CHEM 109 Discussion Worksheet 2

Each of the reactions below can be found in the Mechanisms app under the "Essentials" section. Work on each reaction on paper first: **draw the curved arrow notation (resonance or mechanism)**. Think more about *how and why the electrons move they way that they do* and less about how to predict products. Include lone pair and circled formal charges where appropriate. Work through the puzzle in the Mechanisms app then adjust your written response to correlate to the correct arrows and products. Keep in mind that there may be several correct ways to draw the mechanism on paper. If your original response is inconsistent with the app, bring this up in the discussion to see if your response is acceptable.

Part 1. Resonance – Mechanisms app > Essentials > Structure

Discover and draw additional resonance structure(s). Discuss which structures are more / less stable.

1. Structure #1

3. Structure #4

2. Structure #2

5. Structure #6

OH



Part 2. Nucleophilic Addition to Carbonyls – *Mechanisms app > Essentials > Carbonyl*

Propose a mechanism for each reaction.

6. Carbonyl #3 – Hemiacetal Formation





7. Carbonyl #4 – Imine Formation





Worksheet 2, Part 3. Nucleophilic Acyl Substitution (NAS) – Mechanisms app > Essentials > Carbonyl Reactions

Propose a mechanism for each reaction.

8. Carbonyl #7 – Ester Hydrolysis





9. Carbonyl #8 – Fischer Esterification



Part 4. Aldol Condensation – *Mechanisms app > Essentials > Carbonyl*

Propose a mechanism for each reaction.

10. Carbonyl #9 – Enol Formation (aldol prep)





11. Carbonyl #10 – Aldol Condensation





