

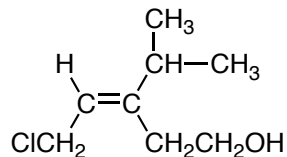
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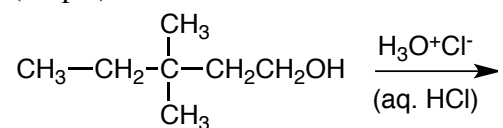
Chem. 121, Sect 009, Quiz 2

Fall, 2012, 50 points

1. (a) Name the following molecule, indicating E- or Z-configuration as well as giving the full name. (b) Draw (Z)-2-bromo-3-chloro-2-pentene. (10 pts)



2. Give the product of the following reaction and show the full mechanism by which it is formed. (10 pts)



3. In the preparation of *t*-butyl chloride (M.W. 92.57 g/mol) from *t*-butanol (M.W. 74.12 g/mol, density = 0.775 g/mL) and concentrated aqueous hydrochloric acid, explain the purpose of (a) venting the separatory funnel (b) adding the 5% sodium bicarbonate ($\text{Na}^+ \text{HCO}_2^-$). (Show any reaction that may have occurred.) (c) Adding the calcium chloride. (d) If a student isolated 6.3 g of *t*-butyl chloride, what was her percent yield? (12 pts)

4. In the Fractional Distillation experiment, (a) if we have a mixture of methanol (b.p. 64.7) and 1-butanol (b.p. 118), explain why a simple distillation does not completely separate the two compounds. (b) Could we separate the two compounds using a separatory funnel? Why/why not? (c) Briefly explain the purpose of putting copper wool in the fractionating column. (6 pts)

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5. In the preparation of cyclohexene from cyclohexanol using a catalytic amount of sulfuric acid (H_2SO_4) (a) show the reaction that occurred, including the complete reaction mechanism. (b) One student could not find the concentrated sulfuric acid, so he decided to use concentrated aqueous hydrochloric acid instead. To be sure he was using enough of the acid, he used one full equivalent. Was this a good idea? Explain and show any reaction(s) that may have occurred. (12 pts)