- $R_{\rm f}$ value of Ketone Standard $\frac{25 mm}{48 mm} = 0.52$
- Yield of Crude Product
 0.084 g
- % Yield of Crude Product $\frac{84 mg}{107 mg} \times 100 = 78.5 \% yield$

QUESTIONS:

- 1.
- a. A stereoselective reaction is a reaction that forms an unequal mixture of stereoisomers due to the creation of a new stereocenter.
- b. TLC analysis of the crude reaction mixture should yield two spots. One spot should be very intense, which correlates to the *trans* isomer of cyclohexanol. The other spot should be faint, which correlates to the *cis* isomer. The difference in intensities is related to the amount of each isomer in the crude reaction mixture; a more intense spot indicates a higher concentration and a less intense spot indicates arower concentration. The TLC data that was obtained only ballone very intense spot, which indicates that the crude reaction mixture conclusion of only the *trans* isomer.

2.

- a. 3500 3200 cm⁻¹, GH stretch, product 1750 - 1680 cm⁻¹, Ketone C=O stretch reactant
- Bescon the FTIR spectral based, the reaction was successful in reducing the ketone to an alcohol. On the FTIR spectra, there is a very strong band at 3279 cm⁻¹ which corresponds to an OH stretch. This indicates that the product, cyclohexanol, has been formed. Additionally, on the FTIR spectrum, there is no band in the 1750 1680 cm⁻¹ region, indicating that there are no ketones present in the product. By looking at these two regions and seeing the presence of an OH group and absence of a ketone, the reaction has been successful.
- 3.
- a. The provided ¹H NMR spectrum indicates the *trans* isomer of 4-*tert*-butylcyclohexanol.
- b.

