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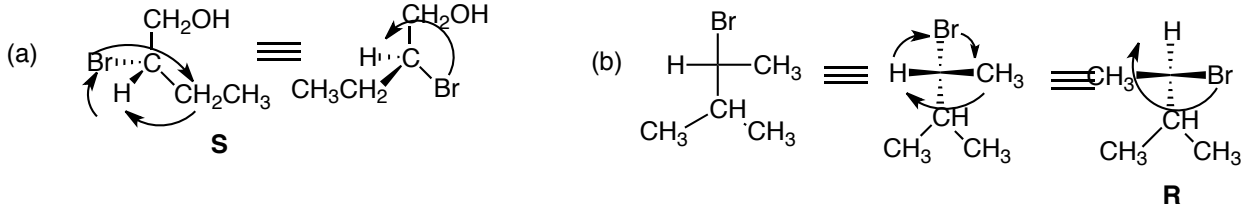
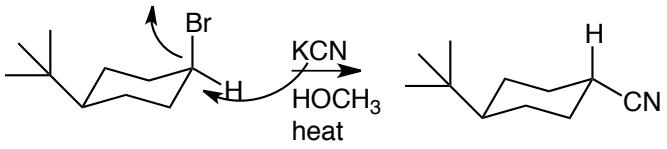
L. I. U.

Chem. 121, Sect 012, Quiz 3 Fall, 2012, 50 points

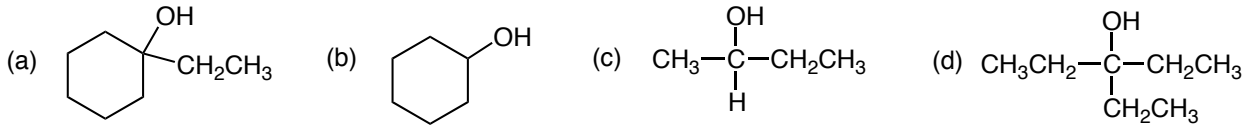
1. Assign the absolute configuration (R or S) to each of the chirality centers in the following molecules. (10 pts)



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

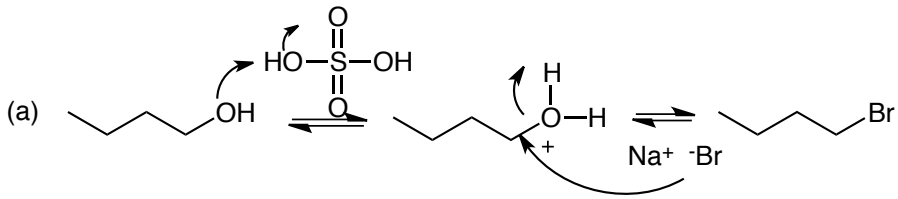


3. For the following molecules indicate which would give a positive test with (a) potassium permanganate (b) KI/I_2 (iodoform test). There may be more than one correct answer. (10 pts)



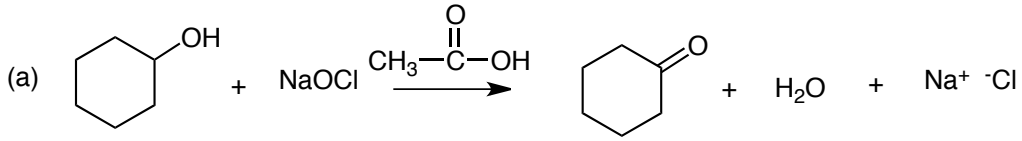
(a) **b** and **c** will react with $KMnO_4$ to give ketones. (b) Only **c** will give a positive test with iodoform since it is a secondary methyl ketone.

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) Explain the purpose of the gas-trap? (c) In the work-up, why did we wash the organic layer once with 80% sulfuric acid? (10 pts)



(b) the gas trap was there to trap any HBr that may have formed. (c) We washed with 80% sulfulric acid in order to remove any unreacted 1-butanol starting material.

5. In the preparation of cyclohexanone from cyclohexanol using sodium hypochlorite (NaOCl, household bleach) and acetic acid (CH_3CO_2H) (a) show the overall reaction (no mechanism required). (b) In the work-up we added sodium bicarbonate (Na_2CO_3) to the initial distillate. Why did we do this? Show any reaction that may have occurred. (c) Why did we add the methylene chloride (CH_2Cl_2)? Explain briefly. (10 pts)



(b) We added solid sodium carbonate to the initial distillate in order to neutralize any acetic acid that had distilled over.

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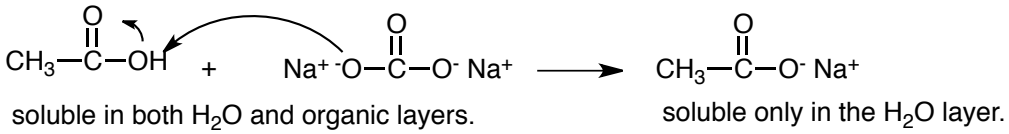

(c) The CH_2Cl_2 was used to extract any cyclohexanone from the water layer into the organic layer where it is more soluble.