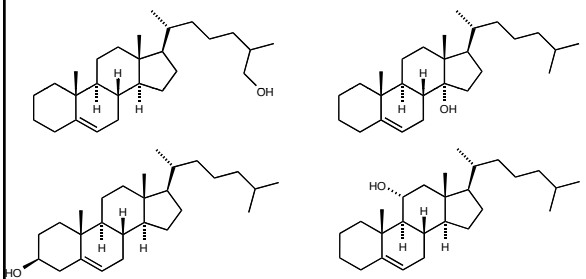


methanol acetyl chloride methyl acetate



cholesterol acetyl chloride cholesteryl acetate

The HO- functional group in different molecules will actually have slightly different reactivities.

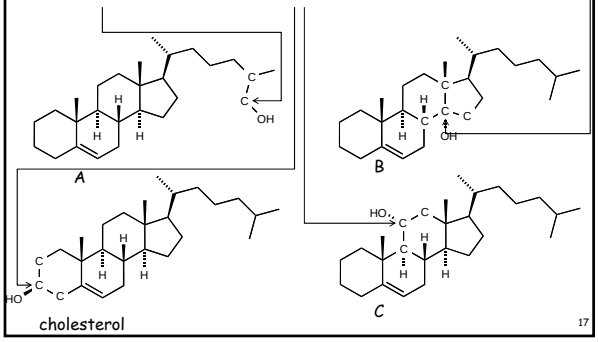


cholesterol

16

With respect to the environment of the HO group which of the following alcohols, A, B or C, is most like cholesterol?

1° carbon atom 2° carbon atom 3° carbon atom



A B C

cholesterol

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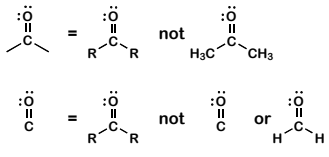
Functional Groups and Organic Synthesis

alkane

C–C



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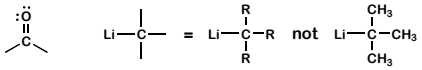
Functional Groups and Organic Synthesis

alkane

C–C

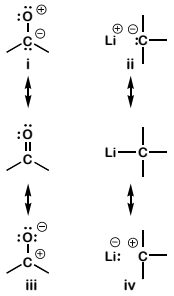


19

Choose the next best resonance structure for each of the compounds shown below.

alkane

C–C



A. i + iv

B. i + iii

C. ii + iv

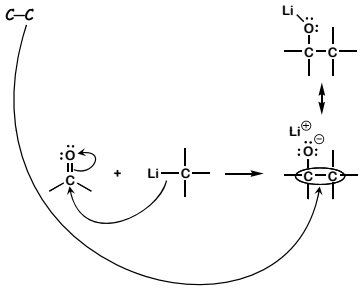
D. ii + iii

20

Predict the product of the following reaction.

alkane

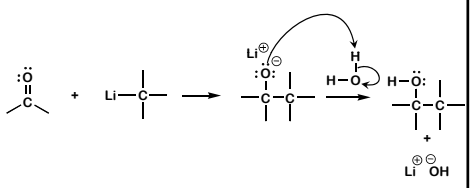
C–C



Predict the product of the following reaction.

alkane

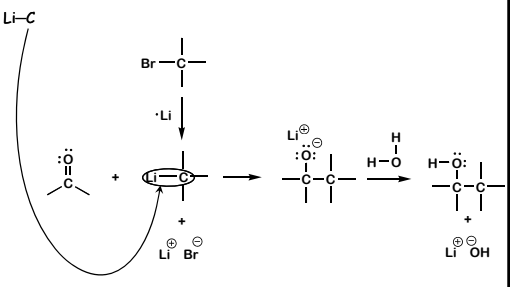
C–C



How are organo metallic compounds prepared?

organolithium

Li–C

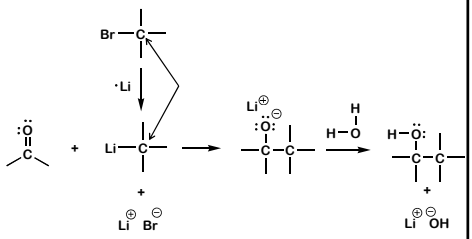


How are organo metallic compounds prepared?

organolithium

Li–C

reduction = gain of electrons.
oxidation = loss of electrons

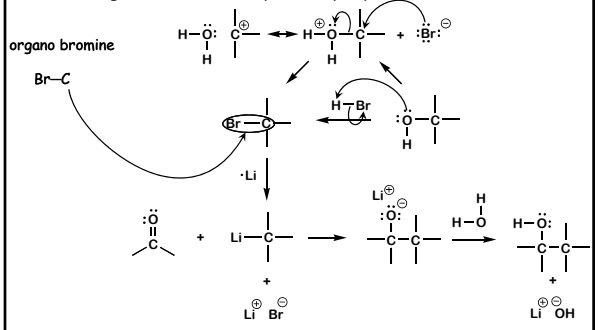


In the above reaction is the carbon atom: (A) oxidized or (B) reduced?

How are organo halides compounds prepared?

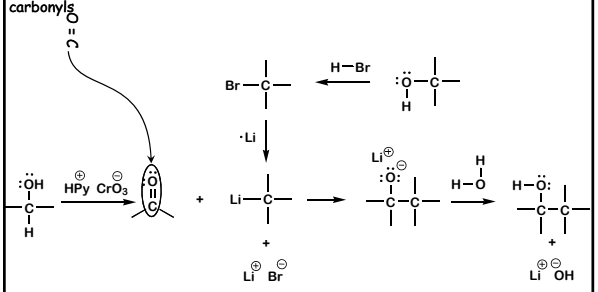
organo bromine

Br—C



How are carbonyl compounds prepared?

carbonyls

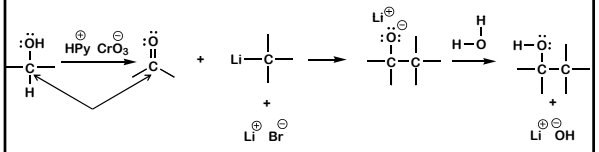


How are carbonyl compounds prepared?

carbonyls

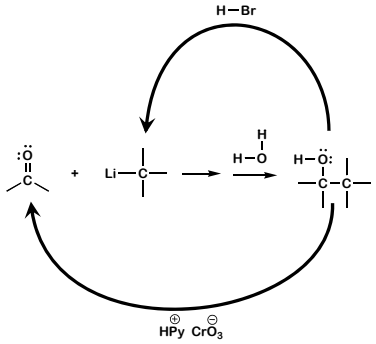
O = C

reduction = gain of electrons.
oxidation = loss of electrons



In the above reaction is the carbon atom: (A) oxidized or (B) reduced?

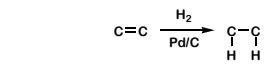
Carbon-carbon bond forming reactions are very important for converting simple organic compounds into complex organic compounds!



Functional Groups and Organic Synthesis. Other reactions.

hydrocarbon

C–C



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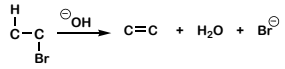
Functional Groups and Organic Synthesis. Other reactions.

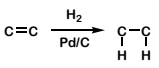
alkenes

C=C



hydrocarbon

C–C



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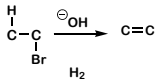
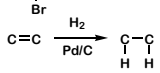
Functional Groups and Organic Synthesis

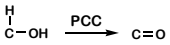
alkenes



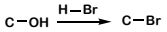
hydrocarbon



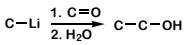
carbonyls



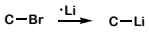
haloalkane



alkane



organolithium



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text