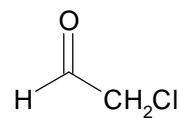
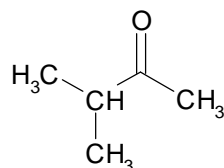
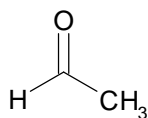
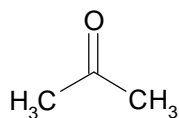
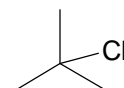
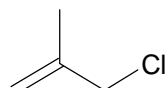
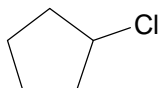
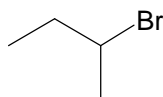


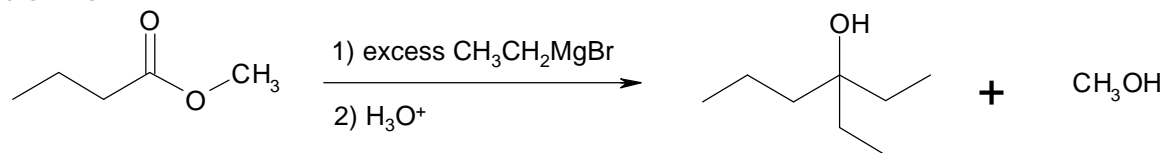
1. (10) Rank the following molecules from the most reactive (1) to least reactive (4) toward a nucleophilic reaction with methanol (to form the acetal). Explain. If sketches and/or pictures help, use them, but be sure to explain in words.



2. (10) Rank the following molecules from the most reactive (1) to least reactive (4) toward a nucleophilic reaction with methanol. Explain. If sketches and/or pictures help, use them, but be sure to explain in words.

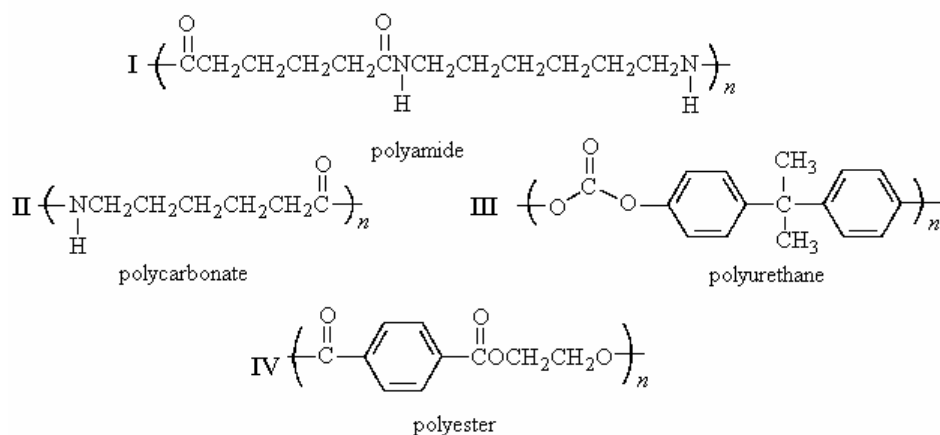


3. (10) Draw a reasonable mechanism for the following reaction, using curved arrows to represent electron flow.



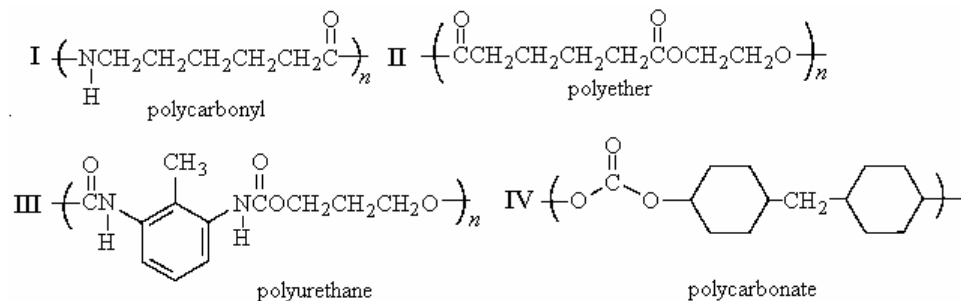
4. (3) Which polymers below are correctly classified?

a) II, III      b) III, IV      c) I, IV      d) I, II      e) I, III, IV

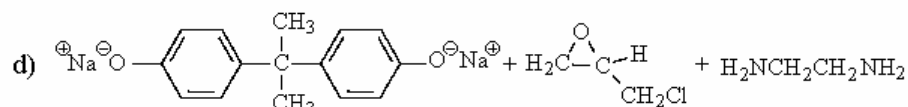
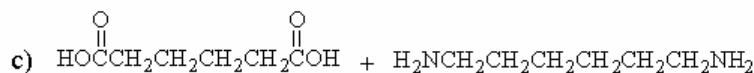
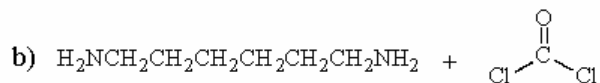
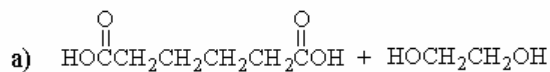
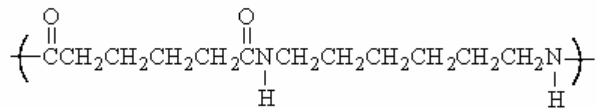


5. (3) Which polymers below are correctly classified?

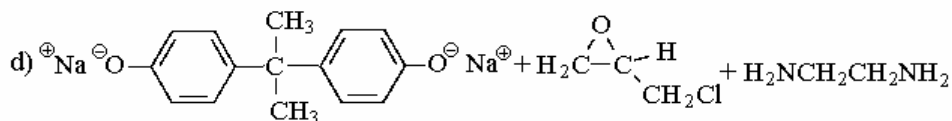
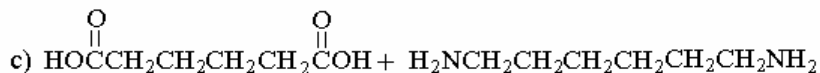
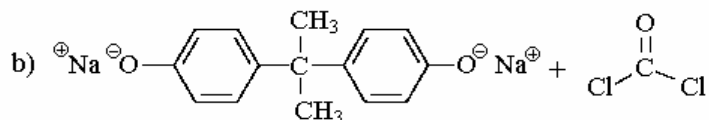
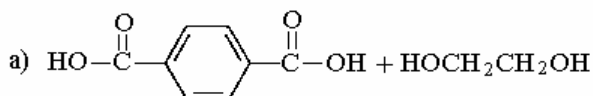
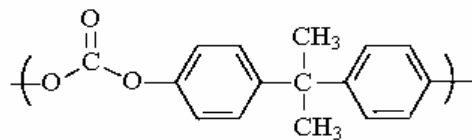
a) I, III      b) II, III      c) III, IV      d) II, IV      e) I, IV



6. (3) Which pair of compounds would react to form the polymer shown?



7. (3) Which pair of compounds would react to form the polymer shown?



8. (3) Which classification best describes the mechanism of step-growth (condensation) polymerization?

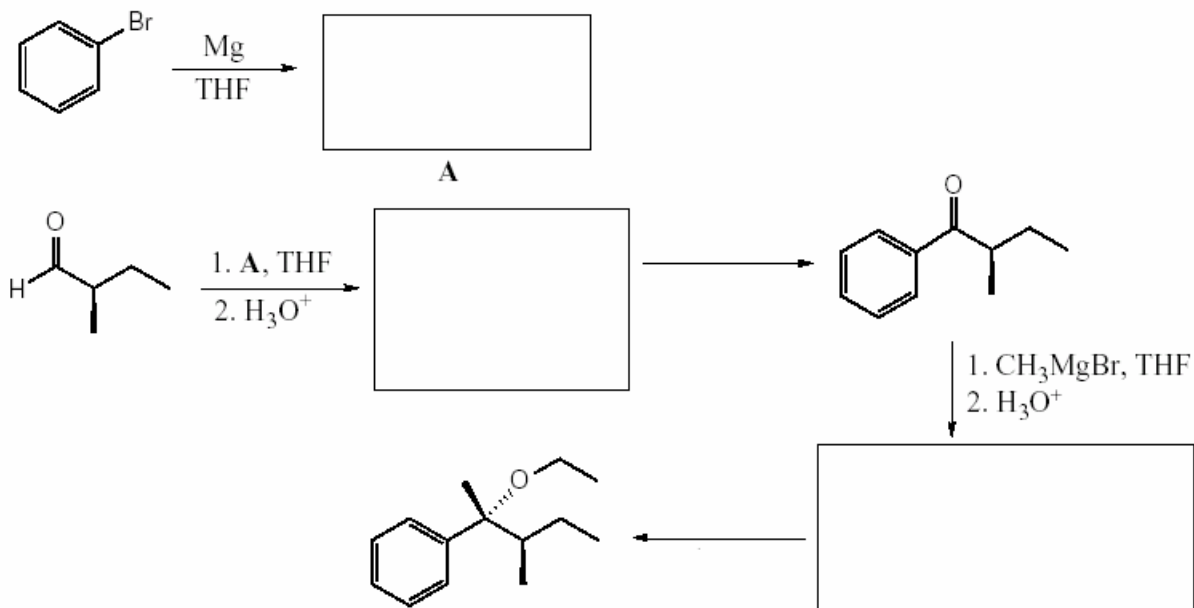
- a) nucleophilic acyl addition
- b) nucleophilic acyl substitution
- c) electrophilic addition
- d) radical substitution

9. (3) Which polymers are step-growth (condensation) polymers?

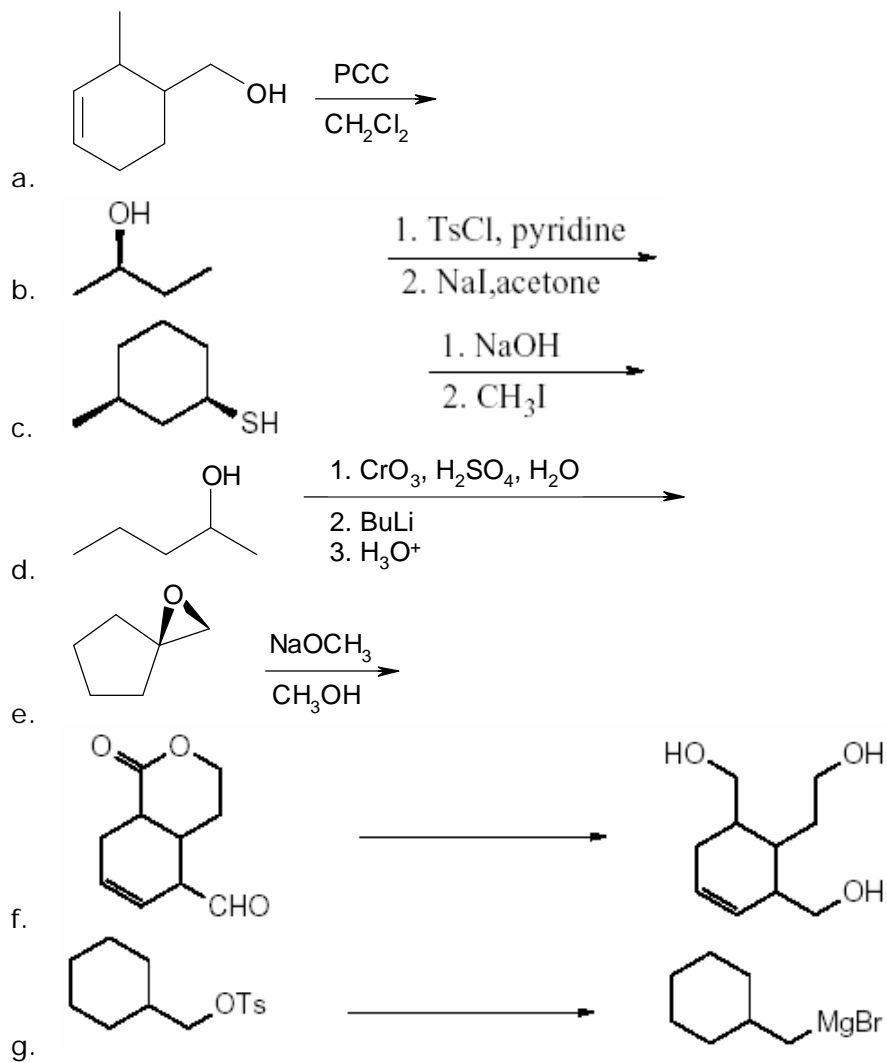
- I. nylon
- II. HDPE (high density polyethylene)
- III. Teflon (polytetrafluoroethylene)
- IV. PET (polyethyleneterephthalate)

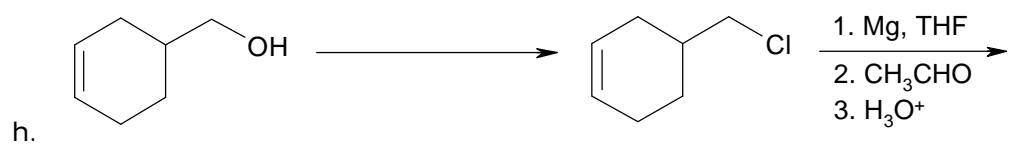
- a) I, II      b) II, III      c) I, IV      d) III, IV      e) II, IV

10. (15) Road Map. Fill in the reaction products in the boxes and add reagents over/under the arrows to complete the road map below.



11. (36) Complete the reactions by filling in the products or reagents needed. Write NR if no reaction. Don't forget stereochemistry

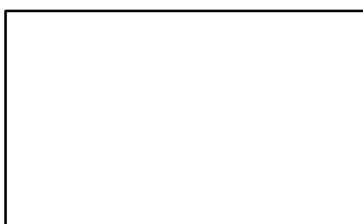




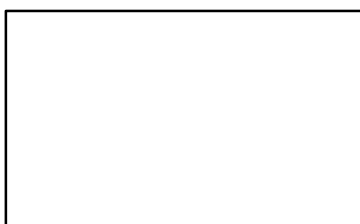
12. (10) Give the name or structure. Don't forget stereochemistry.



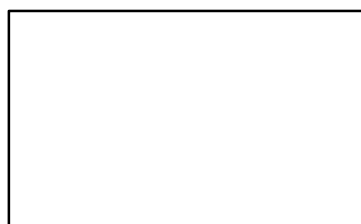
c. benzylmagnesium bromide



d. ethyl acetate



e. 2-methylpropanoyl chloride



13. Bonus take-home problem. (Do not do this in class!) Show how the the conversion below could be accomplished. Multiple steps, probably including protection/deprotection, will be needed.

