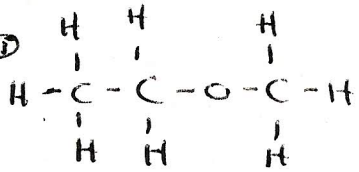
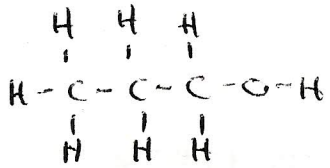
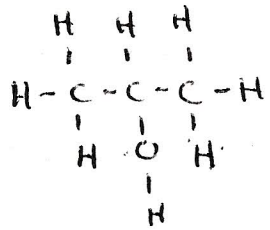
ORGANIC CHEM - EXAM REVIEW

Chapter 9

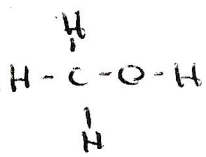
13. Study of all compounds containing Carbon.

14. ① 

② 

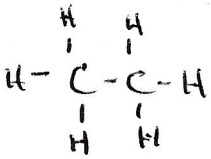
③ 

15. a) CH_3OH



alcohol
methanol

b) C_2H_6

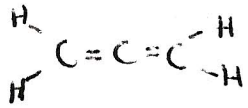


alkane
ethane

c) $C_6H_5CH_3$

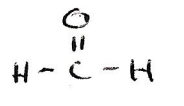
aromatic
methylbenzene

d) C_3H_4



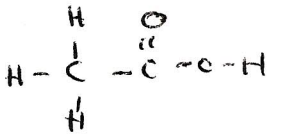
propadiene
alkene

e) $HCHO$



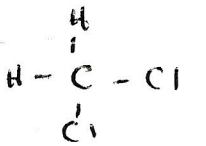
methanal
aldehyde

f) CH_3COOH



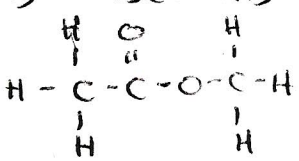
ethanoic acid
carboxylic acid

h) CH_2Cl_2

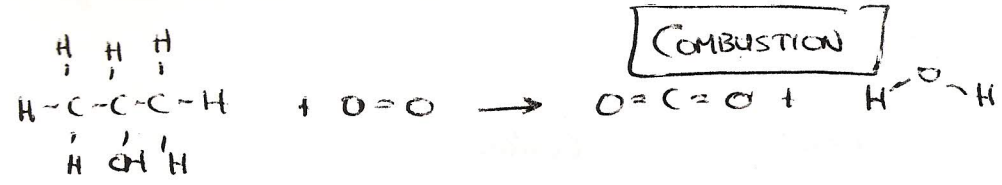


dichloromethane
organic halide

i) CH_3COOCH_3

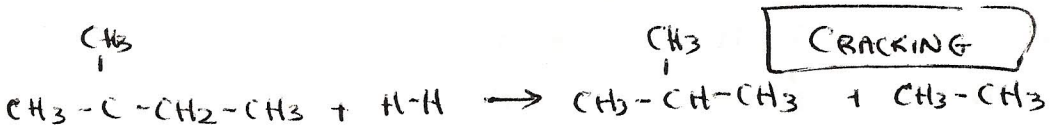


methyl ethanoate
ester

16. c) 

COMBUSTION

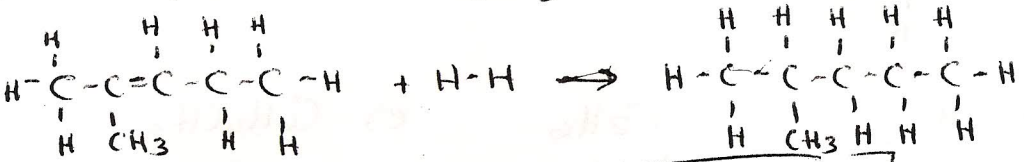
2-propanol + oxygen → carbondioxide + water vapor

b) 

CRACKING

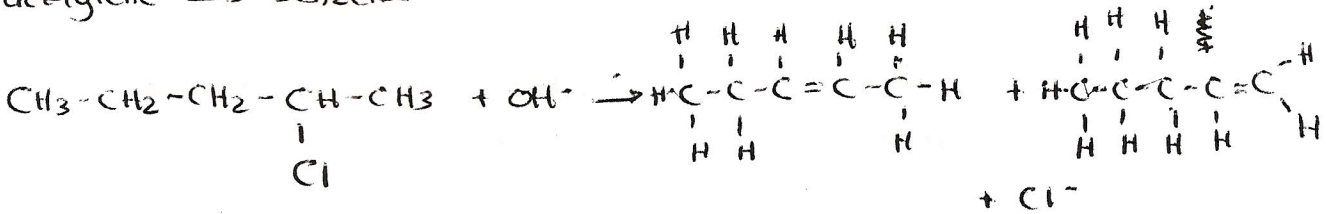
2,2-dimethylbutane + hydrogen → methylpropane + ethane

c) 2-methyl-2-pentene + hydrogen → 2-methylpentane



ADDITION

~~d) acetylene → benzene~~

e) 

2-chloropentane + hydroxide ion → 2-pentene + 1-pentene + chloride ion + water

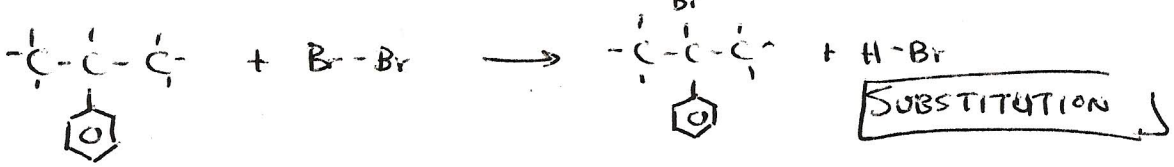
ELIMINATION

f) 

1-butene + hydrogen chloride → 1-chlorobutane + 2-chlorobutane

ADDITION

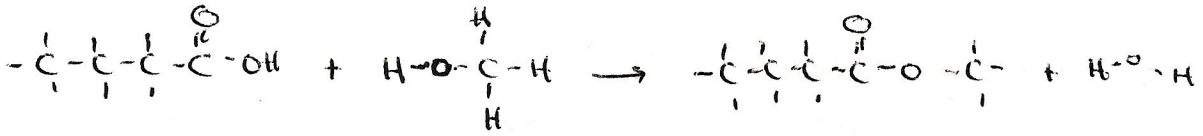
g) 2-phenylpropane + bromine → 2-bromo-2-phenylpropane + hydrogen bromide



SUBSTITUTION

h) 1-propanol → propene + water **ELIMINATION**

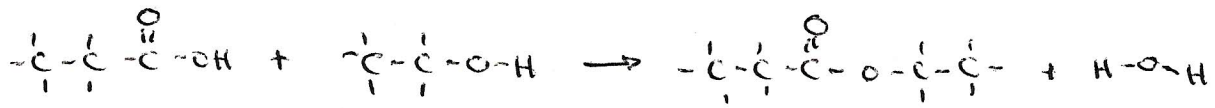
i) butanoic acid + methanol → methyl butanoate + water



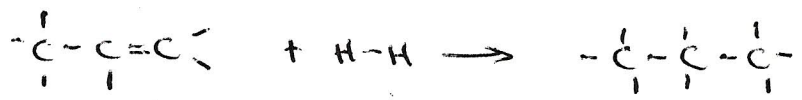
ESTERIFICATION

* 17. A large structure with a large molecular mass, containing many repeating units called monomers.

B 1. a) $CH_3CH_2COOH + CH_3CH_2OH \rightarrow$



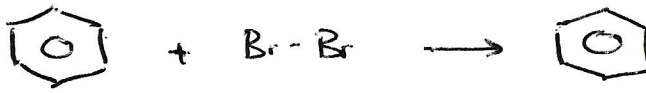
b) $CH_3CHCH_2 + H_2 \rightarrow CH_3CH_2CH_3$



c) $CH_3Cl + Cl_2 \rightarrow CH_2Cl_2 + HCl$

d) $CH_3(CH_2)_{10}CH_3 + H_2 \rightarrow CH_3(CH_2)_3CH_3 + CH_3(CH_2)_6CH_3$

B. 2. a) Benzene + bromine → bromobenzene + hydrogen bromide

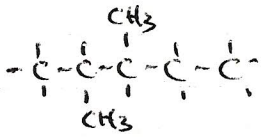
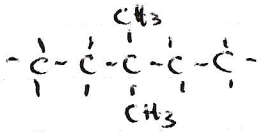
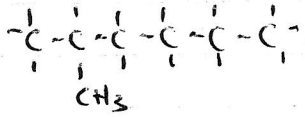
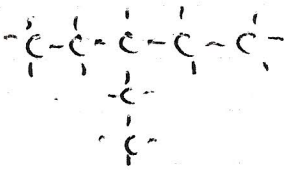


b) Ethanol + methanoic acid → ethyl methanoate + water

Review Problems

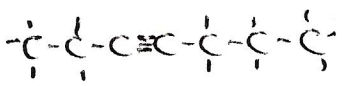
*1 a) 3,4-dimethylhexane
b) 2,2,3-trimethylpentane
c) 2,2-dimethylbutane
d) diethylhexane
e) 2,3,4-trimethylhexane
f) 3,4,5-trimethylheptane
g) 3,4,5-trimethylheptane
h) 2,3,4-trimethylhexane

2. a) 2-methylpentane
b) methylbutane
c) 2,3-dimethylpentane
g) 3-methylpentane
d) ethylpentane
e) 2,4-dimethylpentane
f) 2,3-dimethylpentane
h) 2,3-dimethylpentane

*3 a) heptane
b) 2,4-dimethylpentane
c) 2,2,3-trimethylbutane
d) 
e) 
f) 3-methylhexane
g) 2,2-dimethylpentane
h) 
i) 

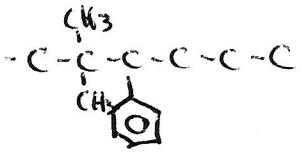
*4. a) $CH_3CH=CHCH_2CH_3$
2-pentene
b)  1,2-dimethylbenzene
c)  cyclohexane
d)  2-phenylethyne
e)  cyclobutene
f) $CH\equiv CCH_3$
propyne

*5 a) 3-heptyne



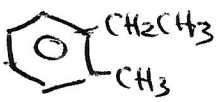
b) cyclopentene

c) 3-phenyl-2,2-dimethylhexane

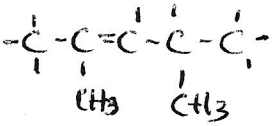


d) 1,3-butadiene

e) 1-ethyl-2-methylbenzene



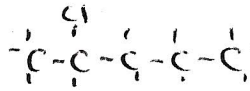
f) 2,4-dimethyl-2-pentene



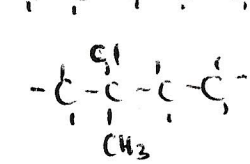
*6. a) 1-chloropentane

b) 1-chloro-3-methylbutane

c)



d)

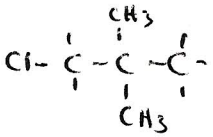


e) 3-chloropentane

f) 2-chloro-3-methylbutene

g)

h)



*7. a) 1-bromo-3-ethyl-3-methylpentane

b) 3-methyl-1,4-pentadiene

c) 4,4-dimethyl-1-butene

d) chlorobenzene

e) 2-pentene

f) methyl-2-butene

g) 1-butene

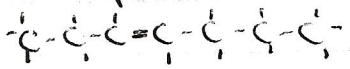
h) 4-methyl-2-butene

i) 2,3-dimethyl-2-pentene

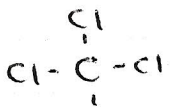
j) 2,4-dimethyl-1,4-pentadiene

k) 2,3,3-trimethyl-1,4, hexadiene

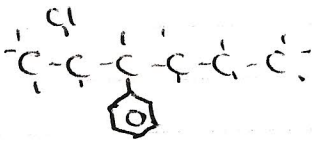
*8. a) 3-heptene



b) trichloromethane



d) 2-chloro-3-phenylhexane

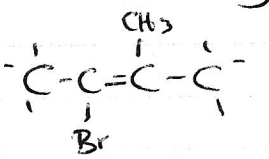


e) 1,3-cyclopentadiene

f) methylbenzene

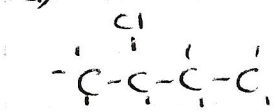
g) 1,4-dibromobenzene

h) 2-bromo-3-methyl-2-butene

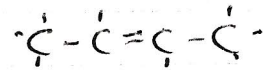


Chapter Review Problems.

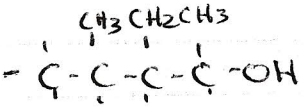
*1 a) 2-chlorobutane



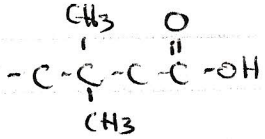
b) 2-butene



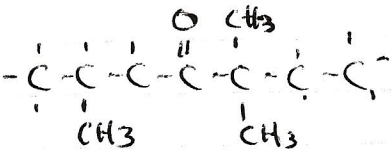
c) 2-ethyl-3-methyl-1-butanol



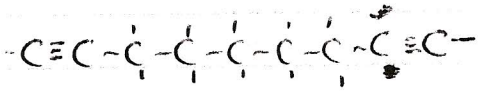
d) 3,3-dimethylbutanoic acid



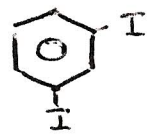
e) 2,5,5-trimethyl-4-heptanone



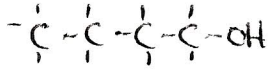
f) 1,8-nonadiyne



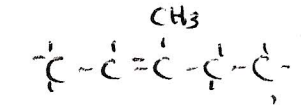
g) 1,3-diiodobenzene



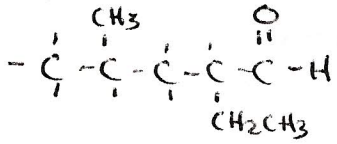
i) 1-butanol



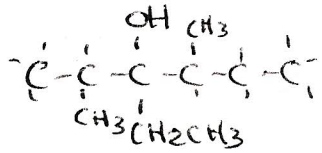
j) 3-methyl-2-pentene



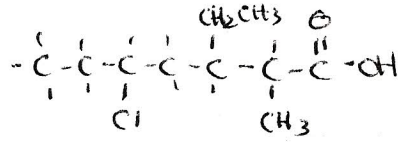
k) 2-ethyl-4-methylpentanal



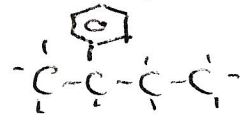
l) 3-ethyl-2,4-dimethyl-3-hexanol



m) 5-chloro-3-ethyl-2methylheptanoic acid



n) 2-phenylbutane



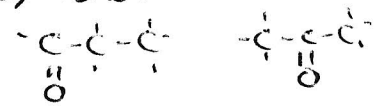
2 a) 2-methyl-3-pentanol
b) 2-methyl-3-pentanone
c) 3-methyl-1-butene
d) butanal
e) 4,4-dimethyl-1-propanol
f)

3 a) 1-chloro-2-methylbutane
b) 1-bromo-2,3,3-trimethylbutane
c) bromocyclopropane
d) 3-chloropentane
e) 2-butanol
f) 3-bromo-2-pentene
g) pentane
h) butanone

4 a) C_2H_6O

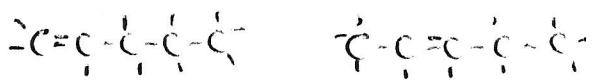
dimethylether ethanol

b) C_3H_6O



propanal propanone

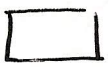
*4. c) C_5H_{10}



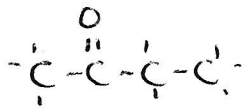
1-pentene 2-pentene

*5 a) ethanal

b) cyclobutane

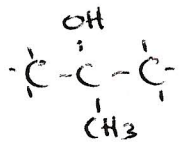


b) 2-butanone



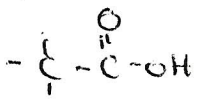
i) cyclohexene

c) 2-methyl-2-propanol



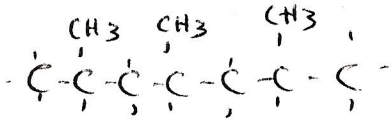
j)

d) ethanoic acid

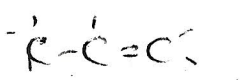


e) trimethylheptane

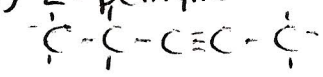
* many possibilities



f) propene



g) 2-pentyne



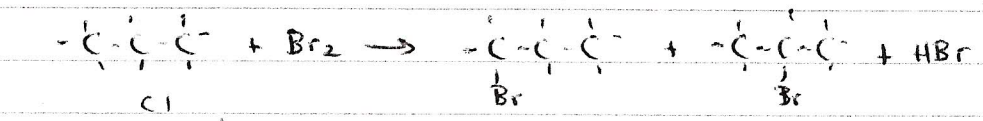
Review Organic Chemistry Ch. 9

C*1 a) CRACKING $C_4H_{10} + H_2 \rightarrow C_2H_6 + C_2H_4$

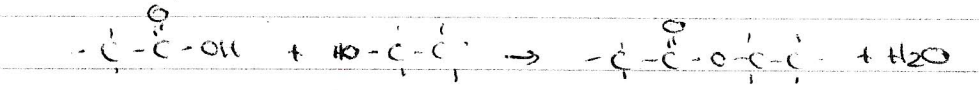
b) REFORMING $C_3H_8 + C_2H_6 \rightarrow C_5H_{12} + H_2$

c) COMBUSTION $C_5H_{12} + O_2 \rightarrow CO_2 + H_2O$

d) ADDITION 

e) SUBSTITUTION 

f) ELIMINATION 

g) ESTERIFICATION 

C*2 Aliphatic → 

Aromatic → 

C*4. a) Alkene → C_nH_{2n}

b) Aromatic → C_nH_{2n} (cycloalkane)

c) Alcohol → C_xH_yOH

d) Carboxylic acid → C_xH_yCOOH