

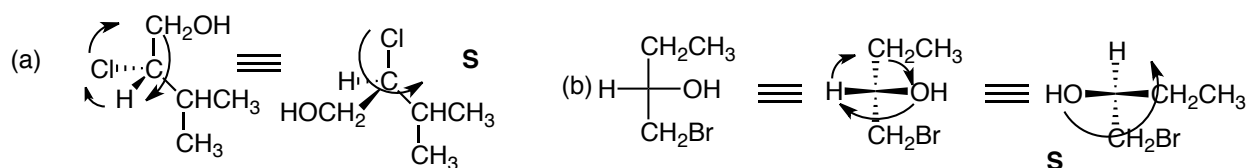
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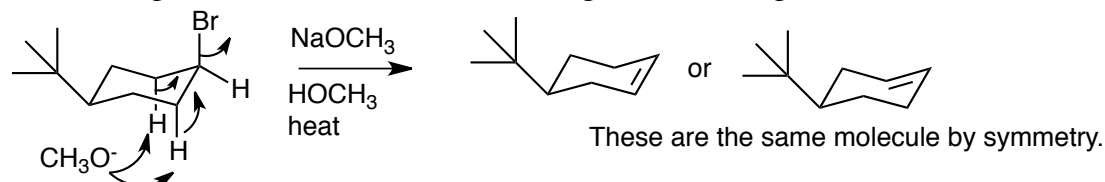
Chem. 121, Sect 010, Quiz 3

Fall, 2012, 50 points

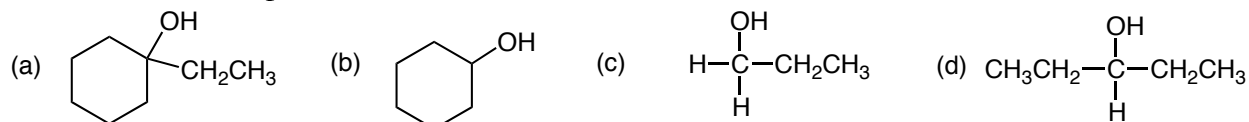
1. Assign the absolute configuration (R or S) to each of the chirality centers in the following molecules. (10 pts)



2. Give the product(s) formed in the following reaction. (10 pts)



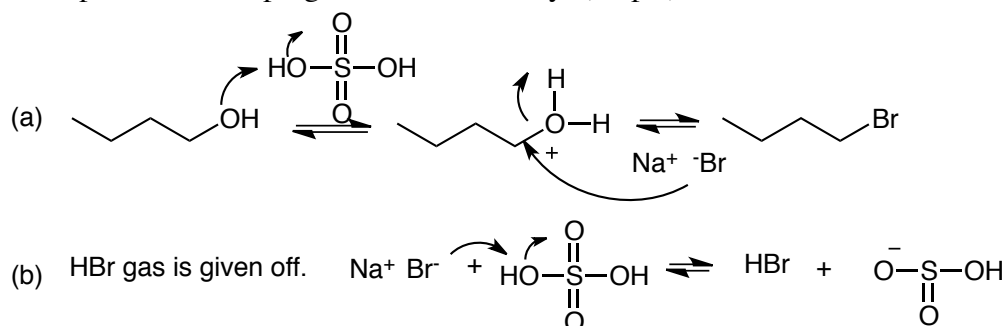
3. For the following molecules indicate which would (a) give a positive test with chromic acid ( $\text{H}_2\text{CrO}_4$ )? (b) React the fastest with  $\text{ZnCl}_2/\text{HCl}$  (Lucas Test). There may be more than one correct answer. (10 pts)



(a) **b, c, d** would all give a positive test with chromic acid.

(b) **a** reacts fastest with  $\text{ZnCl}_2/\text{HCl}$  because it is tertiary and forms the most stable carbocation.

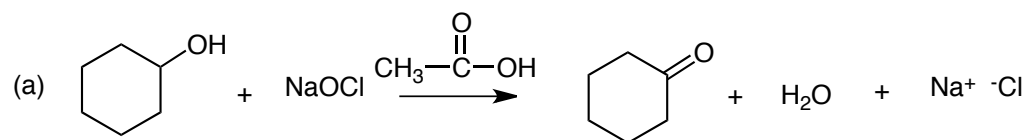
4. In the preparation of 1-bromobutane from 1-butanol, aqueous sulfuric acid and sodium bromide (a) show the complete reaction and the complete reaction mechanism. (b) What dangerous gas was given off? Show the reaction by which it was formed and briefly explain how we kept it from escaping into the laboratory. (10 pts)



We used a gas trap, a piece of rubber tubing connected to our long-stemmed funnel submerged in a beaker of water.

5. In the preparation of cyclohexanone from cyclohexanol using sodium hypochlorite ( $\text{NaOCl}$ , household bleach) and acetic acid ( $\text{CH}_3\text{CO}_2\text{H}$ ) (a) show the overall reaction (no mechanism required). (b) Explain briefly how we separated the product from the initial reaction mixture. (c) Explain the purpose of adding methylene chloride ( $\text{CH}_2\text{Cl}_2$ ) to the water layer during the work-up? (10 pts)

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(b) We separated the product from the reaction mixture by doing a steam distillation.

(c) The methylene chloride, CH<sub>2</sub>Cl<sub>2</sub>, was used for liquid-liquid extraction. The cyclohexanone has some solubility in water but is much more soluble in CH<sub>2</sub>Cl<sub>2</sub>, so shaking the aqueous layer vigorously with the CH<sub>2</sub>Cl<sub>2</sub> for several minutes will cause the cyclohexanone to move from the water layer to the organic layer.