Suzuki Coupling:

Data and Calculations:

Theoretical Yield: .69g x 1/121.93g x 1/1 x 196.24g = 1.11g

Yield before recrystallization: 0.897g

Percent Yield: 0.897g / 1.11g x 100 = 80.81%

For Recrystallization: .273g/.897g x 100 = 30.43%

Discussions and Conclusions:

From the experiment, the melting point range of the product that was supposedly 4-acetylbiphenyl was 114-116 degrees C. The documented melting point is 121 degrees C. This means that there were impurities within the collected product, but small enough to attain a melting point that was close to the pure product. From the TLC plate, only one spot was seen that had and Rf of 0.15 so it can be concluded that only product was made with potentially impure substances within the spot of the TLC. Going from 80.81% yield to 30.43% yield infers that there was a lot of impurities, unreacted reactants, as the end product.

Indigo Dye:

Data and Calculations:

NONE

Discussions and Conclusions:

Cotton had darker spots than that of polyester. This is due to the structure of cotton having several alcohol groups that can create hydrogen bonding with the structure of leucoindigo than that of polyester. The spots on the cotton were more concentrated in areas rather than for polyester where it looked really scratched. The leucoindigo was used instead of indigo because indigo can hydrogen bond with itself making it insoluble in water. Leucoindigo is water soluble which allows for the molecules to attach to the fabric where when it dries, the leucoindigo oxidizes making it impossible to leave the fabric.

Sodium Borohydride:

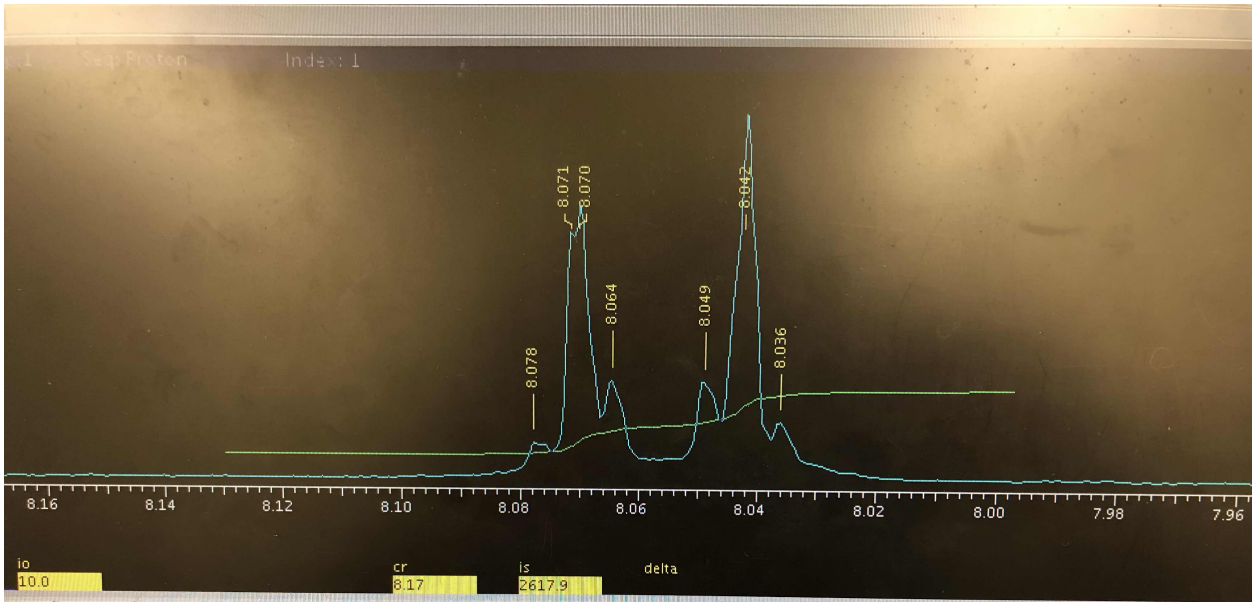
Observations and Measurements:

For the cerium mix, when the sodium borohydride was added, the mix slowly turned into a yellow color over time. For the mix without cerium, the mix turned cloudy white when the sodium borohydride. The products were clear.

Data and Calculations:

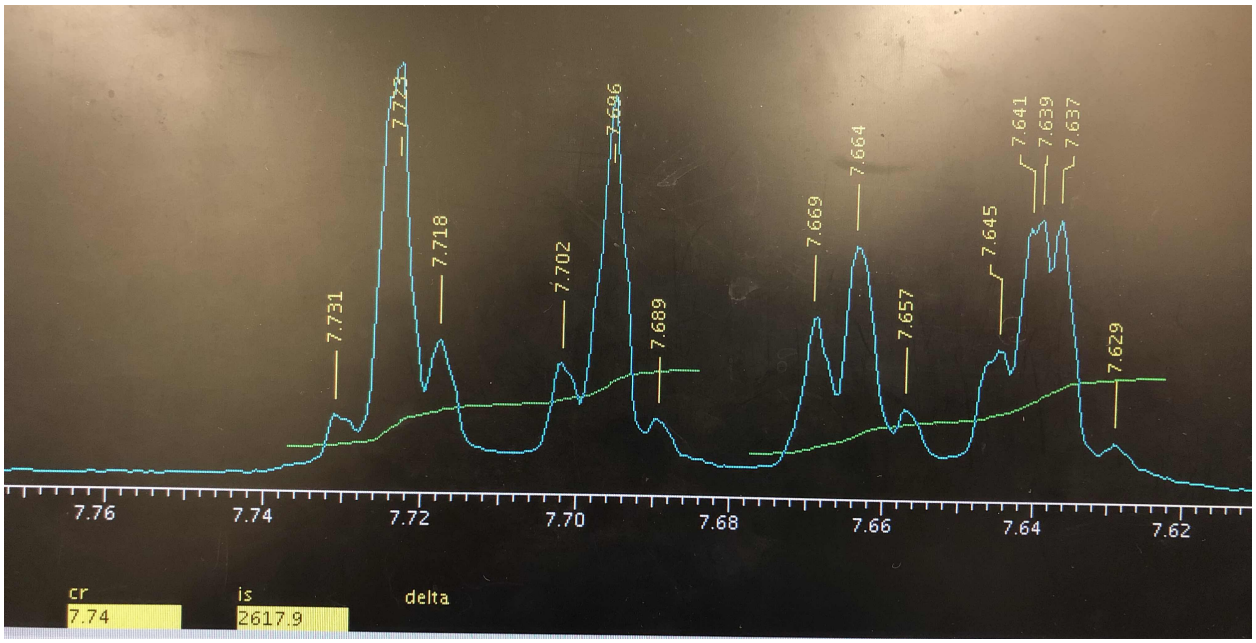
Discussions and Conclusions:

Suzuki NMR:



Smaller: 8.071 - 8.064 * 300 = 2.1Hz

Larger: 8.071 - 8.042 * 300 = 8.7Hz

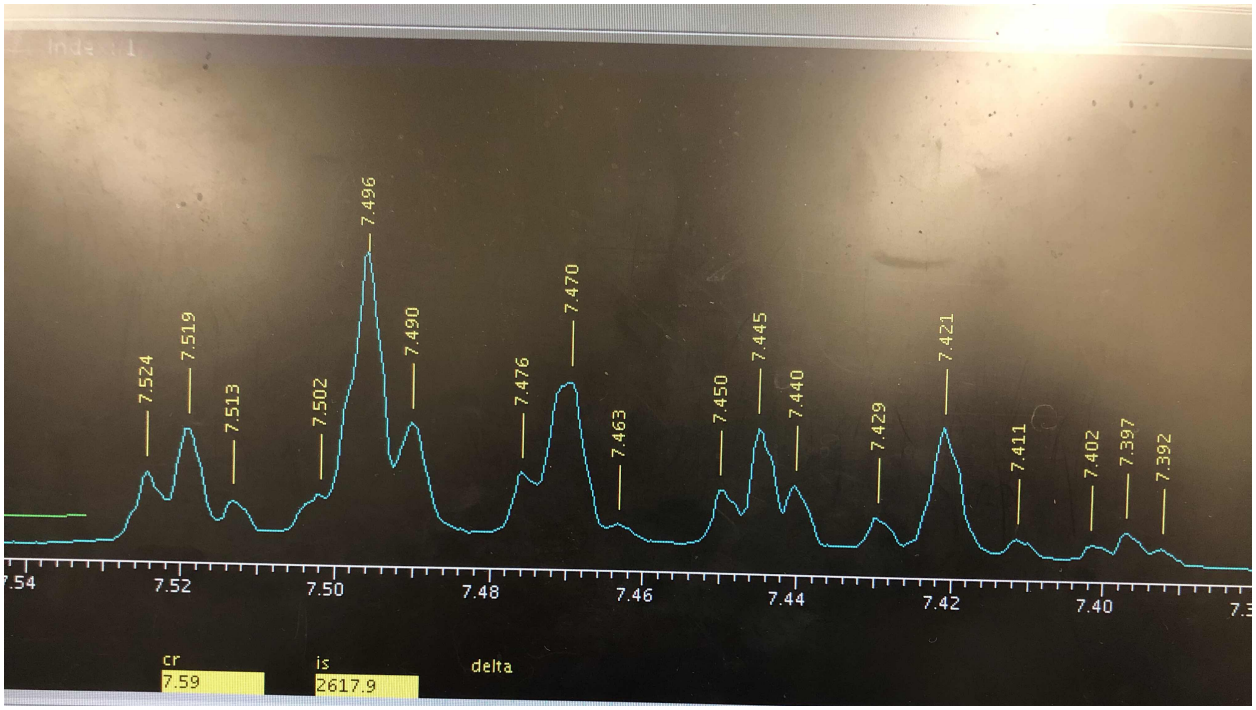


Smaller Left 2: 7.723 - 7.718 * 300 = 1.5 Hz

1 and 2: 7.723 - 7.696 * 300 = 8.1 Hz

Smaller Right two: 7.669 - 7.664 * 300 = 1.5 Hz

3 and 4: 7.664 - 7.639 * 300 = 7.5 Hz



Smaller 1 and 2: 7.524 - 7.519 * 300 = 1.5 Hz
1 and 2: 7.519 - 7.496 * 300 = 6.9 Hz
Smaller 3 and 4: 7.476 - 7.470 * 300 = 1.8 Hz
3 and 4: 7.470 - 7.445 * 300 = 7.5 Hz
Smaller 5 and 6: 7.429 - 7.421 * 300 = 2.4 Hz
5 and 6: 7.421 - 7.397 * 300 = 7.2 Hz