Organic Chemistry for Life Sciences: CHM 224

Problem Set Chapter 14 *and* Organometallics

Name_____

DUE: Friday February 23rd

1. Rank the following compounds in decreasing order of boiling points (highest to lowest).

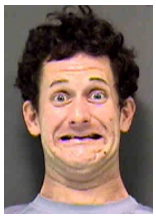
$CH_3CH_2CH_2CH_2OH$ I $CH_3CH_2OCH_2CH_3$ II CH_3OCH_3 III $HOCH_2CH_2CH_2OH$ IV

A) II>IV>I>III
B) I>IV>II>III
C) IV>I>II>III
D) III>II>I>IV
E) IV>II>I>III

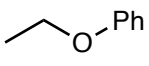
2. Ethers are subject to reaction with atmospheric O_2 to form potentially explosive peroxides. However, tert-butyl phenyl ether does not form a peroxide with O_2. This is likely because:

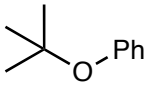
A. tert-butyl phenyl ether cannot be synthesized
B. the peroxide formed from tert-butyl phenyl ether is especially unstable
C. O_2 cannot react with tert-butyl phenyl ether to form a peroxide
D. tert-butyl phenyl ether is not a strong enough nucleophile

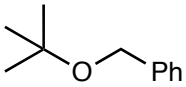
3. Jimmy says he can make all of the compounds below using the Williamson ether synthesis. Do you agree with Jimmy? If not, which can and cannot be made via this method?



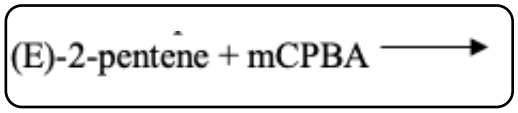
Jimmy

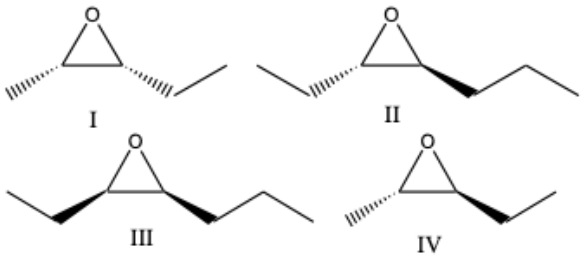




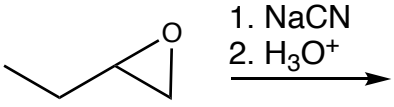


4. Predict the product for the following reaction:

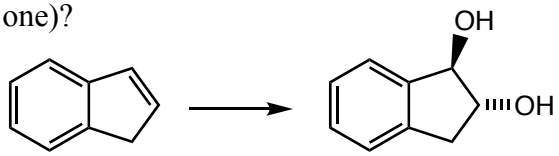




5. Predict the major product from the following reaction of an epoxide with NaCN:



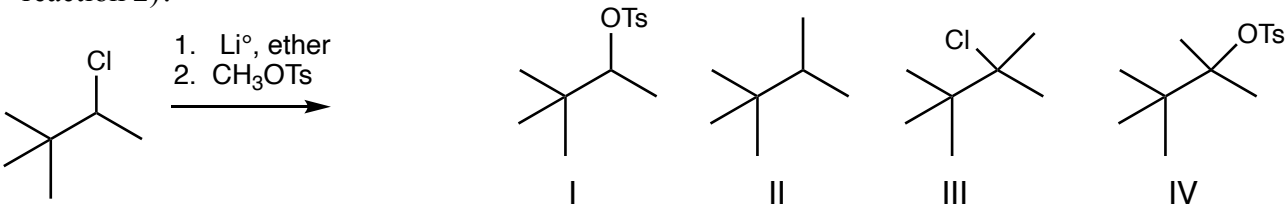
6. Which set of reaction conditions will successfully complete the transformation below (may be more than one)?



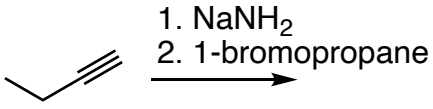
A. i) BH_3•THF ii) NaOH, H_2O_2
B. i) $Hg(OAc)_2$, H_2O ii) $NaBH_4$
C. i) $KMnO_4$, NaOH, H_2O
D. i) mCPBA ii) NaOH iii) H_3O^+

7. Predict the products for the following sequence of reactions (include proper stereochemistry):

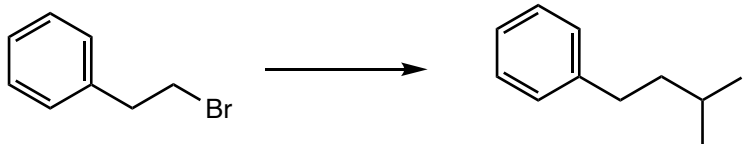
8. What is the final product expected from the following sequence of reactions (i.e., do reaction 1 and then reaction 2)?

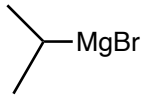


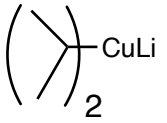
9. What is the final product expected from the following sequence of reactions

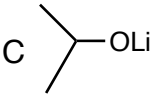


10. Which of the following organometallics will sucessfully complete the following reaction as written (may be more than one)?



A 

B 

C 

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