جامعة الانبار

كلية : الصيدلة

قسم : الكيمياء الصيدلانية

اسم المادة باللغة العربية: الكيمياء العضوية

اسم المدة باللغة الإنكليزية**Organic Chemistry lab**

المرحلة: الثالثة

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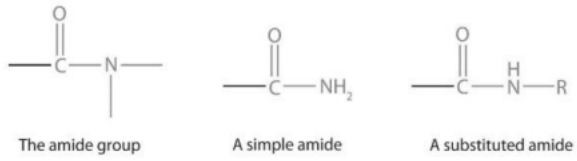
عنوان المحاضرة باللغة العربية: تجربة تحضير البنزانالايد

عنوان المحاضرة باللغة الإنكليزية: **Synthesis of Benzanilide**

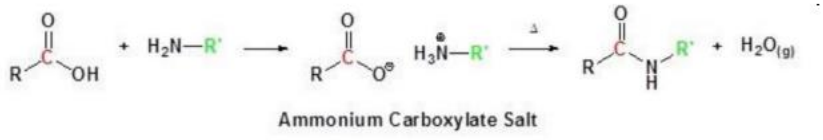
Synthesis of Benzanilide

Amides are amine derivatives of carboxylic acids. The amide functional group has a nitrogen atom attached to a carbonyl carbon atom. If the two remaining bonds on the nitrogen atom are attached to hydrogen atoms, the compound is a simple amide. If one or both of the two remaining bonds on the atom are attached to alkyl or aryl

groups, the compound is a substituted amide.



The carbonyl carbon-to-nitrogen bond is called an amide linkage. This bond is quite stable and is found in the repeating units of protein molecules, where it is called a peptide linkage. The direct reaction of a carboxylic acid with an amine would be expected to be difficult because the basic amine would deprotonate the carboxylic acid to form a highly unreactive carboxylate.

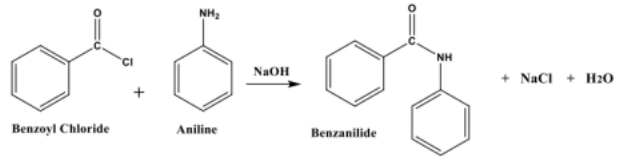


Benzanilide or N-phenylbenzamide is a simple amide. Commercially available, it may be prepared by reacting benzoic

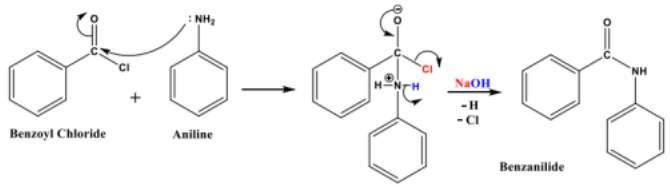
acid and aniline directly. Benzanilide can be prepared by the treatment of aniline with benzoyl chloride. Benzanilide has also been prepared from benzamide, aniline, and boron fluoride. it is used as an anti atherosclerotic agent and also in the manufacture of dyes perfumes, as fungicide and acaricide. Benzyl chloride is an acid halide (also known as an acyl halide) is an organic compound derived from carboxylic acids by replacing a hydroxyl group with a halide group. Insertion of benzoyl moiety instead of an active hydrogen atom present in hydroxyl (OH) primary amino (NH2) or secondary amino group (NH) is usually termed as benzoylation reaction. The essentially bears a close resemblance to the phenomenon of acetylation except that in this specific instance the reagent is (benzoyl chloride) which reacts in the presence of 10 % NaOH and not benzoic anhydride. The reaction occurs preferably between benzoyl chloride and amine. In the preparation of benzanilide, NaOH neutralizes the liberated HCl and also catalyze the reaction. Recrystallisation of benzanilide: Ethanol can be used in recrystallisation of benzanilide. The product, benzanilide, is soluble in hot ethanol, but not in cold ethanol. Any impurities that are expected to arise from the reaction are not soluble in hot ethanol and soluble in the cold ethanol, and thus it is the perfect solvent for the recrystallization process, as only benzanilide is

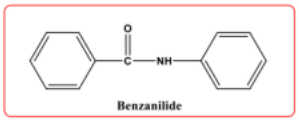
soluble in it and when it is cooled only benzanilide will crystallize out, while any impurities will be left behind in the solution.

Reaction Equation:



Mechanism:

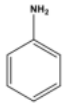




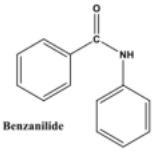
Procedure:

1. Place 2.0 mL (2.08 g) of aniline and 30 mL of (10 % NaOH) solution in 250 mL conical flask with a good rubber cork and shake well.
2. Add 3.0 mL (3.4 g) of benzoyl chloride slowly, 1.0 mL at a time and shake well.
3. Cork the flask and shake for further 15-20 minutes or till the odor of benzoyl chloride can no longer be detected.
4. Dilute the reaction mixture with cold water, filter the crude benzanilide with suction on a Buchner funnel, wash with cold water.

Calculations:



Aniline



Benzanilide

93 g/ mol	197 g/ mol
2.08 g	X

$x\ (Theoretical\ yield\ ) = \frac{197 * 2.08}{93}$ = 4.4 grams