

This Prelab is due at 1pm on Thursday, Nov 8, for the T/R section, or Friday, Nov 9, for the W/F section. Please read the section on the elimination of alcohols to make alkenes in your organic chemistry textbook and the rest of experiment II in your lab manual. This prelab has two pages.

1. (1 pt) What is the **name (a)** and **structural formula (b)** for the organic molecule that you will use to catalyze the conversion of the alcohol to the corresponding isomeric alkenes mixture?

a.

b.

2. (2 pts) Give the boiling point for the following four compounds.

a. 2,3-dimethyl-1-butene \_\_\_\_\_

b. 2,3-dimethyl-2-butene \_\_\_\_\_

c. diethyl ether \_\_\_\_\_

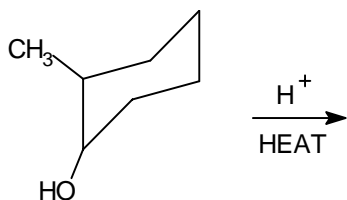
d. 2,3-dimethyl-2-butanol \_\_\_\_\_

3. (2 pt) (Hint: see page 16 of the lab manual.)

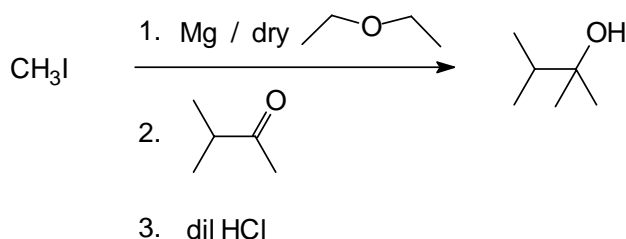
a. If the spinning band column is 1 meter in length, how many theoretical plates will it have?

b. Would you expect to be able to use this column to separate the 2,3-dimethyl-2-butene from 2,3-dimethyl-2-butanol to better than 95% purity? Briefly explain why or why not and show calculations to prove this.

4. (2 pts) Give all possible products for the following E1 elimination reaction. (Hint: there is more than one product possible.)



5. (3 pts) The following is the Grignard reaction that you performed in lab:

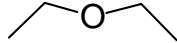
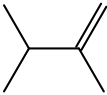
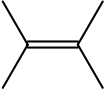
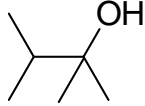


Answer the following questions given that you start with 43.0 g of methyl iodide (MW 139.9), 11.0 g of magnesium turnings (AW 24.3) and 29.0 g of 3-methyl-2-butanone (MW 86.1).

a. What is the limiting reagent? Show your work.

b. What is the theoretical yield for 2,3-dimethyl-2-butanol in grams? Show your work. The MW of the alcohol is 102.2.

c. The mass of the combined alcohol fractions after fractional distillation was determined to be 29.4 g. The GC analysis of the combined fractions gave the following percentage of each component by weight:

			
0.1%	12.1%	3.7%	84.1%

What is the mass in grams of only the alcohol in the combined fractions? Show your work.