Chemistry 220
Chapter 11 Review

1. Draw the products of the above alcohols with:
   A. PCC  
   B. Na₂Cr₂O₇/H₂SO₄  
   C. 1. TsCl/pyridine 2. NaI  
   D. HBr  
   E. HCl/ZnCl₂  
   F. PBr₃  

2. Draw the products of the above alcohols with:
   G. PCl₃  
   H. P/I₂  
   I. SOCl₂  
   J. H₂SO₄ (180°C)  
   K. 1. NaH 2. CH₃Br

5. Write a mechanism to account for the following reaction. Show each step clearly using curved arrows to show the movement of electrons.

6. Write a mechanism to account for the following reaction. Show each step clearly using curved arrows to show the movement of electrons.

7. Write a mechanism for the following reaction. Show each step clearly using curved arrows to show the movement of electrons. (Hint: Intramolecular reaction)
8. Suggest a short sequence of reactions to carry out the following synthesis.

![Chemical Structure]

9. Suggest a sequence of reactions to carry out the following synthesis.

![Chemical Structure]

10. Suggest a sequence of reactions to carry out the following synthesis.

![Chemical Structure]

11. Suggest sequence of reactions to carry out the following synthesis.

![Chemical Structure]

12. Suggest sequence of reactions to carry out the following synthesis.

Starting with only cyclopentanol and methanol

![Chemical Structure]

13. Suggest sequence of reactions to carry out the following synthesis.

Starting with only cyclopentanol and methanol

![Chemical Structure]
### 14. Tosylate Reactions

<table>
<thead>
<tr>
<th></th>
<th>Structure</th>
<th>Reaction</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td><img src="image" alt="Structure A" /></td>
<td>[TsCl → CH₃O⁻]</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td><img src="image" alt="Structure B" /></td>
<td>[TsCl → NaI]</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td><img src="image" alt="Structure C" /></td>
<td>[TsCl → CH₃O⁻]</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td><img src="image" alt="Structure D" /></td>
<td>[TsCl → CH₃O⁻]</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td><img src="image" alt="Structure E" /></td>
<td>[TsCl → tBuO⁻]</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td><img src="image" alt="Structure F" /></td>
<td>[TsCl → CH₃OH]</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td><img src="image" alt="Structure G" /></td>
<td>[TsCl → NaI]</td>
<td></td>
</tr>
</tbody>
</table>