

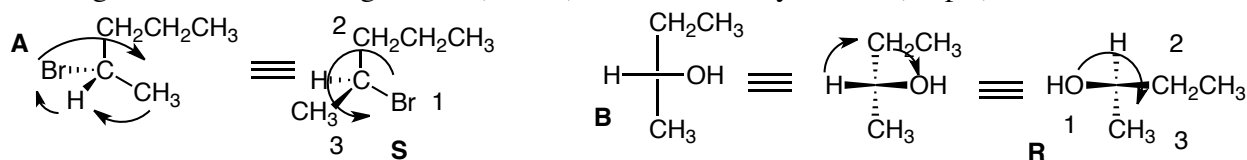
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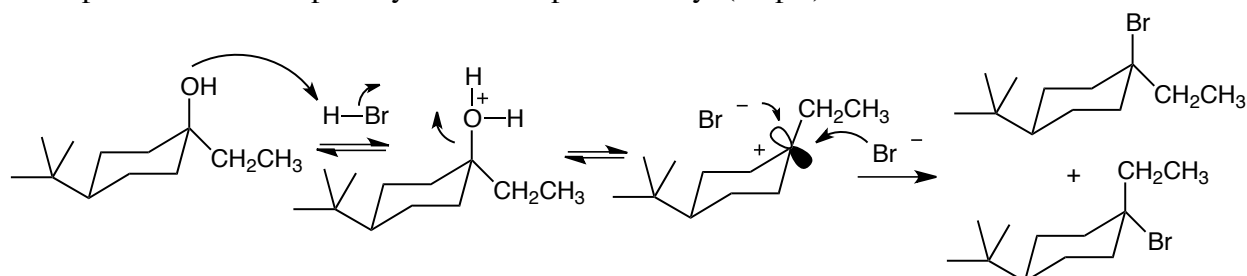
Chem. 121, Sect 009, Quiz 3

Fall, 2012, 50 points

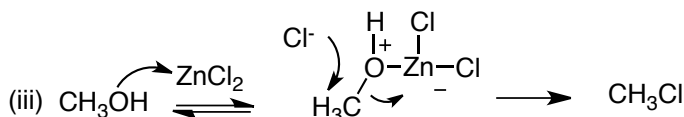
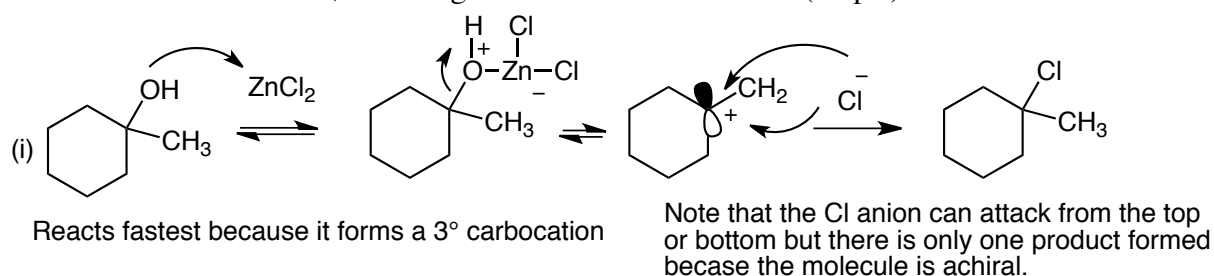
1. Assign the absolute configuration (R or S) to each chirality center. (10 pts)



2. Give the product(s) of the following reaction and show the complete reaction mechanism. (b) Is the product mixture optically active. Explain briefly. (12 pts)



3. In the Lucas Test for alcohols using HCl and ZnCl₂ as a Lewis Acid, which alcohol would (a) react fastest? (b) Which alcohol would react slowest? Explain briefly in each case and show the reaction that would occur, including the reaction mechanism. (10 pts)

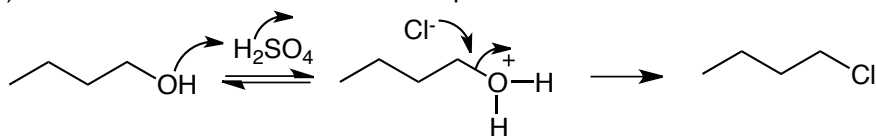


Reacts the slowest because it must react by an S_N2 mechanism, since a methyl carbocation would be very high in energy.

4. In the preparation of 1-bromobutane from 1-butanol using sodium bromide and aqueous 65% sulfuric acid, one student made a mistake and used sodium chloride instead of sodium bromide.

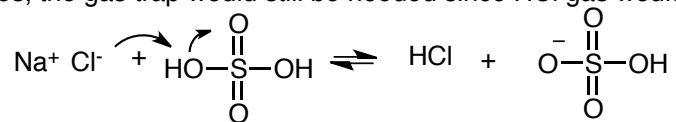
(a) Would the reaction still work? Why/why not? Explain briefly and show any reaction that would occur, giving a reasonable reaction mechanism and showing the product. (b) Would the student still need to use the gas trap (the rubber hose connected to the top of the condensing column and to a funnel submerged in a beaker of water). Why/why not? Explain briefly (10 pts)

(a) The reaction would still work but the product would be 1-chlorobutane rather than 1-bromobutane.



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(b) Yes, the gas trap would still be needed since HCl gas would be released into the lab. This is harmful.



5. In the oxidation of cyclohexanol to cyclohexanone using sodium hypochlorite (NaOCl) (a) show the overall reaction (No mechanism required). (b) Indicate what atom was oxidized. (8 pts) BONUS: Which atom was reduced? (2 pts)



(b) The carbon atom was oxidized and the chlorine atom was reduced. It gains two electrons.

