

3.15: ADDITIONAL EXERCISES

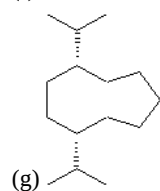
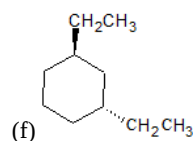
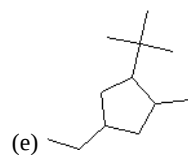
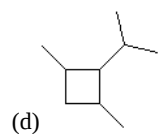
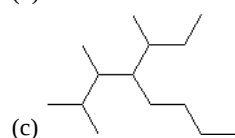
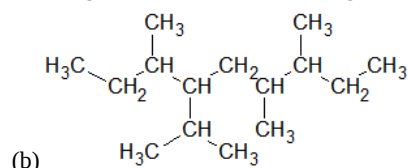
ALKANE NOMENCLATURE

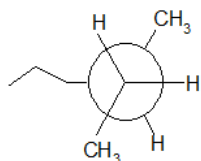
3-1 Draw the structure for each of the following compounds

- sec-butylcyclohexane
- 2,2,7-trimethyloctane
- 3-ethyl-2,4,5-trimethylhexane
- 1-cyclopropylbutane
- 3-ethyl-2,5-dimethyl-4-propylheptane
- 1-tert-butyl-4-iodocyclohexane
- trans-1,4-diisopropylcyclohexane
- 3-bromo-1-cyclopropyl-2-methylbutane
- Z-1,2-dichloro-1-methylcyclopentane
- 1-chloro-3-ethyl-3-methylhexane
- Norbornane (Bicyclo[2.2.1]heptane)
- 1-[2-(bromomethyl)cyclopropyl]-4-tert-butylcyclohexane

3-2 Give the IUPAC names of the following alkanes.

- (a) $(\text{CH}_3)_2\text{CHCH}_2\text{CH}_2\text{CH}(\text{CH}_2\text{CH}_3)\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_3$





(h)

3-3 The following names are incorrect or incomplete, but they represent the real structures. Draw each structures and name it correctly.

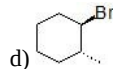
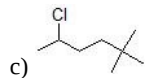
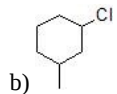
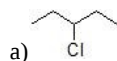
- (a) 2-ethyl-3-methylhexane
- (b) 2-isopropylpentane
- (c) 2-bromo-5-isopropylheptane
- (d) 4-ethyl-3-isopropylheptane
- (e) 2,4-trimethylpentane
- (f) 1-chloro-2-ethyl-5-methylcyclohexane

ALKYL HALIDE NOMENCLATURE

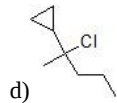
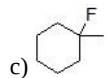
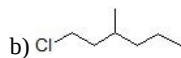
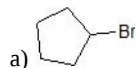
3-4 Draw the structures of these following compounds

- a) 2-chlorohexane
- b) 1-bromo-2-chlorocyclopentane
- c) Isobutyl chloride
- d) 5-chloro-2,3-dimethylhexane
- e) (2S) 2-bromohexane

3-5 Give IUPAC names to the following compounds

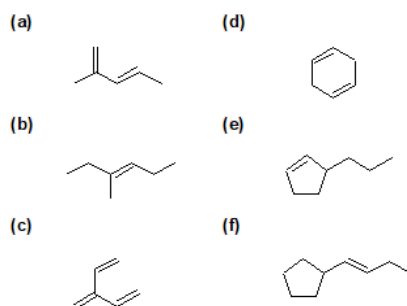


3-6 Classify each of the following compounds as primary, secondary, or tertiary alkyl halides



ALKENE NOMENCLATURE

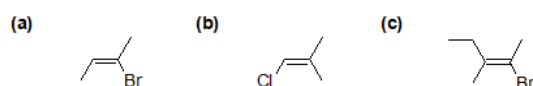
3-7 Give the IUPAC name for the following alkene structures.



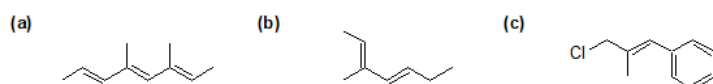
3-8 Give the structures of the following compounds.

- [1,1'-bi(cyclohexan)]-1-ene
- 2,3-dimethylbut-2-ene
- (4E)-4-ethylidene-2-methylhept-1-ene
- [(1E,3E)-hexa-1,3-dien-1-yl]cyclopentane

3-9 State whether the following compounds are *Z*, *E*, or neither.



3-10 Give the IUPAC name for the following structures.

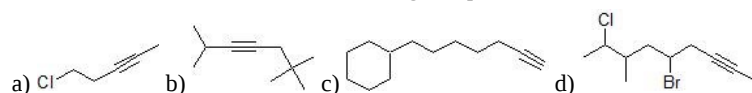


ALKYNE NOMENCLATURE

3-11 Draw the bond-line for these following compounds:

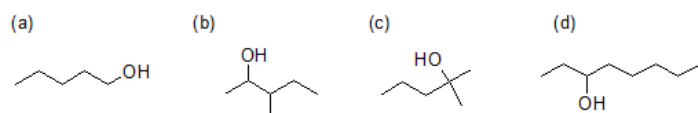
- 3-hexyne
- 2-bromo-5-octyne
- 3,3-dimethyl-6-decyne
- Cyclopentylacetylene
- 2-chloronon-4-en-6-yne
- 2,4-heptadiyne

3-12 Give IUPAC names for the following compounds

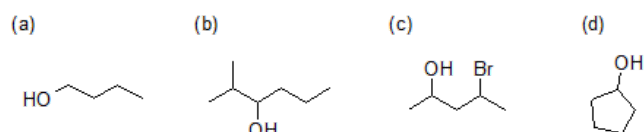


ALCOHOL AND PHENOL NOMENCLATURE

3-13 Classify each alcohol as primary, secondary, or tertiary.



3-14 Give a systematic (IUPAC) name for each alcohol.

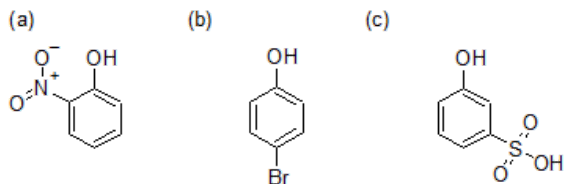


3-15 Draw the structures of the following compounds.

- 2-methylhexan-1-ol

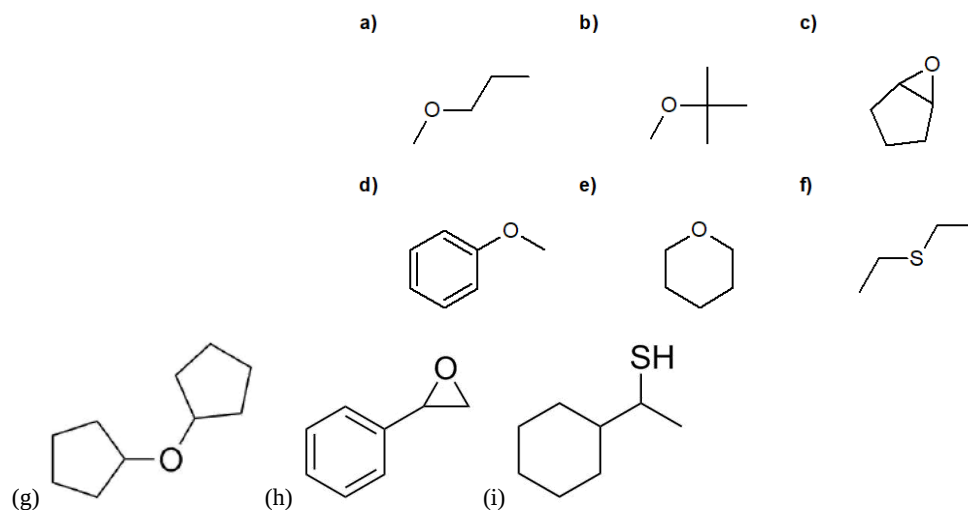
- b) 2-methylpentan-2-ol
- c) 2-chlorophenol
- d) 4-(chloromethyl)hexan-1-ol
- e) cyclopent-2-en-1-ol
- f) 3-bromo-2-(2-bromoethyl)pentan-1-ol

3-16 Give a systematic (IUPAC) name for each phenol.



ETHERS

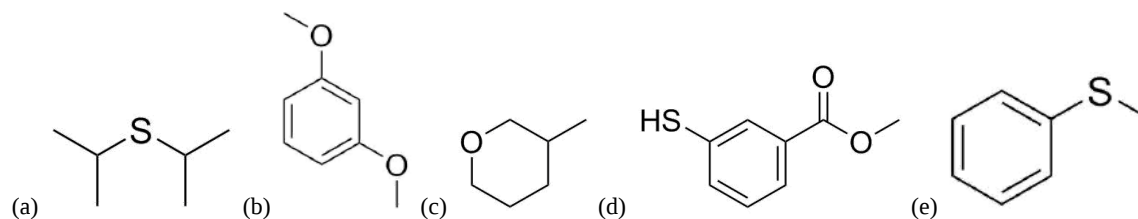
3-17 Give the IUPAC name for the following chemical structures.



3-18 Draw structures of the following.

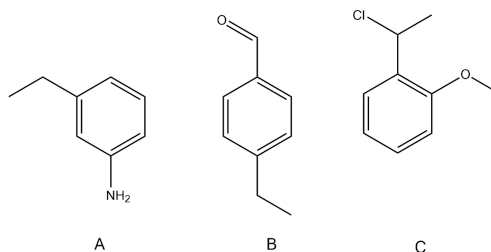
- (a) 3-isopropoxy-pentane (b) 1-(4-chlorophenoxy)-3-methylbenzene (c) 2-(tert-butoxy)-2-methylpropane

3-19 Name the following ethers and sulfides.

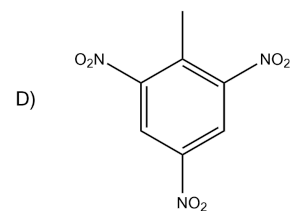
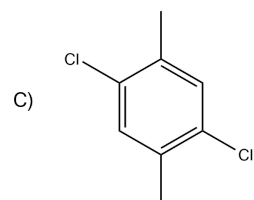
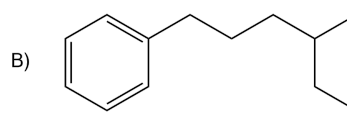
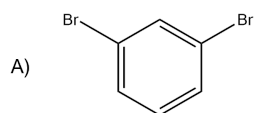


BENZENE AND ITS DERIVATIVES

3-20 State whether the following is para, meta, or ortho substituted.



3-21 Name the following compounds.

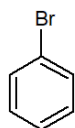


3-22 Draw the following structures

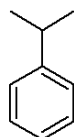
- p-chloriodobenzene
- m-bromotoluene
- p-chloroaniline
- 1,3,5-trimethylbenzene

3-23 Give the IUPAC name for the following benzene derivatives.

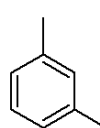
a)



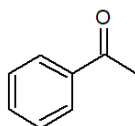
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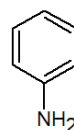
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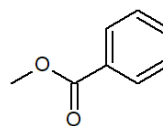
d)



e)



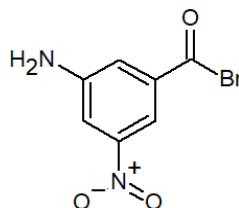
f)



3-24 Draw the following molecules given by their IUPAC nomenclature.

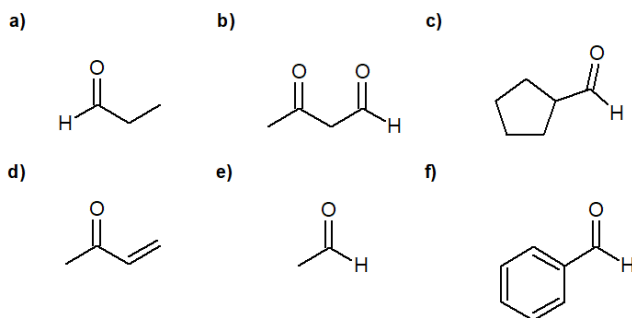
- 5-formyl-2-hydroxybenzoic acid
- 1,2-diethyl-3-fluorobenzene
- 4-amino-3-ethyl-5-methylphenol

3-25 Rank the functional groups on the following molecule in order of priority (highest to lowest).



ALDEHYDES AND KETONES

3-26 For the following molecules, give the IUPAC nomenclature.



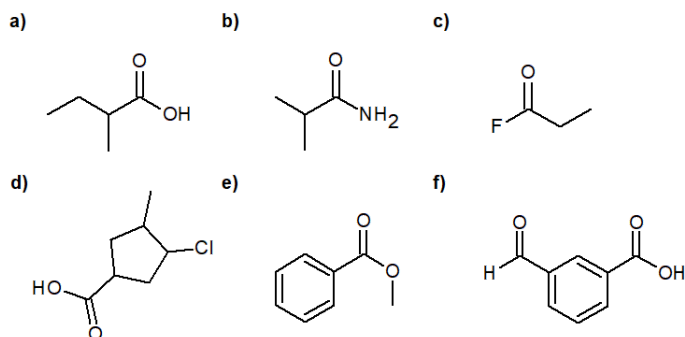
AMINES

3-27 Draw the structures given by the following IUPAC names.

1. 4-methylpentan-2-amine
2. N-ethyl-N-methylpropan-1-amine
3. 6-aminocyclohex-1-ene-1-carboxylic acid
4. (dimethylamino)acetonitrile

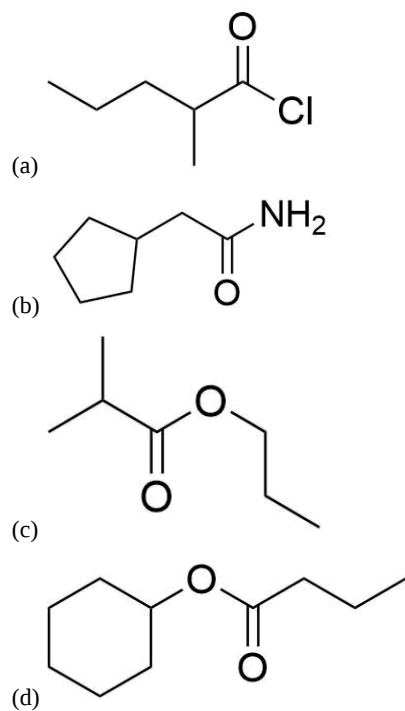
CARBOXYLIC ACIDS

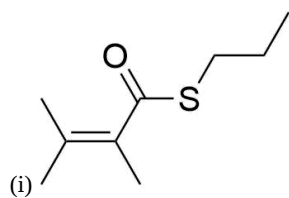
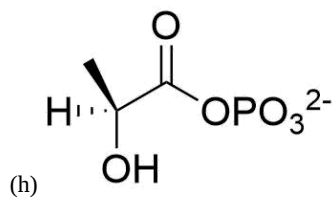
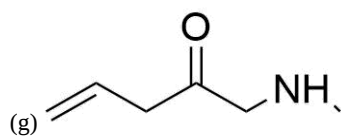
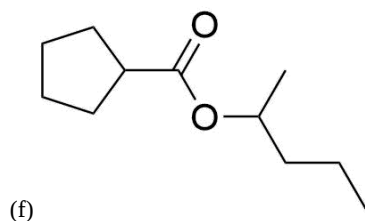
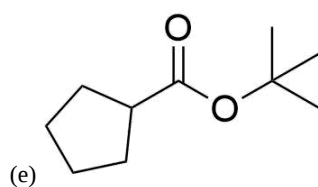
3-28 Give the correct IUPAC nomenclature for the following compounds.



CARBOXYLIC ACID DERIVATIVES

3-29 Name the following compounds using IUPAC conventions





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