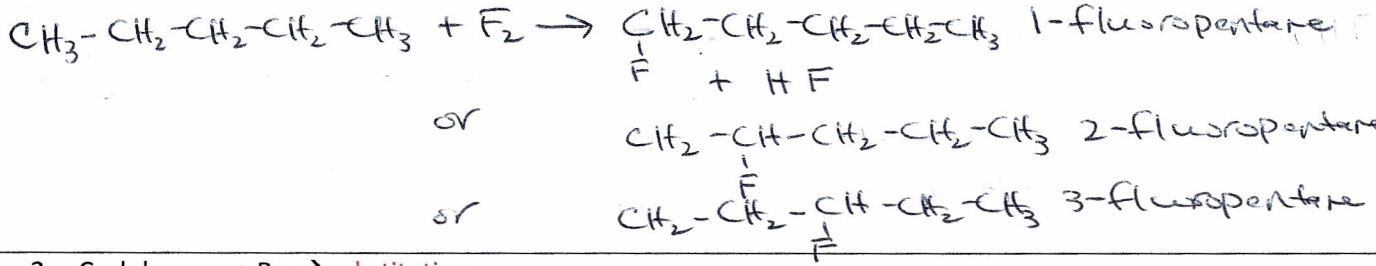
# Assignment: Reactions Involving Organic Compounds

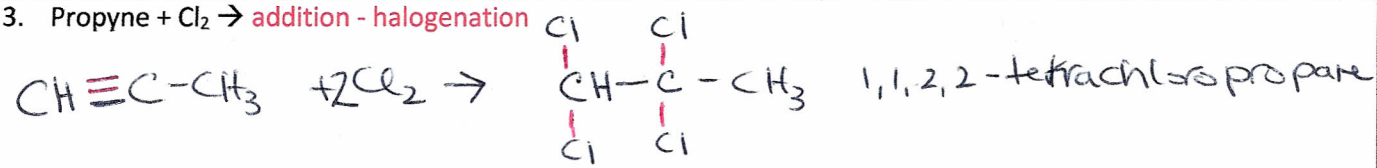
**Complete each of the following reactions by writing the condensed structural formulas for the reactants and products. Name each of the products. Identify the type of reaction: substitution, addition, hydrogenation, halogenation, hydration, dehydration, condensation, combustion, controlled oxidation, and esterification.**

1. Pentane + $F_2$ → Substitution

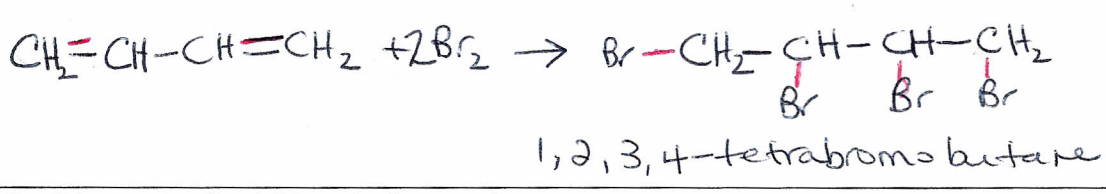



2. Cyclohexane + $Br_2$ → substitution

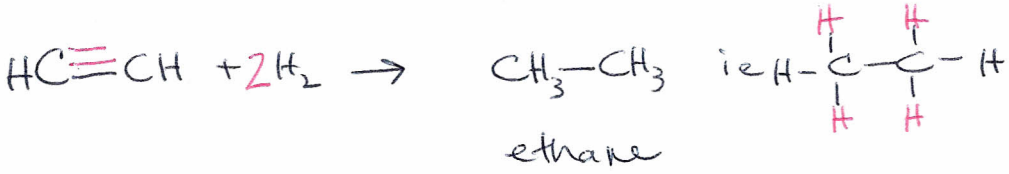

3. Propyne + $Cl_2$ → addition - halogenation



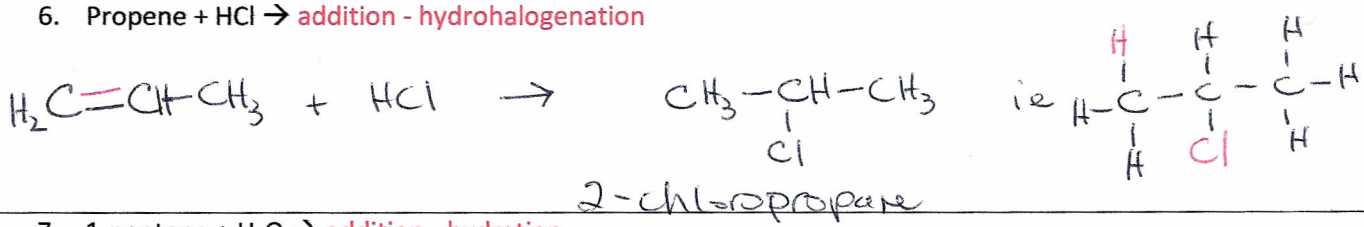

4. 1,3-butdiene + $Br_2$ → addition - halogenation



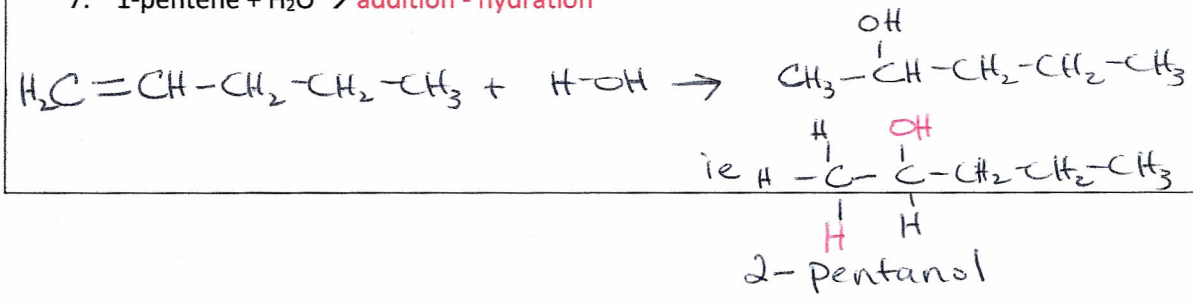

5. Ethyne + $H_2$ → addition - hydrogenation



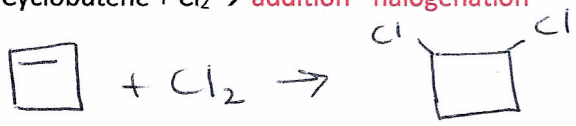

6. Propene + HCl → addition - hydrohalogenation




7. 1-pentene + $H_2O$ → addition - hydration

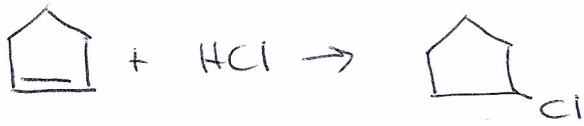


8. Cyclobutene + $Cl_2$ → addition - halogenation



1,2-dichlorocyclobutane

9. Cyclopentene + HCl → addition - hydrohalogenation



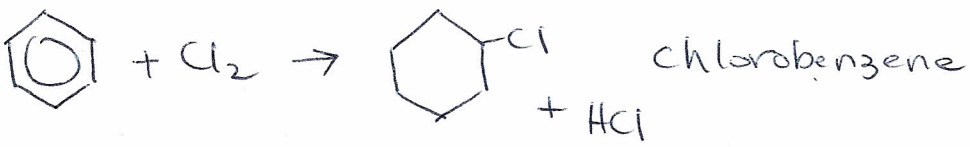
chlorocyclopentane

10. Propyne + $O_2$ → combustion

$HC\equiv C-CH_3 + O_2 \rightarrow CO_2 + H_2O$

$C_3H_4 + 4O_2 \rightarrow 3CO_2 + 2H_2O$

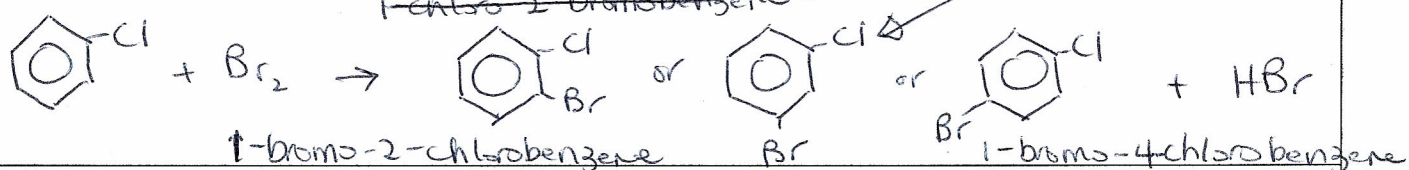
11. Benzene + $Cl_2$ → substitution - halogenation



chlorobenzene

12. Chlororbenzene + $Br_2$ → substitution - halogenation

~~1-chloro-2-bromobenzene or 1,3-di~~ 1-bromo-3-Chlorobenzene



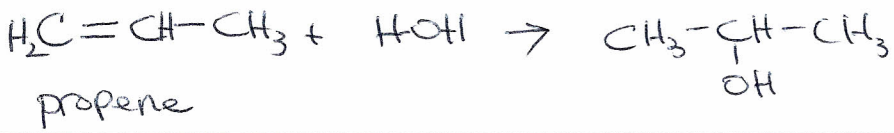
1-bromo-2-chlorobenzene

1-bromo-4-chlorobenzene

13. Benzene + chloromethane → substitution – (alkylation)

methylbenzene

14. _____ + _____ → 2-propanol addition - hydration

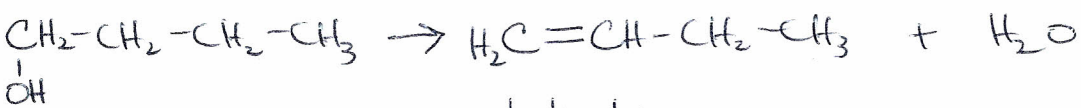


propene

15. Ethanol + $O_2$ → combustion

$2CH_3CH_2OH + 7O_2 \rightarrow 4CO_2 + 6H_2O$

16. 1-butanol → dehydration

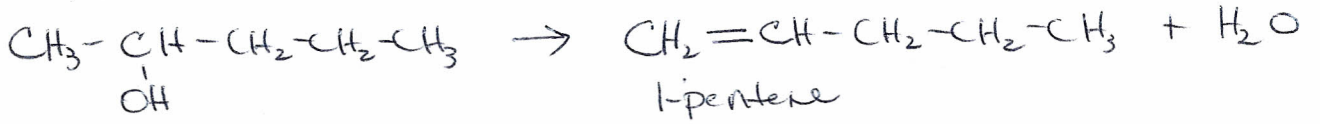


1-butene

2-pentene

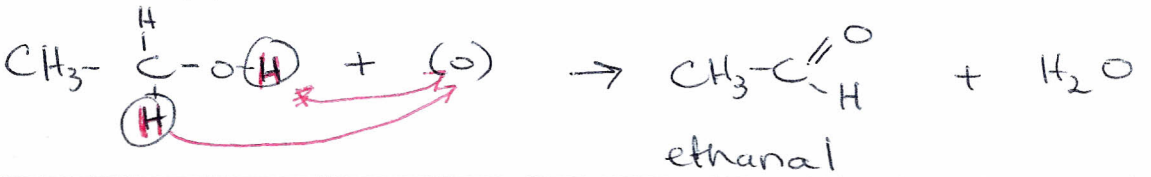
$CH_3-CH=CH-CH_2CH_3$

17. 2-pentanol → dehydration

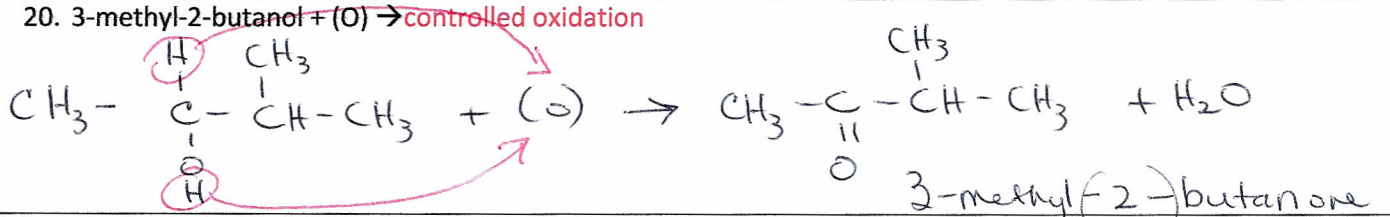



18. _____ + _____ → 2-butanol addition - hydration

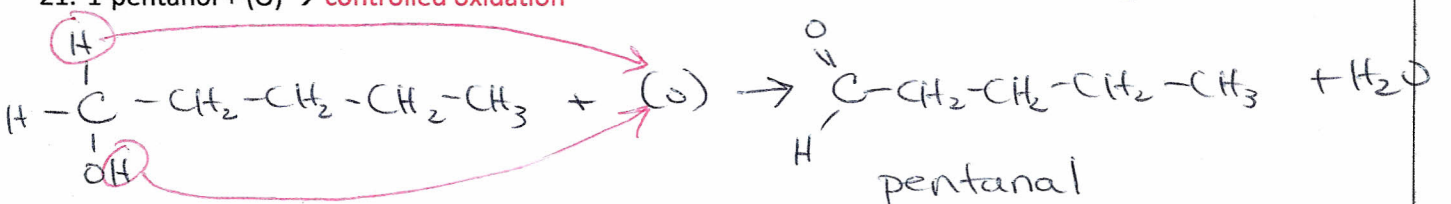

19. Ethanol + (O) → controlled oxidation



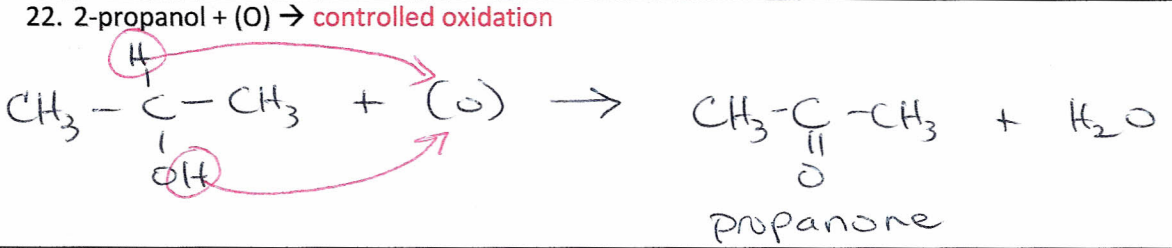

20. 3-methyl-2-butanol + (O) → controlled oxidation



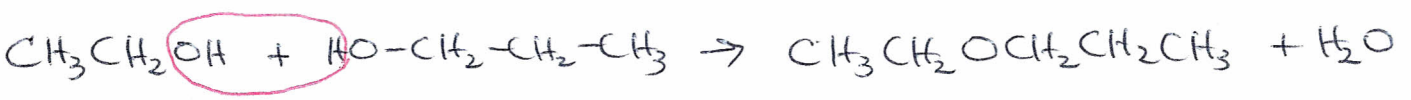

21. 1-pentanol + (O) → controlled oxidation



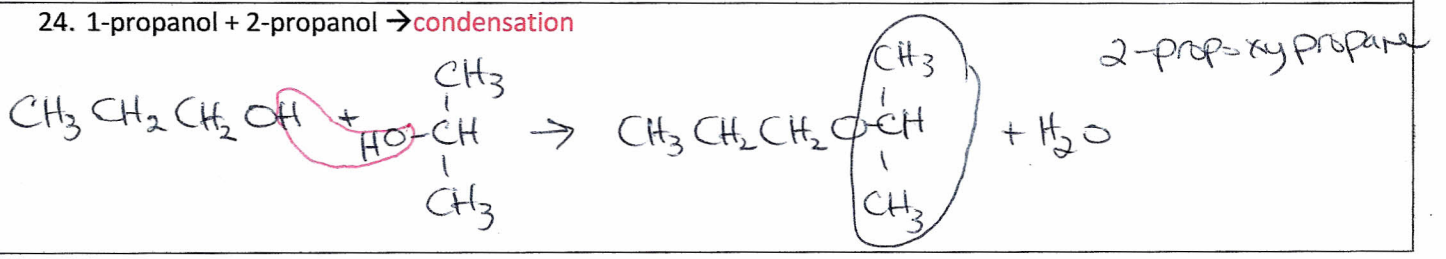

22. 2-propanol + (O) → controlled oxidation



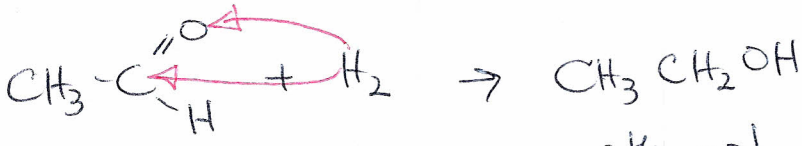

23. Ethanol + 1-propanol → condensation




24. 1-propanol + 2-propanol → condensation

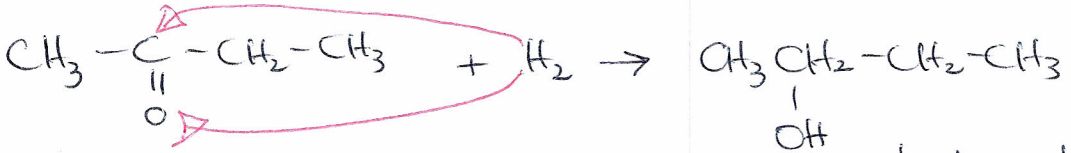


25. Ethanal + $H_2$ → addition - hydrogenation



ethanol

26. 2-butanone + $H_2$ → addition - hydrogenation

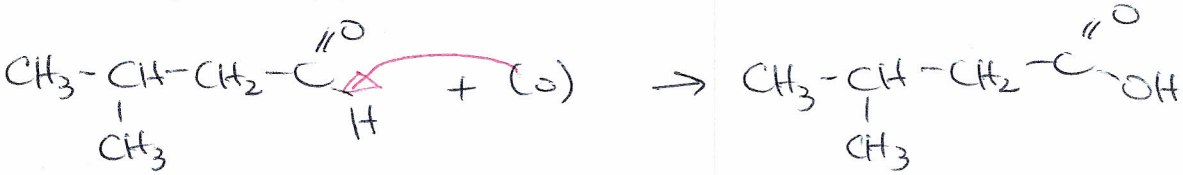


2-butanol

27. Propanal + (O) → controlled oxidation

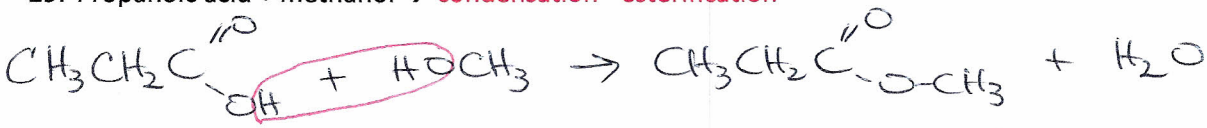
propanoic acid

28. 3-methylbutanal + (O) → controlled oxidation



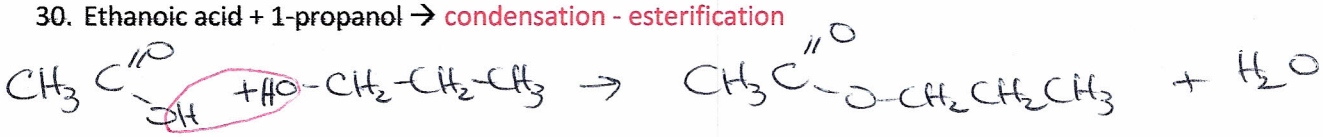
3-methylbutanoic acid

29. Propanoic acid + methanol → condensation - esterification



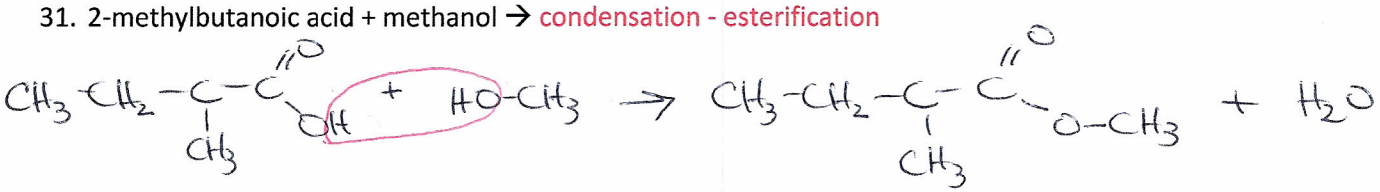
methyl propanoate

30. Ethanoic acid + 1-propanol → condensation - esterification



propyl ethanoate

31. 2-methylbutanoic acid + methanol → condensation - esterification



methyl-2-methylbutanoate