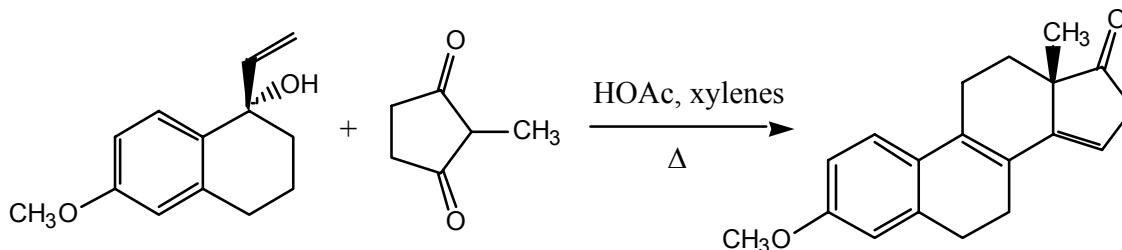


## STEP 2:

### 3-METHOXY-1,3,5(10),8(9),14(15)-ESTRAPENTAENE-17-ONE



#### 1. Procedure

*You will do this step **TWO** times, the first time on a small scale using ~250 mg of material. After learning which spot is your product from NMR analysis of various fractions isolated during column chromatography of the product mixture from the small-scale reaction, you will bring the rest of your material through in the second reaction.*

Dissolve the crude 1-hydroxy-1-vinyl-6-methoxy tetralin (1.00 equiv) prepared in the previous experiment in xylenes (sol'n ~ 0.80 M) in a three-necked round-bottomed flask equipped with a reflux condenser in the center neck, a magnetic stirbar, and two rubber septa (Figure 2). Add 2-methyl-1,3-cyclopentanone (1.01 equiv) and glacial acetic acid (10 equiv) to the reaction solution (note 1). Flush the apparatus with nitrogen, then affix a septum and a nitrogen balloon to the top of the reflux condenser. Heat the reaction mixture to reflux using an oil bath or a heating mantle as a heat source (note 2). Monitor the progress of the reaction using thin layer chromatography.

After two hours, allow the reaction mixture to cool to room temperature. Evaporate the solvent to dryness on the high vacuum line with stirring (Use a dry ice- or liquid nitrogen-cooled solvent trap between the vacuum line and the reaction solution, note 3). Add toluene and ethyl ether (1:1 v/v mixture) to dissolve the solid residue. Filter the mixture through a cone of filter paper in a funnel directly into a separatory funnel. Wash the organic phase successively with a solution of saturated aqueous sodium

bicarbonate and a solution of saturated aqueous sodium chloride. Dry the organic layer with magnesium sulfate and filter. Evaporate the solvent under vacuum (Use a dry ice- or liquid nitrogen-cooled solvent trap between the vacuum line and the reaction solution, note 4). Purify the crude product by flash chromatography (~ 90:10 hexane/ethyl acetate). Recrystallize the solid from boiling hexanes, if necessary, to remove any colored impurities.

## 2. Notes

1. Glacial acetic acid is corrosive and volatile. Avoid contact with the liquid or the vapors.

2. **Never plug a heating mantle or an oil bath directly into a wall socket.** They must be connected to a Variac to regulate the voltage. Never heat an empty heating mantle. Always inspect the bottom of an oil bath for water droplets. Water in an oil bath may explosively vaporize and spray hot oil when the bath is heated near or above 100 °C.

3. Xylenes are high boiling and are not readily removed by rotary evaporation.

4. Toluene is somewhat toxic and is flammable. Care should be taken in its handling. Do not breathe the vapors. Check with the TA for appropriate disposal instructions.

## 3. Characterization and Report

Determine the yield of product, both crude and after purification.

Characterize the purified material by IR, <sup>1</sup>H and <sup>13</sup>C NMR, and melting point.

Assess the purity of the final material based on the spectral data.

Tabulate and assign the spectral data.

List TLC conditions used and the *R<sub>f</sub>* values of starting material and product.

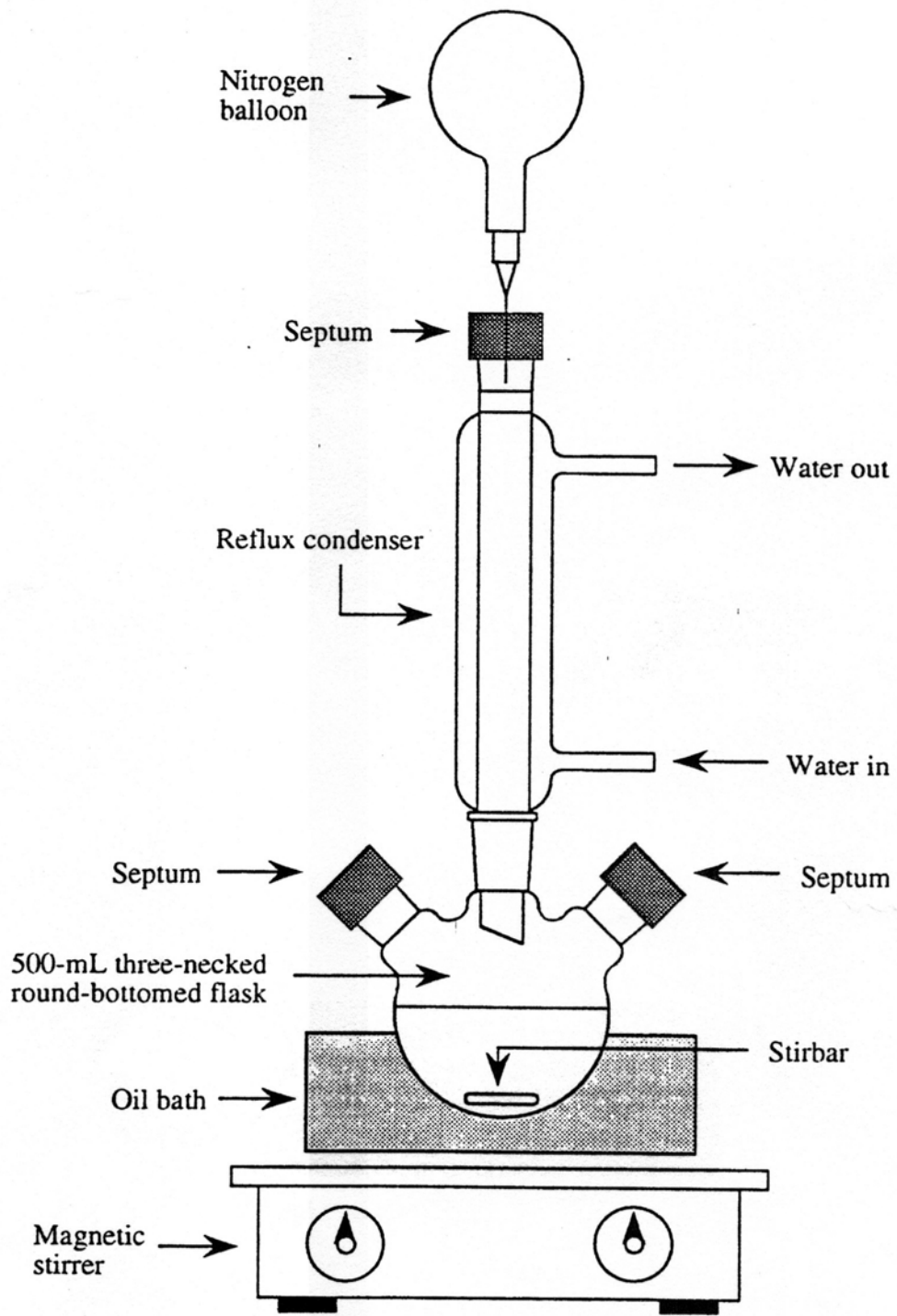


Figure 2