Ethers & Williamson Ether Synthesis

STUDENT PRACTICE WORKSHEET

Name: _____ Date: _____

Instructions: Select the best answer for questions 1–8 and briefly justify your choice using substrate, reagents, or reaction conditions. For 9–10, explain your reasoning in complete sentences.

1. Williamson ether formation is normally which mechanism?

A. SN1 B. SN2 C. E1 D. Radical substitution

Reasoning: _____

2. Most suitable electrophile with sodium phenoxide?

A. Bromomethane B. tert-Butyl bromide C. 2-Bromo-2-methylpropane D. Neopentyl bromide

Reasoning: _____

3. Sodium methoxide + 1-bromopropane mainly gives:

A. 1-Methoxypropane B. 2-Methoxypropane C. Propanone D. Propene exclusively

Reasoning: _____

4. Using a tertiary bromide and a strong alkoxide usually favors:

A. SN2 ether formation B. E2 elimination C. Aromatic substitution D. Hydrogenation

Reasoning: _____

5. Which part is the SN2 nucleophile?

A. Alkoxide anion B. Alkyl bromide C. Bromide ion before reaction D. Water exclusively

Reasoning: _____

6. The bond created in a Williamson reaction is:

A. C–O B. C=O C. O–O D. C≡C

Reasoning: _____

7. A useful way to prepare an alkoxide from an alcohol is:

A. Appropriate strong base such as NaH B. PCC C. H_2/Pd D. HBr only

Reasoning: _____

8. For ethyl tert-butyl ether, the better electrophile is:

A. Ethyl halide B. tert-Butyl halide C. Both equally ideal D. Neither can form any ether

Reasoning: _____

9. **Propose a Williamson route to methoxyethane using sodium ethoxide.**

10. **Why is tert-butyl bromide a poor electrophile for this process?**