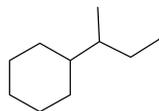


## 3.16: SOLUTIONS TO ADDITIONAL EXERCISES

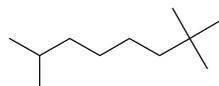
### ALKANE NOMENCLATURE

3-1 The structure that corresponds with each name is drawn below.

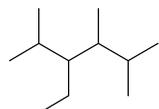
(a) sec-butylcyclohexane



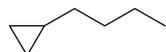
(b) 2,2,7-trimethyloctane



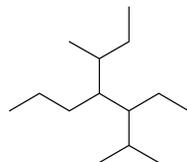
(c) 3-ethyl-2,4,5-trimethylhexane



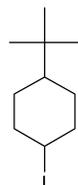
(d) 1-cyclopropylbutane



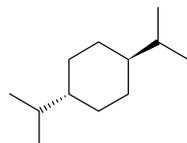
(e) 3-ethyl-2,5-dimethyl-4-propylheptane



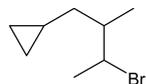
(f) 1-tert-butyl-4-iodocyclohexane



(g) trans-1,4-diisopropylcyclohexane



(h) 3-bromo-1-cyclopropyl-2-methylbutane



(i) Z-1,2-dichloro-1-methylcyclopentane



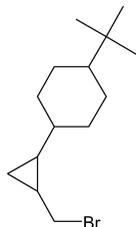
(j) 1-chloro-3-ethyl-3-methylhexane



(k) Norbornane (Bicyclo[2.2.1]heptane)



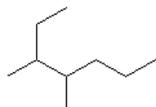
(l) 1-[2-(bromomethyl)cyclopropyl]-4-tert-butylcyclohexane



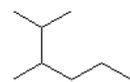
3-2 Give the IUPAC names of the following alkanes.

- (a) 5-ethyl-2,6-dimethyloctane
- (b) 3,4,7-trimethyl-6-(1-methylethyl)nonane
- (c) 4-(1-methylpropyl)-2,3-dimethyloctane
- (d) 1,3-dimethyl-2-(1-methylethyl)cyclobutane
- (e) 1-*tert*-butyl-4-ethyl-2-methylcyclopentane
- (f) *trans*-1,3-diethylcyclohexane
- (g) *cis*-1,4-di(1-methylethyl)cyclononane
- (h) 3-methylhexane

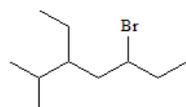
3-3 The following names are incorrect or incomplete, but they represent the real structures. Draw each structures and name it correctly.



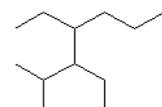
(a) 3,4-dimethylheptane



(b) 2,3-dimethylhexane



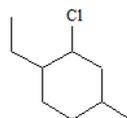
(c) 5-bromo-3-ethyl-2-methylheptane



(d) 3,4-diethyl-2-methylheptane



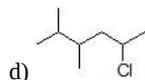
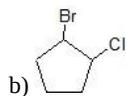
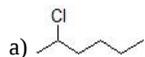
(e) 2,2,4-trimethylpentane



(f) 2-chloro-1-ethyl-4-methylcyclohexane

## ALKYL HALIDE NOMENCLATURE

3-4



3-5

a) 3-chloropentane

b) 1-chloro-3-methylcyclohexane

c) 5-chloro-2,2-dimethylhexane

d) (1R,2R)-1-bromo-2-methylcyclohexane

3-6

a) Secondary

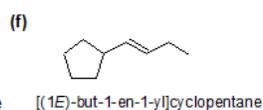
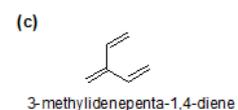
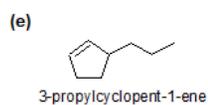
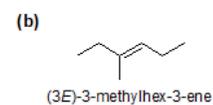
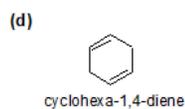
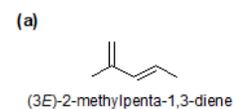
b) Primary

c) Tertiary

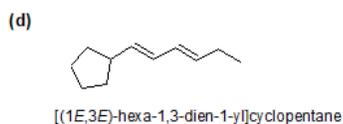
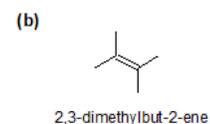
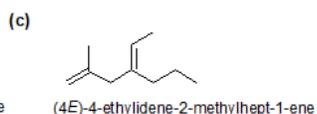
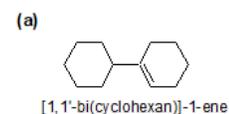
d) Tertiary

## ALKENE NOMENCLATURE

3-7



3-8



3-9

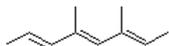
a) Z

b) Neither

c) E

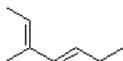
3-10

(a)



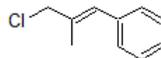
(2E,4E,6E)-3,5-dimethylocta-2,4,6-triene

(b)



(2E,4E)-3-methylhepta-2,4-diene

(c)

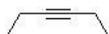


[(1E)-3-chloro-2-methylprop-1-en-1-yl]benzene

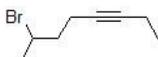
ALKYNE NOMENCLATURE

3-11

a)



b)



c)



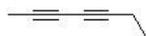
d)



e)



f)



3-12

- a) 1-chloropent-3-yne
- b) 2,2-dimethyl-6-methyl-hex-4-yne
- c) cyclohexylhept-1-yne
- d) 4-bromo-2-chloro-3-methylnon-7-yne

Alcohol and Phenol Nomenclature

3-13

- a) Primary
- b) Secondary
- c) Tertiary
- d) Secondary

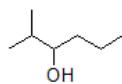
3-14

(a)



butan-1-ol

(b)



2-methylhexan-3-ol

(c)



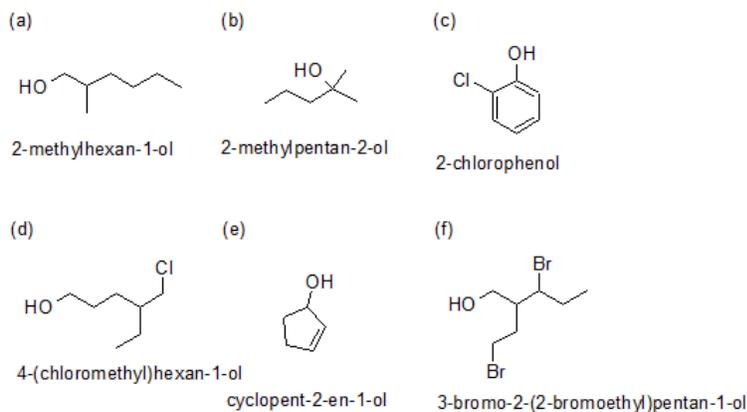
4-bromopentan-2-ol

(d)

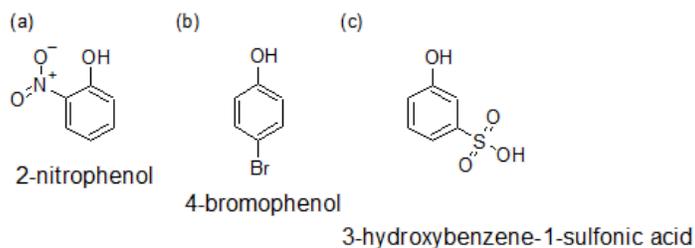


cyclopentanol

3-15

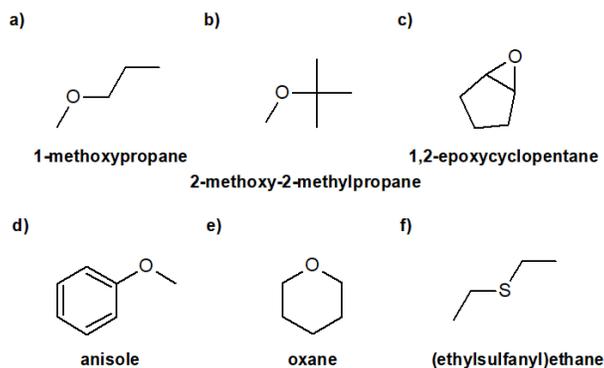


3-16



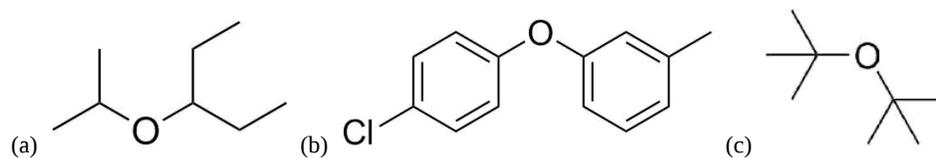
## ETHERS

3-17



- (g) oxydicyclopentane  
(h) 2-phenyloxirane  
(i) 1-cyclohexylethane-1-thiol

3-18



3-19

- (a) diisopropylsulfide (b) 1,3-dimethoxybenzene (c) 2-Methyltetrahydro-2H-pyran (d) methyl 3-sulfanylbenzoate (e) methyl(phenyl)sulfide

## BENZENE AND ITS DERIVATIVES

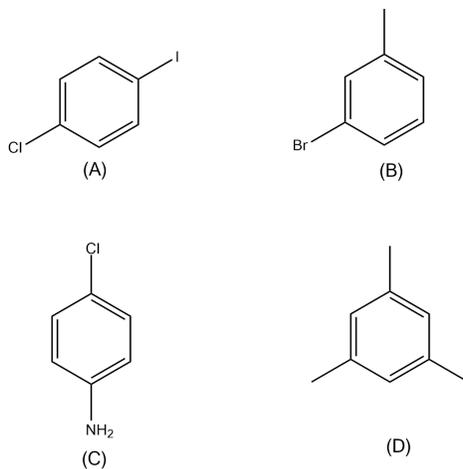
3-20

A – meta; B – para; C – ortho

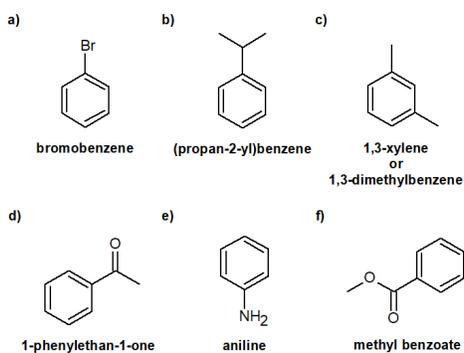
3-21

- 1,3-Dibromobenzene
- 1-phenyl-4-methylhexane
- 1,4-Dichloro-2,5-dimethylbenzene
- 2-methyl-1,3,5-trinitrobenzene. (Also known as trinitrotoluene, or TNT)

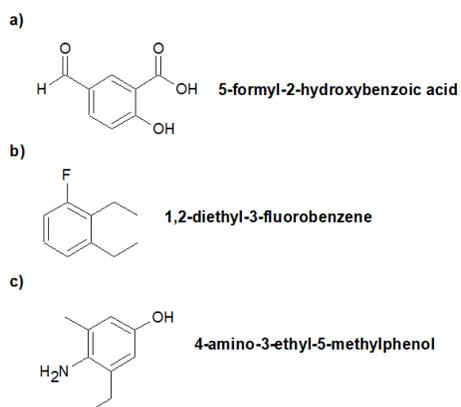
13-22



3-23



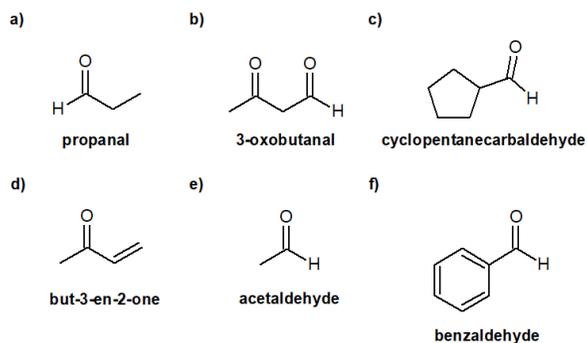
3-24



3-25 In order of priority: Benzoyl bromide > Amino > Nitro

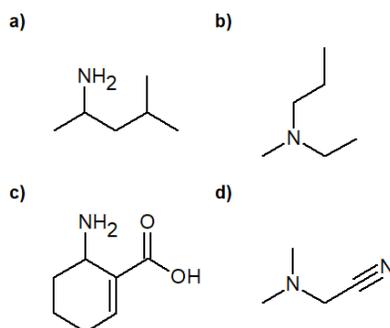
## ALDEHYDES AND KETONES

3-26



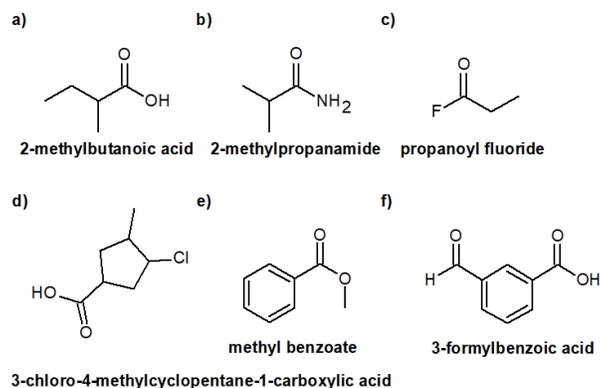
## AMINES

3-27



## CARBOXYLIC ACIDS

3-28



## CARBOXYLIC ACID DERIVATIVES

3-29

- 3-methylpentanoyl chloride
- 2-cyclopentylacetamide
- propyl 2-methylpropanoate
- cyclohexylbutanoate
- tert-butyl cyclopentanecarboxylate
- 1-methylbutylcyclopentane carboxylate
- N-methyl-3-butenamide
- (S)-2-hydroxypropanoyl phosphate
- propyl 2,3-dimethyl-2-butenethioate

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