**CHEM 303 REPORT**

**CANNIZARO REACTION**

**Name and Surname**: Elif Nazenin Giray **Date of Experiment**:6.1.2022

**Section**:3 (Thursday)

**1.Reaction Scheme**



**2.Table of Reactants and Reagents**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Reagents/Reactants** | **Mol/mmol** | **Mwt**  **(g/mol)** | **Mass**  **(g or mg)** | **equivalence** | **Volume** | **Density** |
| Potassium hydroxide | 89.12 mmol | 56.105 g/mol | 5 g | 13 |  |  |
| Benzaldehyde | 6.88 mmol | 106.12 g/mol |  | 1 | 7mL | 1.044 g/mL |
| Hydrochloric acid (%50) | 19.7 mmol | 36,46 g/mol |  | 3 | 40 mL | 0.036g/mL |

**3.Reaction Mechanism**



**4.Procedure**

Dissolve 5g of KOH in 5ml of water in 100 ml Erlenmeyer flask and cool the solution about 20°C in ice bath then add 7ml benzaldehyde to solution.

Add the solution to separation funnel then add the 20ml distilled water finally add 15 ml ethyl acetate to funnel.

Add CaCl2 to organic phase then filter the organic phase .Remove the solvent by rotary evaporator. The mix of benzaldehyde and benzyl alcohol is obtained yellow oil.

Take the aqueous phase and organic phase from funnel. After that add the aqueous phase to funnel then add the 15ml ethyl acetate to funnel. Take the aqueous phase.

Add aqueous phase to HCl solution then put HCl into to ice bath

Prepare the 40 ml 50% HCl solution and add small ice to mixture.

Recrystallize the precipitates with water for purify.

Benzoic acids are white crystals.

Separate the crystals by suction(vacuum) filtration.

**A picture containing chart

Description automatically generated**

**Organic Phase**

We have peak at 3200-3300 that means we -OH stretching. We have peaks at 2500-3200 area that’s shows the ın our structure has the aldehyde. Area of 1000-500 we have many peaks this show we have many C-H bonds then we have sharp peaks at 1500-1700 that shows we have aldehyde substituent in organic phase. Finally, we have many sharp peaks at 1500-1800 that present the ın our organic phase we have aromatic ring.

A picture containing chart

Description automatically generated

**Aqueous Phase**

In aqueous phase we have extensive spread peak in the area of 2500-3500 this shows the carboxylic acid .We have many sharp peaks at the 1500-1800 that means the we have aromatic ring in the aqueous phase.

***The Calculation of Product (From Suzuki Experiment)***

0,00025 mmol = Product

198.22 g/mol=Molecular weight of our product

(0,00025 mmol) x (198.22 g/mol) = 0.495 product (Theoretical value)

(Filter Paper+Product)-(Filter Paper)= Experimental value (in grams)

(0.05+0.07)-(0.05)=0.07 g

(Experimental value)g x 100% = % yield

(Theoretical value)

[(0.07g)/(0.495g)]x(100%)= 14.14%