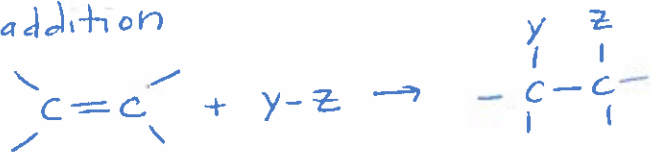


1. c 2. $R-OH \rightarrow R=R + H_2O$ 3. a 4. d 5. d 6. a (Le Chatelier)
 elimination
 d

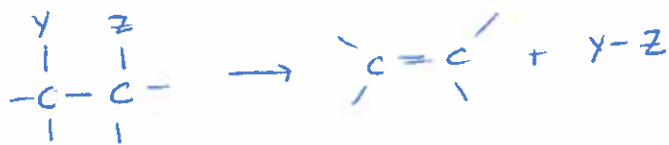
7. c 8. b 9. b 10. b 11. a 14. a

15. a) addition



Carbon atoms in the product are bonded to more atoms

b) elimination



Carbon atoms in the product are bonded to fewer atoms

c) substitution



subbing out an atom for another

d) condensation



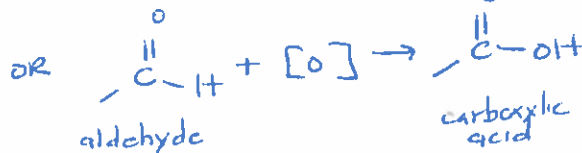
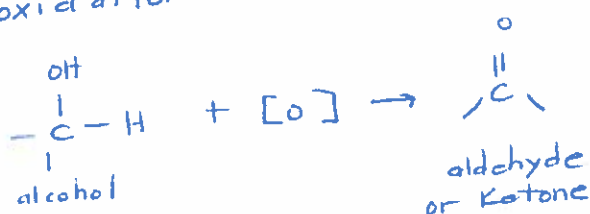
carboxylic acid + amine \rightarrow amide + water

e) esterification



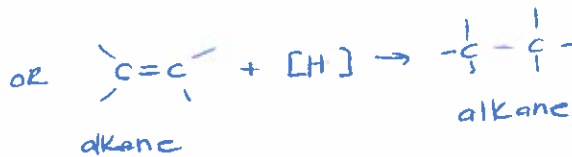
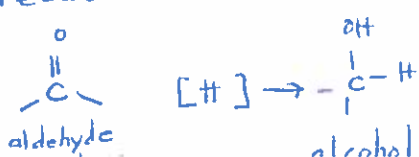
carboxylic acid + alcohol \rightarrow ester + water

f) oxidation



more bonds to O or fewer to H

g) reduction



fewer bonds to O or more bonds to H

h) combustion



16. Addition & elimination are opposite reactions

↳ adding to multiple bonds leads to single/double bonds

↳ elimination makes = or ≡

17. Markovnikov's rule → add H to the carbon atom already bonded to the most H atoms

→ remove H from the carbon with the most bonds to C

18. too many varied products

19. condensation & esterification - both lose H₂O
carboxylic + amine
acide carboxylic acid + alcohol

20. hydrolysis add H₂O to break up a molecule
H on one side & OH on the other

21. add poly in front of the monomers name

22. they are still long chains of repeating smaller molecules

23. a) substitution e) addition
b) elimination f) elimination
c) addition
d) substitution

24. a) oxidation c) oxidation
b) reduction

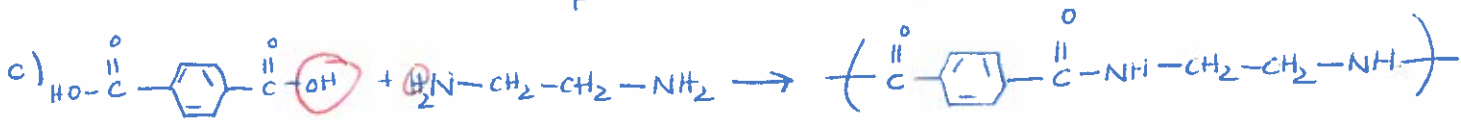
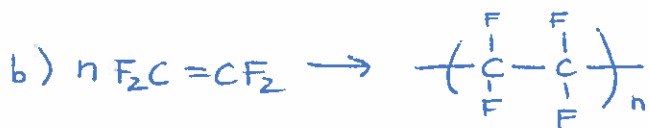
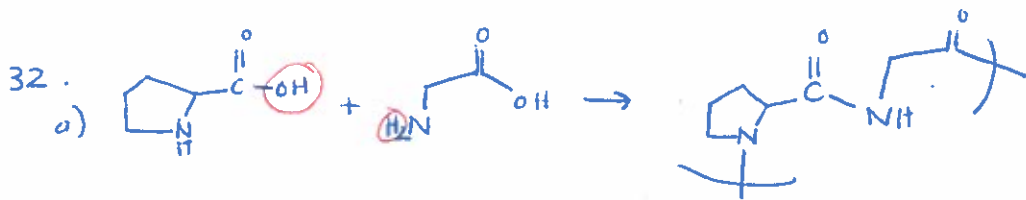
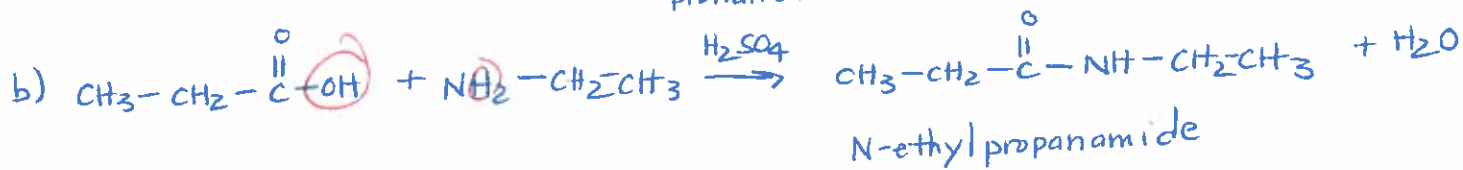
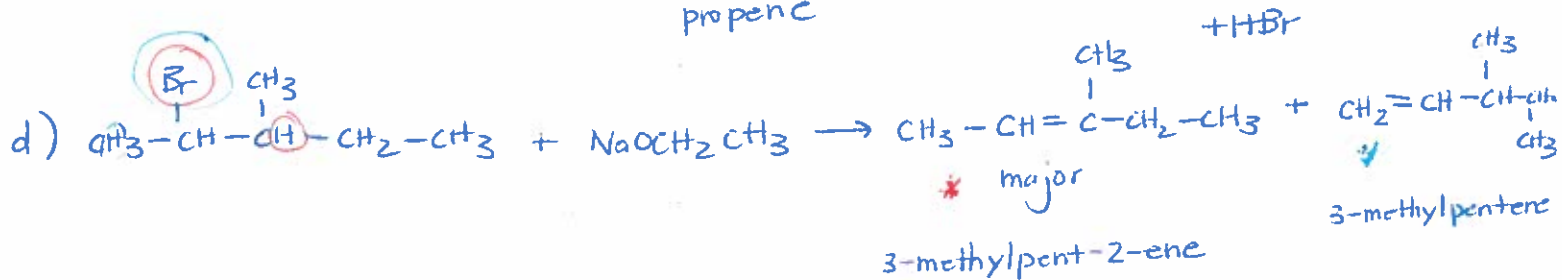
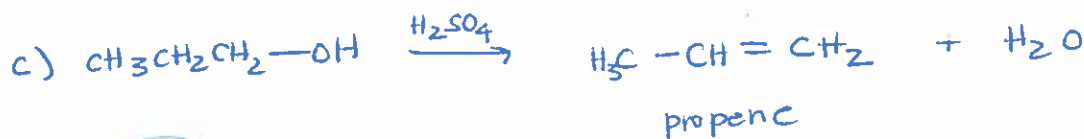
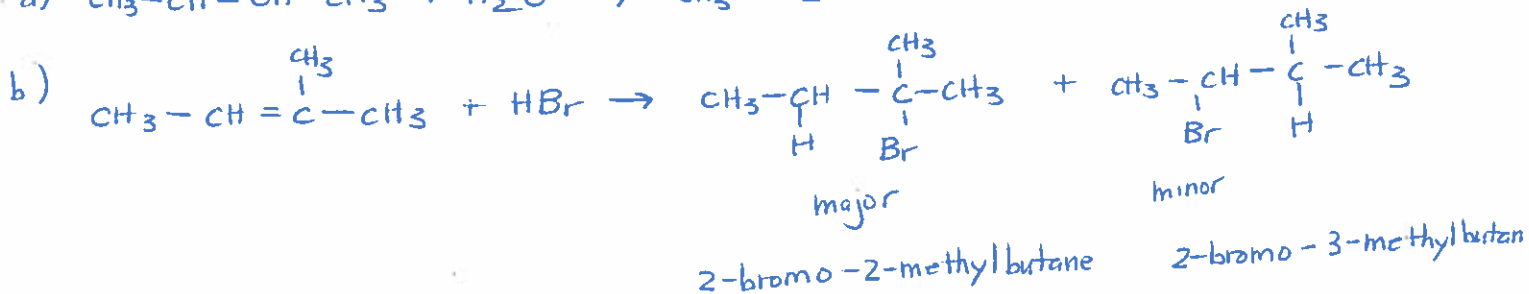
25. a) esterification c) hydrolysis
b) condensation

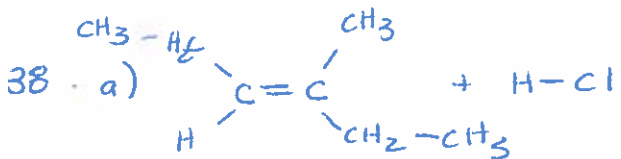
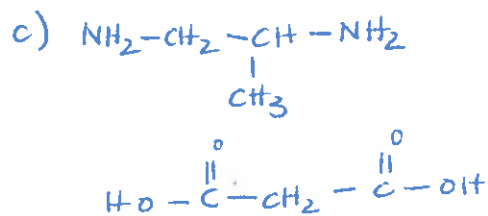
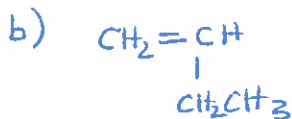
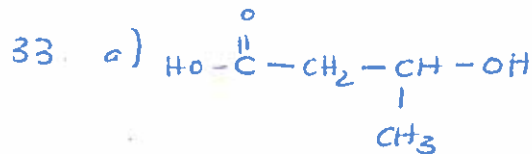
26. polyvinylacetate

27. polyester polyamide
- both long chains
- both lose H₂O
- both use $\text{HO}-\overset{\text{O}}{\parallel}{\text{C}}-\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH}$ $\text{NH}_2-\text{R}'-\text{NH}_2$
 $\text{HO}-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH}$

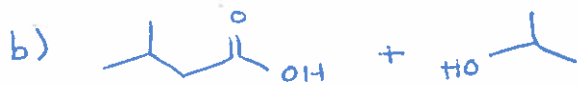
28. a) addition
 b) condensation
 c) addition

29. a) alkyl halide → alkene elimination
 b) alkene → alcohol addition
 c) alkane → carbon dioxide combustion
 d) alcohol → alkyl halide substitution



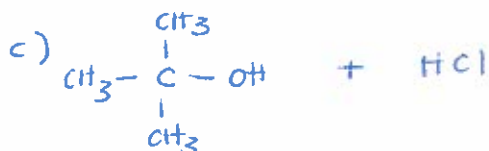


hex-3-ene

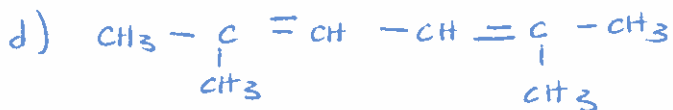


3-methylbutanoic acid

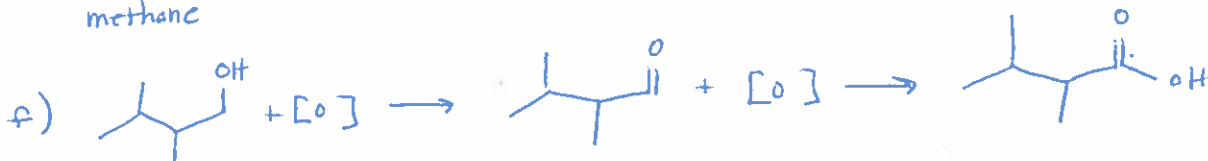
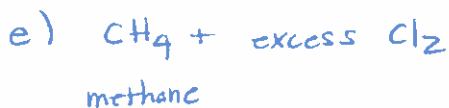
propan-2-ol



2-methylpropan-2-ol

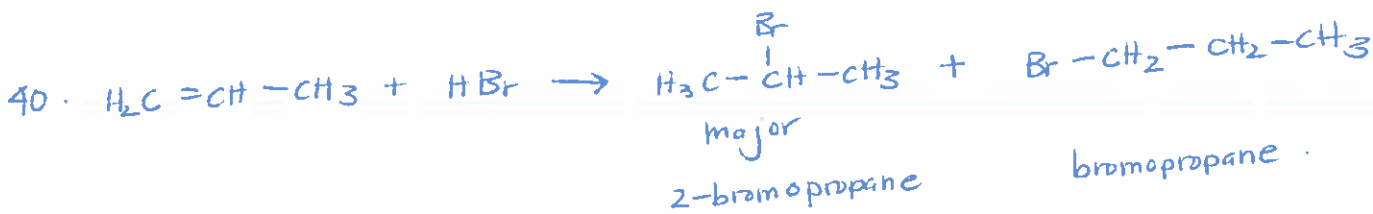


2,5-dimethylhex-2,4-diene



2,3-dimethylbutanol

2,3-dimethylbutanal



43 a) ethanol 2-phenylacetic acid. b) ethanol butyric acid.

c) ethanol acetic acid



44. $\text{H}_2\text{C}=\text{CH}-\text{CH}=\text{CH}_2$ (1,3-butadiene)