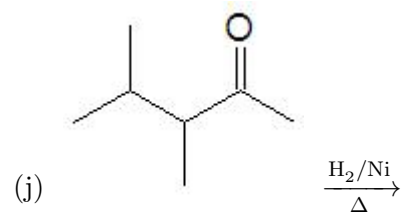
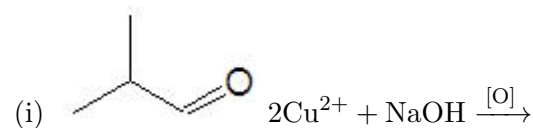
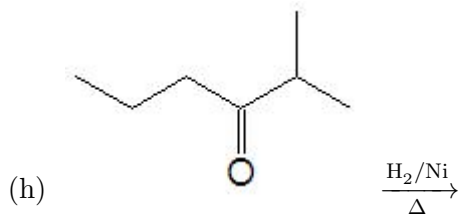
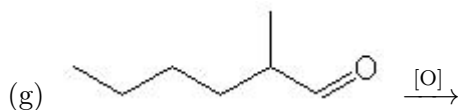
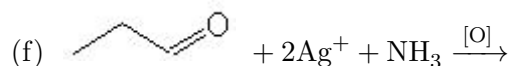
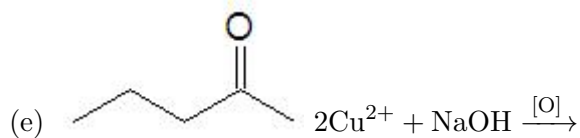
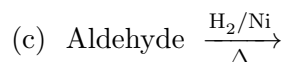


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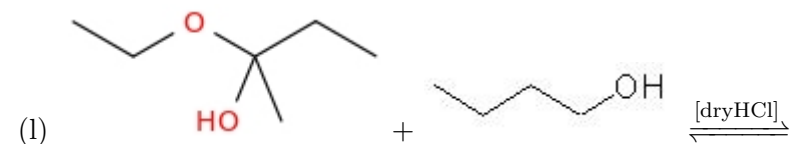
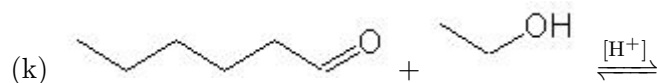
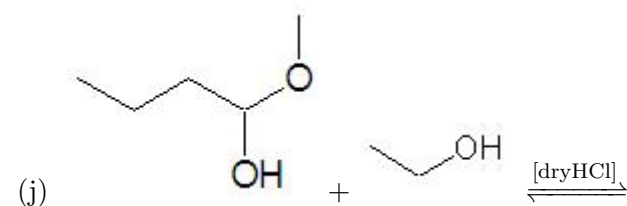
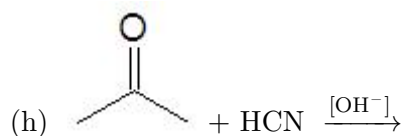
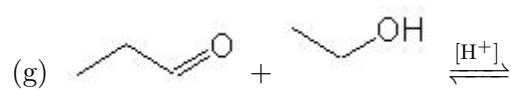
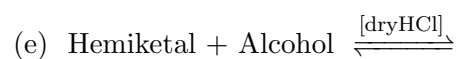
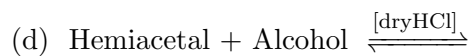
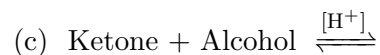
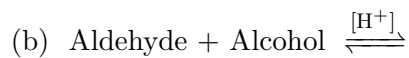
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[20 pt] 1. Complete the following reactions by filling in the missing reactants or products. You should answer each part in the format the reaction is presented in. If "No Reaction" occurs write NR in space. Provide *only* the major organic products.



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[20 pt] 2. Complete the following reactions by filling in the missing reactants or products. You should answer each part in the format the reaction is presented in. If "No Reaction" occurs write NR in space. Provide \*only\* the major organic products.



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[5 pt] 3. For each of the following named reactions, (1) tell what types of molecules it differentiates between, (2) what is the visual evidence of a positive result and (3) write a reaction illustrating a positive result.

(a) Benedicts Solution:

(b) Tollens Solution:

[4 pt] 4. (1) Define the term  $\alpha$ -hydrogen?  
(2) Include a sketch and label a molecule showing an  $\alpha$ -hydrogen.  
(3) Why are  $\alpha$ -hydrogens important?  
(4) Also include in your sketch and label a  $\beta$ -hydroxy.

[6 pt] 5. What chemical test/reaction, could I use to tell apart the following chemicals? Which molecule gives a positive result? What is the visual evidence of a positive result? Draw the structures to help you determine an appropriate method.

(a) propanal and propanone

(b) propane and propene

(c) 2-phenyl-1-ethanol and 1-phenyl-1-ethanol

6. Challenge Question: Write the structure **AND** name for each aldol condensation product that is possible when a mixture of ethanal and propanal is reacted with dilute NaOH.