

15.13: ADDITIONAL EXERCISES

Industrial Synthesis of Ethers using Bimolecular Condensation

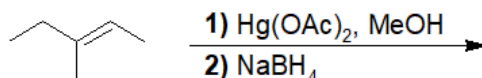
15-1 Give the final product of the following reaction.



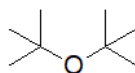
15-2 Draw the mechanism for the reaction in the previous problem, 15-1.

Synthesis of Ethers by Alkoxymercuration-Demercuration

15-3 Predict the product of the following reaction and give its correct IUPAC nomenclature.



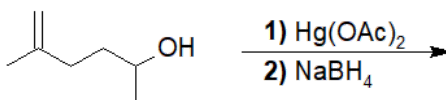
15-4 Propose a route of synthesis (that includes an alkoxymercuration-demercuration reaction) for the following ether starting with a carbon molecule containing no more than 3 carbons.



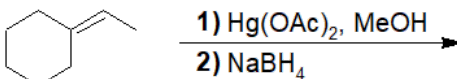
2-tert-butoxy-2-methylpropane

15-5 Predict the products of the following reactions.

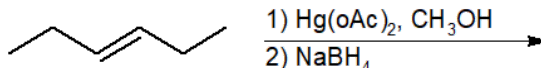
a)



b)

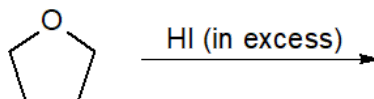


15-6 Give the final product for the following reaction.



Cleavage of Ethers

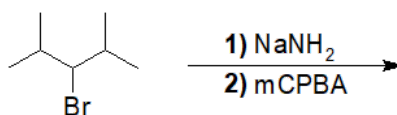
15-7 Choose the correct IUPAC name for the product of the following reaction.



- a) Butan-1-ol
- b) 1-iodobutane
- c) 1,4-diiodobutane
- d) 2-iodooxolane

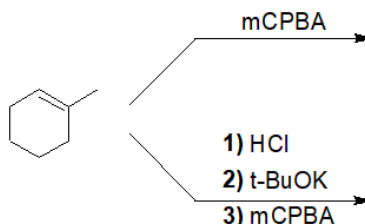
Synthesis of Epoxides

15-8 Choose the correct IUPAC nomenclature of the product of the following reaction and provide its structure.

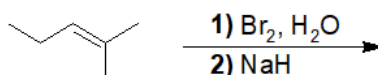


- a) 2,2-dimethyl-3-(propan-2-yl)oxirane
- b) 2,4-dimethylpentan-2-ol
- c) 2,4-dimethylpent-2-en-3-ol
- d) 2-methyl-2-(2-methylpropyl)oxirane

15-9 Predict the products of the following reactions.

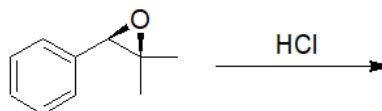


15-10 Predict the product of the following reaction. Be sure to include proper stereochemistry.

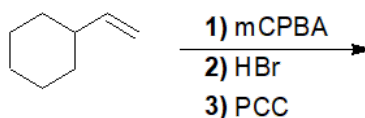


Reactions of Epoxides

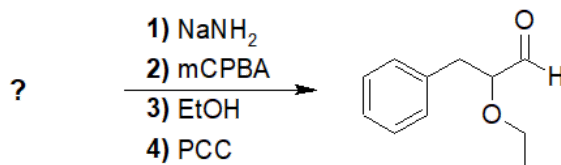
15-11 Provide the structure of the product of the following reaction. Be sure to include proper stereochemistry.



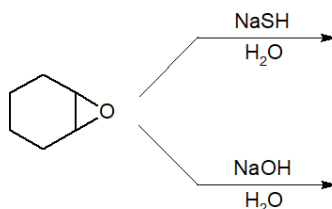
15-12 Predict the product of the following reaction.



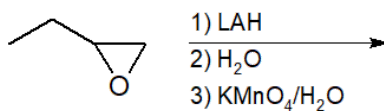
15-13 Suggest the structure of the starting brominated molecule that was used in the following reaction to make the final product.



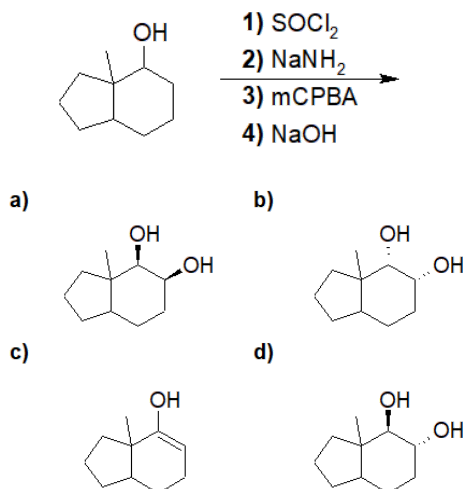
15-14 Provide the final products of the following reactions.



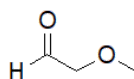
15-15 Provide the final product of the following reaction.



15-16 Choose the correct product of the following reaction.

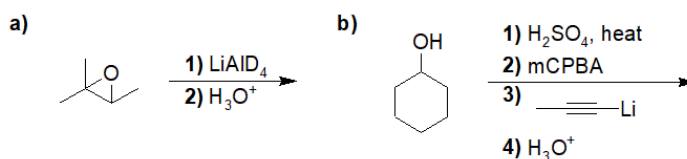


15-17 Suggest a route of synthesis (that includes an epoxide intermediate) for the following compound, starting with ethane and using any other necessary reagents.



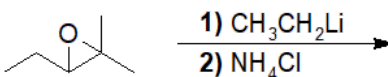
methoxyacetaldehyde

15-18 Predict the products of the following reactions. Be sure to include stereochemistry where applicable.

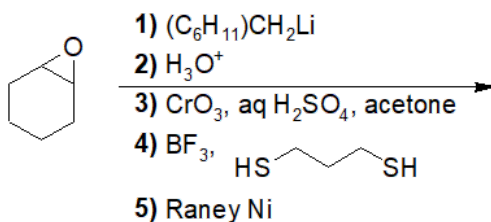


Reactions of Epoxides with Grignard and Organolithium Reagents

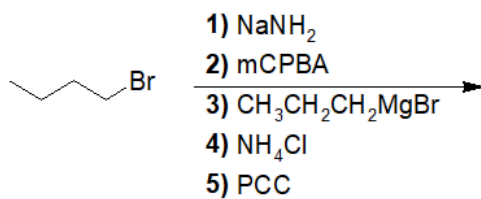
15-19 Predict the product of the following reaction and give the proper IUPAC nomenclature.



15-20 Predict the product of the following reaction.



15-21 Choose the correct IUPAC nomenclature of a product of the following reaction.



- a) heptan-4-one
- b) heptan-3-one
- c) 3-aminoheptan-3-ol
- d) (3Z)-hept-3-en-3-ol

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