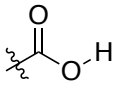
Molecular Fragments And Functional Groups

A. Introduction

Being unable to name compounds accurately is often that restrictive, but correctly interpreting molecular drawings, *eg* as an ester with the intended substituents, is usually vital. The problem is that there are a few ways to draw each functional group, and several widely used abbreviations for fragments that simply must be learned; chemists frequently draw the same molecule in different ways, and different chemists tend to favor different abbreviations. This sucks for you.

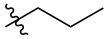
B. Fragments

a *molecular fragment* *cannot* be isolated.

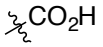


carboxyl

name of fragment

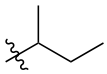


n-propyl

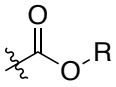


carboxyl

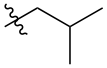
carboxylic acid



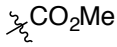
s-butyl



carboxyalkyl

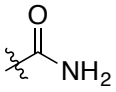


i-butyl



carboxymethyl

i-propyl



carboxamide

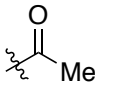
amide

t-butyl

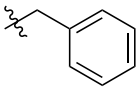
carboxamide

amide

ethyl

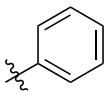


acyl



benzyl

acyl

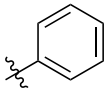


phenyl

acyl

vinyl

acyl

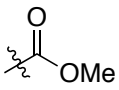


phenyl

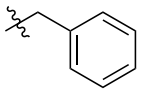
acyl

carbonyl chloride

acid chloride



carboxyalkyl



benzyl

$-CO_2Et$

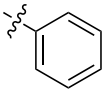
carboxyethyl

Ac

acyl

Bn

benzyl



phenyl

cyano or nitrile

$CH_2C_6H_6$

benzyl

Ph

phenyl

-COMe

acyl

$-C_6H_5$

phenyl

-OMe

methoxy

cyano or nitrile

i-propyl

ethyl

t-butyl

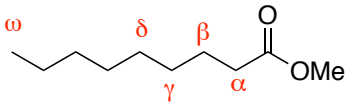
acetyl

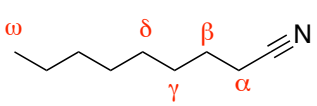
phenoxy

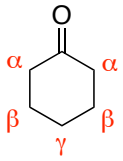
benzylamine

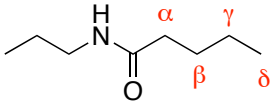
acyl

means *last*.



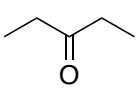




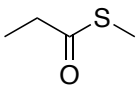


ω is last, δ is more specfic

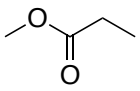
C. Expanded Forms Of Functional Groups



ketone

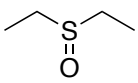


thioester

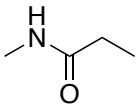


ester

aldehyde

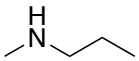


sulfoxide

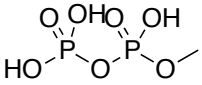


amide

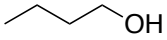
ester



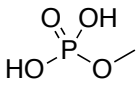
amine



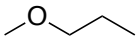
diphosphate



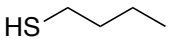
alcohol



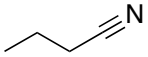
monophosphate



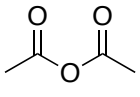
ether



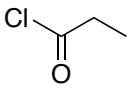
thiol



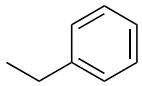
nitrile



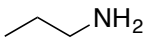
carbylic acid anhydride



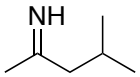
acid chloride



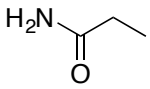
arene or phenyl



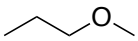
amine



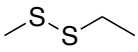
imine



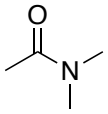
amide



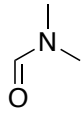
ether



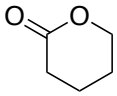
disulfide



amide

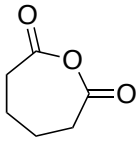


amide



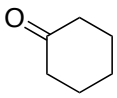
lactam

alkene



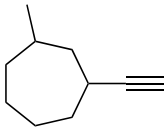
carboxylic acid anhydride

amide

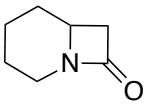


ketone

disulfide



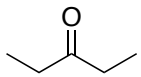
alkyne



amide or lactam

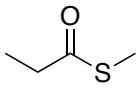
D. Abbreviated Forms Of Functional Groups

EtCOEt



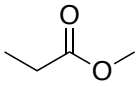
name of functional group
ketone

EtCO(SMe)



name of functional group
thioester

$EtCO_2Me$

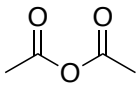


name of functional group
ester

EtCOH

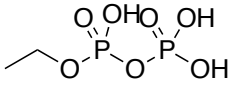
name of functional group
aldehyde

$MeCO_2COMe$



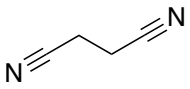
name of functional group
carboxylic acid anhydride

$EtOP(O)(OH)OP(O)(OH)_2$



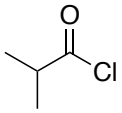
name of functional group
diphosphate

$NCCH_2CH_2CN$



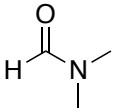
name of functional group
nitrile

$(CH_3)_2CHCOCl$



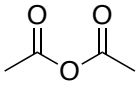
name of functional group
acid chloride

$HCONMe_2$



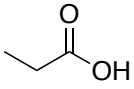
name of functional group
amide

MeCOOCOMe



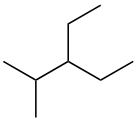
name of functional group
carboxylic acid anhydride

$CH_3CH_2CO_2H$



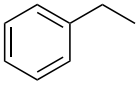
name of functional group
carboxylic acid

$(CH_3)_2CHCH(CH_2CH_3)_2$



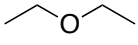
name of functional group
alkane

$C_6H_5CH_2CH_3$



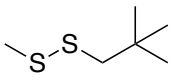
name of functional group
arene

$CH_3CH_2OCH_2CH_3$



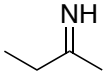
name of functional group
ether

$CH_3S_2CH_2C(CH_3)_3$



name of functional group
disulfide

$CH_3CH_2CNHCH_3$

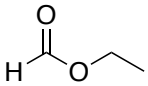


name of functional group
imine

Me_2SO

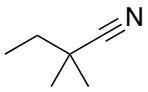
name of functional group
_____sulfoxide_____

HCO_2Et



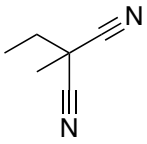
name of functional group
_____ester_____

$CH_3CH_2C(CH_3)_2CN$



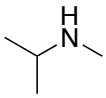
name of functional group
_____nitrile_____

$CH_3CH_2C(CN)_2CH_3$



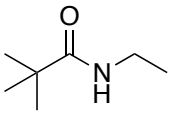
name of functional group
_____nitrile____

$^{i}PrNHMe$



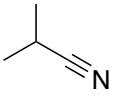
name of functional group
_____amine_____

$^{t}BuCONHEt$



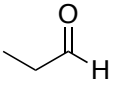
name of functional group
____amide____

$(CH_3)_2CN$

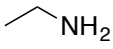


name of functional group
_____nitrile_____

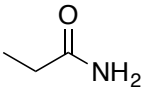
CH_3CH_2COH



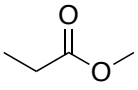
name of functional group
_____aldehyde_____



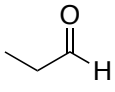
name of functional group
_____amine_____



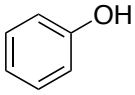
name of functional group
_____amide____



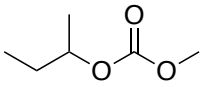
name of functional group
_____ester_____



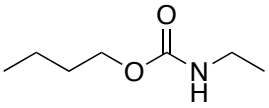
name of functional group
____aldehyde___



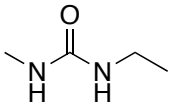
name of functional group
____phenol_____



name of functional group
_____carbonate_____

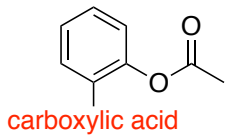


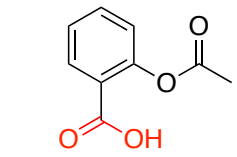
name of functional group
_____carbamate_____



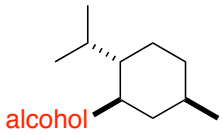
name of functional group
_____urea_____

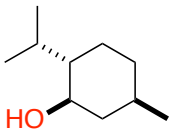
Find this question hard? Remember: go to the web and to figure out the answers for the maximum benefit (do not look at a key!).



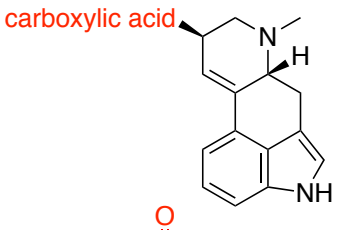


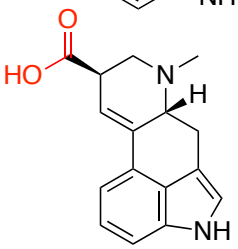
aspirin



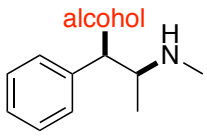


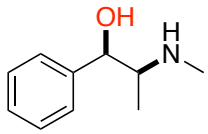
menthol



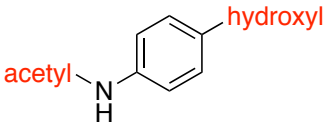


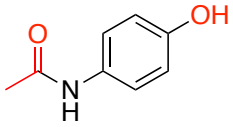
lysergic acid (LSD)



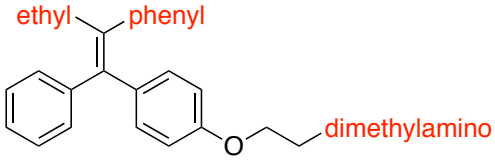


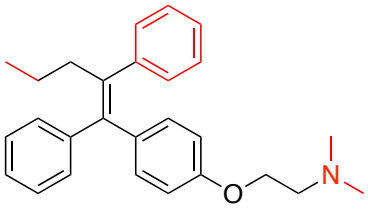
ephedrine



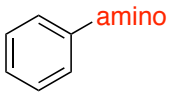


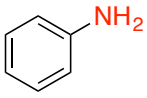
acetaminophen (tylenol)



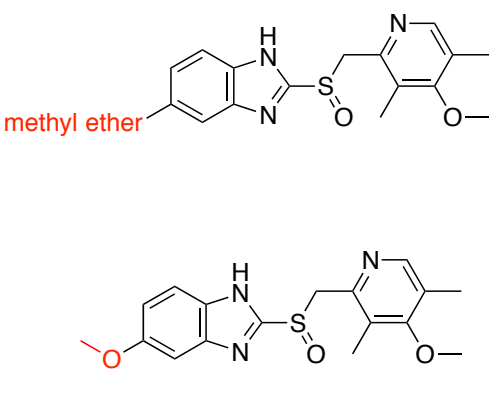


tamoxifen

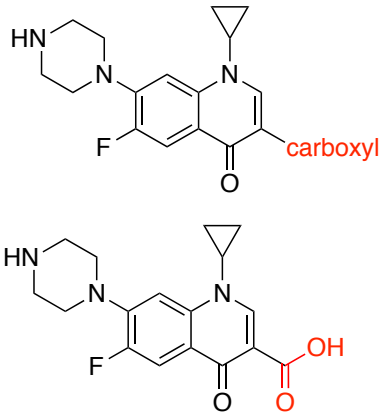




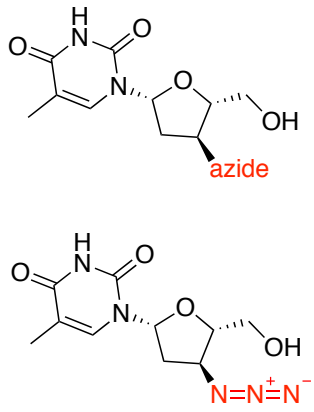
aniline



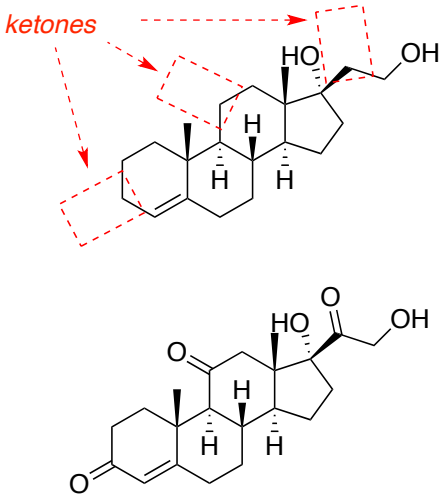
omeprazol



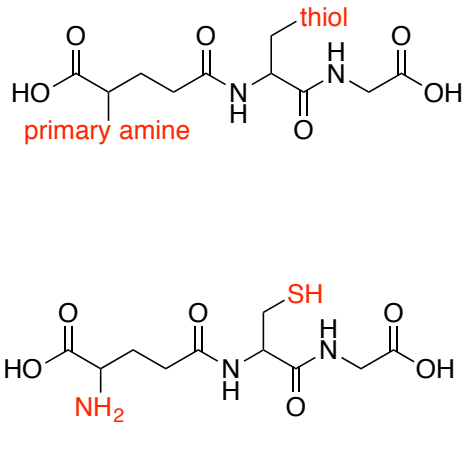
ciprofloxacin "cipro"



azidothymidine

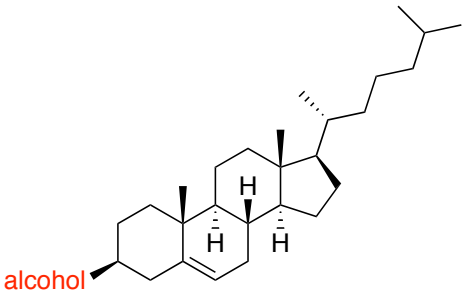


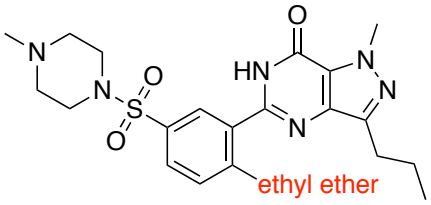
cortisone

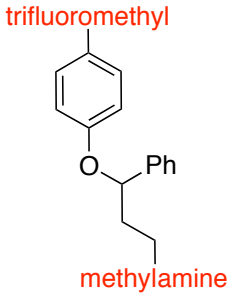


glutathione

phenol



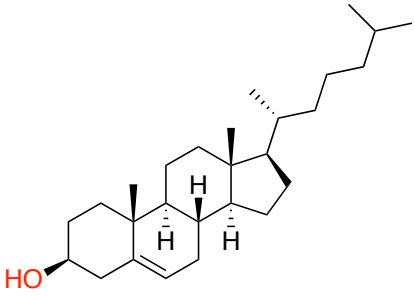


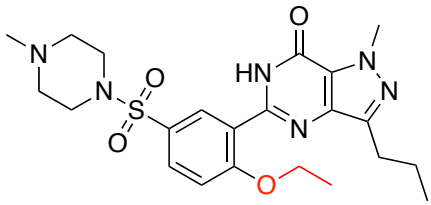


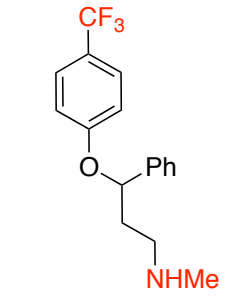
cholesterol

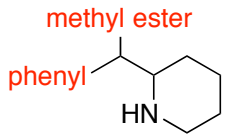
viagra

prozac

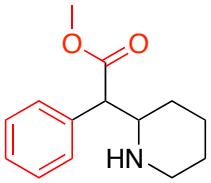








My chemistry instructor might like me to take methylphenidate (other name: retalin) to improve my *attention*.



methylphenidate