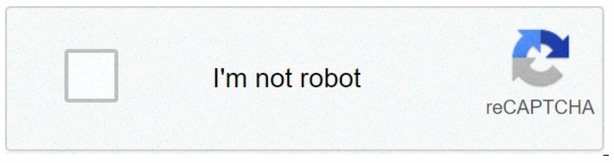

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Grignard reaction lab report conclusion

CHEM 112B – 058 2/22/13 Laboratory 6: Grignard's reaction with ketone – tri-neuememetnol discussion/conclusion/criticism of the purpose of this laboratory, to explore the reaction of Grignard reagents with ketones to form tertiary alcohol, has been achieved. The experiment was conducted simply by heating the reaction at 35 °C to 40 °C for about fifteen minutes. Grignard's reaction is to add organomagnesium halide (Grignard detector) to ketone to form tertiary alcohol, in this case, metanel triphenyl. The reaction begins with the synthesis of grignard detector, magnesium vinyl bromide, starting with brombenzene and magnesium using ether as a solvent. This Grignard reagents are then added to the benzophenone, a carbonyl compound, to form triphenyl methanol. Two responses were observed in this experiment. The laboratory experiment was successful. At the beginning of the experiment, the feather placed the magnetic spine, magnesium strips, iodine, and a small crystal of iodine in a 3 ml conical vial. A solution of bromobenzene-ether was added while the mixture in the 3 ml conical vial was used by Grignard reaction to prepare Triphenylmethanol by: Alexis Huddleston Abstract Grignard Reagents are considered organic reagents and alamanlis and therefore Lewis's strong rules and function as neocleophiles are usually good. In anaesthetist reaction conditions, the formation of Grignard reagents can occur when the detector reacts with an organic halide. As shown in the laboratory, magnesium vinyl bromide, an organic halide, can interact with methyl benzoate along with a Grignard detector to produce metanil triphenyl. Since Grignard reagents are highly reactive with Lewis-like acids, precautions have been taken during the laboratory to ensure that the reaction was not destroyed due to the presence of water (chemistry I and II, 89). Phenyl magnesium bromide has been prepared to initiate the reaction and has been added to methyl benzoate. The resulting melting point of grignard reaction allowed the purity of the product to be evaluated. In addition, the infrared peaks in the IR spectrum allowed the product to observe the functional groups of triphenylmethanol. It should be noted that the absence of water during the Grignard reaction allowed the reaction product, triphenyl methenol, to be successfully manufactured. The use of Grignard reagents to produce compounds such as triphenylmethanol has not only been found to be a useful way to assemble a variety of functional groups but also to be a versatile technique. Interestingly, in modern industry, the widespread application of Grignard reactions has decreased over time due to cost inefficiency. In addition, the potential risks of using a large amount of diethylene ether, a solvent used in this experiment, also affected the decline in industrial applications of Grignard interactions (Teixeira et al. 714-715). However, in order to explore Where magnesium and methyl benzoate bromide could interact to produce metahanol triphenyls, grignard reaction was used during this experiment. It was necessary to install a Grignard detector in order for Grignard to react to this experiment, and therefore, magnesium vinyl bromide was produced before proceeding with the preparation of metahanol triphenyls. Grignard reagents, such as bromide vinyl magnesium, are Lewis' rules and are good nucleophiles. They are also good leaving sets. Because of the increased size of the molecule when it went down the periodic table, it was clear that the bromide vinyl mathrsium was leaving good. In addition, Grignard's continued reaction in the production of the finished product was due to the fact that ketones are more reactive with neuclifyls than esters. Thus, the ketone, benzophenone, was able to utilize the Grignard detector to enhance Grignard's reaction to completion, thus producing triphenyl methanol, the final product as shown in the mechanisms below representing the chemical reactions that occurred during the experiment, and the preparation of the Grignard detector was the first step of Grignard's reaction. As shown in 'Chart 2' below, the Grignard detector was used to produce the final product, metaphenyl metaphenol (first and second organic chemistry, 90). When assembling the finished product, the melting point of the product was observed and recorded, allowing the purity of the product to be assessed. In addition, the IR spectrum of the product was obtained and analyzed for specific peaks, allowing for further evaluation of product purity. Laboratory results accurately illustrate the effects of properly utilizing grignard reaction, specifically in the production of triphenyl methane. Materials and materials methods: aluminum foil needles 1.0 ml injection spatum Bromobenzene dethyl ether methyl benzoate Microscale device 3 ml conical vials 10 ml round down vial spin van Magnesium turns spoon iodine cap crystals and hot barrier small plate ice glass water fumes distilled water hood 3 M HCl Filter Solution - Hint Sucker 5 ml conical vials 50 ml Erlenmyer vials saturated NaCl solution methods: Step 1: Before starting the experiment, wrap the glassware involved in aluminum foil and put the glassware in the oven to ensure that the glassware is dry and water-free. Step 2: Get the glassware from the oven and unscrew the aluminum foil. Step 3: Get one needle and three 1.0 mL injections. One injection of brompenzine, one for methyl benzoate, and one will be used to add ether dithyl to the reaction. The syringe used to add ether dithel will be used to interact throughout the experiment. Formation of magnesium vinyl bromide: Step 1: Assemble a microscale device for use during the preparation of vinyl magnesium bromide. Step 2: Label two clean, dry 3 vials of cone #1 and #2 flask. Before moving on to the next step, remember Summary of all reagents used in the experiment to ensure no contamination of water vapor. Step 3: In #1 flask, place 2.5 mmol bromobenzene and 1.5 ml ether dithyl and immediately seal the mixture using a lid and septum. Gently shake the mixture. Step 4: In the #2 vial, place 1.00 ml (136.1 mg, 0.1361g) methyl benzoate and 1.5 ml dithyl ether and immediately seal the mixture using a lid and septum. Gently shake the mixture. Step 5: Place in a 10ml round-bottom vial with a rotation truck, 2.1 mmol magnesium turns and 1.0 ml of ether dithyl. Step 6: Use a spoon to add a small piece of iodine crystal through the opening named Cap A on the machine. Step 7: Using a 1.0 ml syringe, add 1.0 ml of ether dithyl through the barrier of Cap A to rinse the iodine down in the vial. Step 8: Set the heat plate temperature to approximately 90°C and return the solution in a round bottom flask while stirring for about 5 minutes. Step 9: Using one of the 1.0 ml injections, transfer 4-5 drops of the reagent mixture from the #1 the vial through the barrier of Cap A. Continue to repeat for an additional 3 minutes. Step 10: Transfer the remaining contents of the #1 the vial at a circular bottom over a period of 10 minutes. Step 11: Continue to re-recoil for about 10-15 minutes or until almost all magnesium reacts and the solution turns to a clear amber color. Forming triphenylmethanol product: Step 1: For 2 minutes, use a second clean syringe to transfer all the contents of the detector from the #2 the vial through the barrier of cap A in the vial down round. Keep repeating within my minute. Step 2: Return the solution for an additional 30 minutes. Step 3: Keep the round-bottom edging and sealed flask, allowing the solution to cool at room temperature using an iced water bath. Use a small beak for an iced water bath and place a round-bottomed flask inside the beak so that it can be cooled. Step 4: Place the round flask in the smoke cover and carefully remove cap A. Step 5: In a round bottom flask, add 20 drops of distilled H2O drop. Start spinning in the solution. Continuous vortex, add drops of HCl 3M solution to the reaction. If necessary, add more ether dethel to the solution. Step 6: Monitor the evolution of H2 gas during the reaction and then remove the reaction mixture from the iced water bath. Step 7: Dismantle the microscale device. Step 8: Observe a clear biphase mixture of the organic ether dithyl layer at the top and an acidic water layer at the bottom of the reaction mixture. Insulation and product characterization - Triphenylmethanol by extraction: Step 1: Using a clean pipette tip filter, transfer the two-phase mixture from a round bottom flask to a clean and dry 5 ml conical vial. Step 2: Rinse the round bottom flask with a small amount of ether dithyl. Transfer rinsing solution from round bottom flask in 5 ml conical flask In the previous step. Step 3: Use tweezers or tweezers to remove the spin feather from the bottom round flask and place a spin feather in a 5 ml conical flask carefully, avoid excessive spraying or loss of solution. Step 4: Use micropipette to carefully remove the waterlayer from the solution and transfer it to a clean, dry 50 ml erlenmyer flask and set aside. Step 5: In the remaining organic dithel athel solution in a 5 ml conical vial, add 1-2 ml of distilled water and allow the solution to move for about 1 minute. Step 6: Use a pipette to remove the second layer of water. Repeat the rinsing process if necessary. Combine these rinses with the initial rinse inside the Erlenmyer vial 50 ml. Step 7: Add 1 ml of saturated NaCl solution to the 5ml conical vial containing the organic dithlether layer as a final rinse. Vigorously move the solution into a 5 ml conical vial and remove the water layer. Combine this rinsing with other rinsing scinused scinused scints in erlenmyer 50 ml vial. Step 8: Dry the organic dithlith ether layer with MgSO4 (magnesium sulfate). Step 9: Get a flask and hat, weigh the flask with the lid on it, and record the weight. Step 10: Get a glass pipette and pack it with a small amount of cotton and silica gel. Step 11: Use a clean pipette from the end of the filter to add organic dithlether layer and MgSO4 mixture to the glass absorbent to be filtered into the vial. After the mixture has been completely filtered, seal the flask tightly with his hat and allow the product to dry at room temperature. Step 12: Make sure that the product is completely dried. The weight of the vial while still tightly closed with the lid and with the product inside it; Weight recording. Step 13: Calculate the return per cent of the product. Step 14: Get the infrared spectrum of the product and analyze the peaks. Step 15: Clean all glassware and experimental area. Results: Data and weight calculations of vial + cap = 16.2635g weight of vial + cap + product = 16.3284g actual product yield = 16.3284g - 16.2635g = 0.0649g theoretical return of product = quantity From methyl benzoate used (G)/molecular weight of methyl benzoate x molecular weight of triphenylmethanol = 0.1365g/136.15 x 260.33 = Yg = 0.2609g percent yield = product (g)/ Yg = 0. 0649g / 0.2609g × 100% = yield = 24.87% melting point range: 163.7C - 165.8C IR spectrum: most peaks in the peak fingerprint area at 3473.99 cm-1 represents the peak of alcohol at 3060.58 cm-1 represents carbon to hydrogen Extending (one bonded) peak in 1959.21 cm-1 represents carbon to carbon stretching (double bonded) peak at 1596.90 cm-1 represents carbon to carbon extension (double bonded) discussion/conclusion during the laboratory, a phenyl magnesium bromide reaction was conducted with methyl benzoate to produce tri-methanehhol. Specific precautions have been taken, such as full drying equipment and quickly sealing bottles tightly to ensure that Gringnard's reaction is free of water. As a result, there was an ample amount of Produced as the final product of Grignard's reaction. During the formation of the product, many color changes and chemical reactions were observed, including the formation of bubbles when distilled water was added to the reaction mixture indicating that magnesium was being dissolved. Also, discoloration was observed in the reaction mixture after a colored amber solution was produced during the formation of magnesium vinyl bromide. Once the contents of #2 vial, which consists of 1.00 mmol (136.5 mg, 0.1361 grams) of methyl benzoate and 1.5 ml of ethel, from the formation of vinylmansium bromide applied to the round bottom vial, a variety of color changes were observed. The colorful amber solution became darker brown, then changed to pink, and finally changed to peach color. When the formation of trivinyl methanol was completed, the reaction mixture was two layers; The resulting liquid product color was observed after the product filter was finished; it was dark orange. After allowing the product to dry, the product got a peach orange color. When weighing, the mthanol triphenyl was produced 0.0649g. It was also observed, at the product melting point, that the product's melting point range was 163.7C-165.8C. Since the product's melting point range was close to the standard fusion point of triphenomethanol, 160OC, it was decided that the product should be fairly pure. When analyzing the infrared spectrum peaks obtained from the product, the various infrared peaks were able to decipher them and the functional groups that were present in the product were identified. The infrared spectrum showed specific peaks at 3473.99 cm-1 indicating the presence of alcohol, 3060.58 cm-1 which represents carbon to hydrogen stretch, 1959.21 cm-1 which represents carbon to the carbon extension, and 1596.90 cm-1 that represent carbon to the carbon extension, and was also an indicator of aromatic bending. Triphenyl methanol consists of an aromatic alcohol and bending group; According to the peaks in the infrared spectrum, the product that was synthesized during the experiment possesses specific functional groups present in the triphenylmethanol structure. It is therefore reasonable to conclude that the production of mitanol triglycerides has been successful. Also, I was able to determine that the yield per percent of the product was 24.87%, suggesting that the acceptable yield of mthanol trivinyl was manufactured during the trial. Although the results of the experiment show the effectiveness of Grignard's reaction in the production of metahanol triphenyls, the return of the product may have increased. During the experiment, more precautions could have been taken to ensure that the reaction was free of water. It is possible that during the process of assembling a microscale device or mixing chemicals to form The reactions of mixtures that water vapor was able to settle along the microscale device, affecting the production of triphenylmethanol. In the event that the water was able to settle along the machine, the yield of triphenelmethanol available after the grignard reaction was completed was probably lower than expected. Precautions such as mixing all the interaction mixtures needed for the experiment can help and end them before assembling the microscale device to reduce the possibility of water effects to enter the Grignard reaction and adversely affect the production of triphenyl methanol. Thus, it is necessary to apply a long amount of precautions and maintain the effectiveness of the water-free reaction; This will most likely result in increased product return and greater accuracy in results. Literature cited Teixeira, Jennifer M., et al. practice laboratory-driven questions: a new pedagogical application to a green modification to form a Grignard detector and reactive. Journal of Chemical Education 87.7 (2010): 714-716. Masterson, Douglas and Tina Masterson. First and second organic chemistry. Dubuque: Kendall Hunt Publishing Company, 2010. Print. Print.