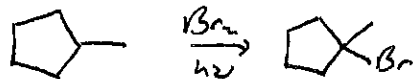


Synthesis Problems

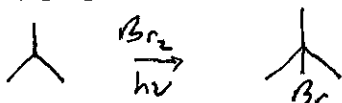
Working synthesis problems is an excellent way to learn reactions. Show how the following syntheses can be performed. More than one step will usually be required. Show all reagents and all intermediate compounds in your synthetic scheme.

Alkanes and Alkenes

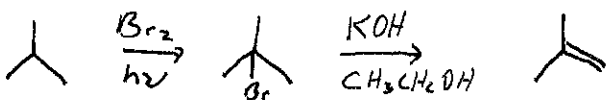
1. methylcyclopentane $\xrightarrow{??}$ 1-bromo-1-methylcyclopentane



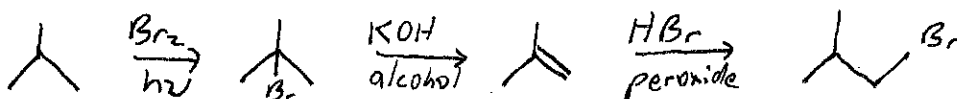
2. 2-methylpropane $\xrightarrow{??}$ 2-bromo-2-methylpropane



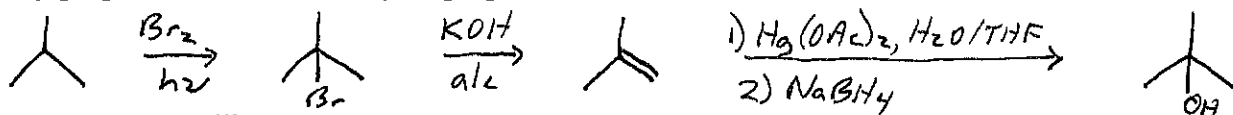
3. 2-methylpropane $\xrightarrow{??}$ 2-methylpropene



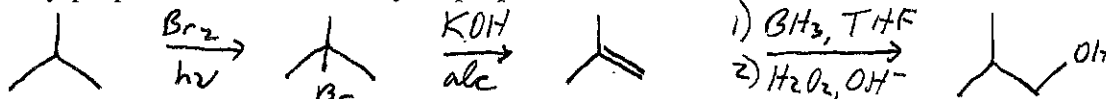
4. 2-methylpropane $\xrightarrow{??}$ 1-bromo-2-methylpropane



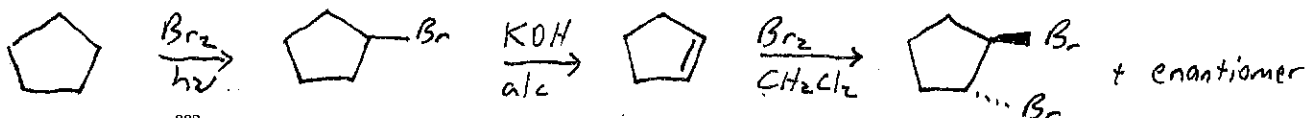
5. 2-methylpropane $\xrightarrow{??}$ 2-methyl-2-propanol



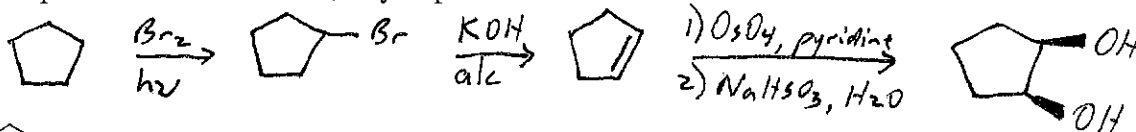
6. 2-methylpropane $\xrightarrow{??}$ 2-methyl-1-propanol



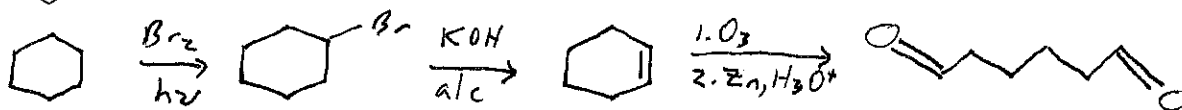
7. cyclopentane $\xrightarrow{??}$ *trans*-1,2-dibromocyclopentane



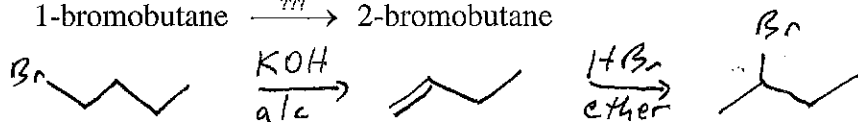
8. cyclopentane $\xrightarrow{??}$ *cis*-1,2-cyclopentanediol



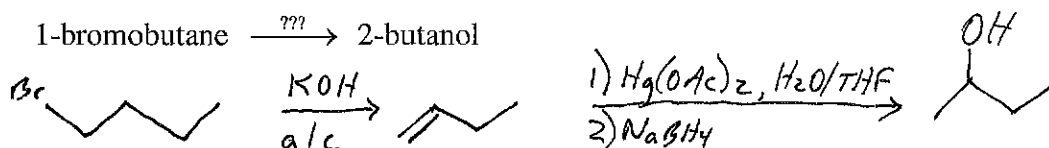
9. cyclohexane $\xrightarrow{??}$ hexanedial



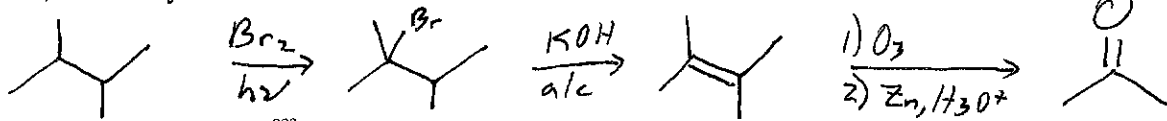
10. 1-bromobutane $\xrightarrow{??}$ 2-bromobutane



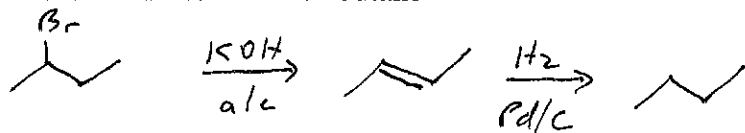
11. 1-bromobutane $\xrightarrow{??}$ 2-butanol



12. 2,3-dimethylbutane $\xrightarrow{???}$ acetone

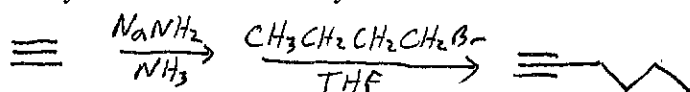


13. 2-bromobutane $\xrightarrow{???}$ butane

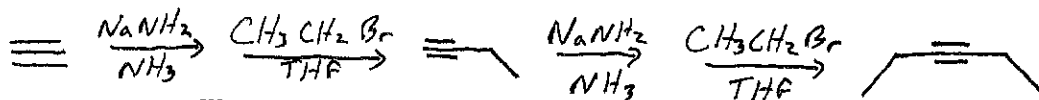


Alkynes

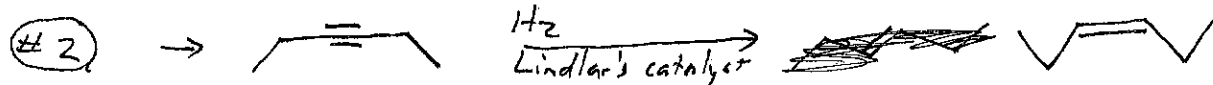
1. acetylene $\xrightarrow{???}$ 1-hexyne



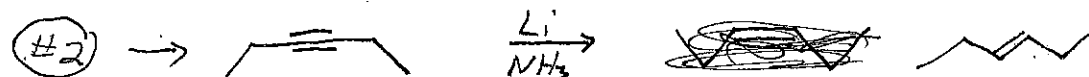
2. acetylene $\xrightarrow{???}$ 3-hexyne



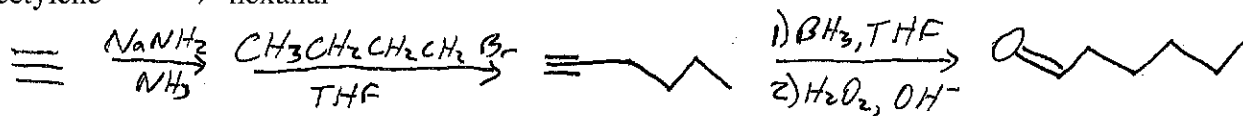
3. acetylene $\xrightarrow{???}$ cis-3-hexene



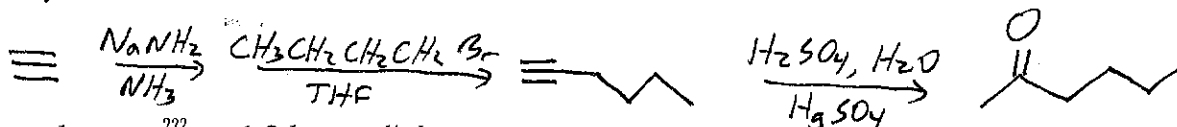
4. acetylene $\xrightarrow{???}$ trans-3-hexene



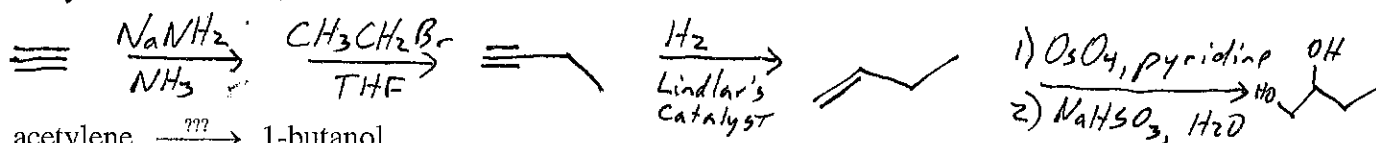
5. acetylene $\xrightarrow{???}$ hexanal



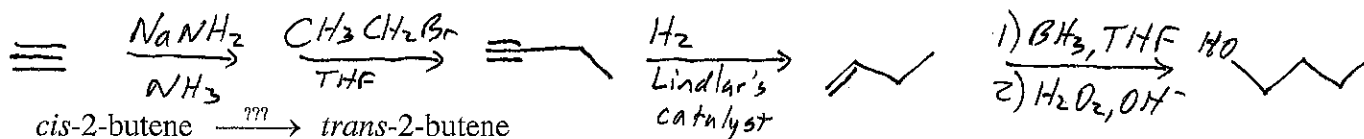
6. acetylene $\xrightarrow{???}$ 2-hexanone



7. acetylene $\xrightarrow{???}$ 1,2-butanediol



8. acetylene $\xrightarrow{???}$ 1-butanol



9. cis-2-butene $\xrightarrow{???}$ trans-2-butene

