Experiment

Aim: To prepare p-Bromo acetanilide from acetanilide by Bromination reaction.

Reference:

1. Practical Organic Chemistry by Frederick George Mann and Bernard Charles Saunders Published by Longman Inc., Fourth Edition; Page No. 166.

2. Vogel's Textbook of Practical Organic Chemistry by Brian S. Furniss, Antony J. Hannaford, Peter WG Smith & Austin R. Tatchell; Fifth Edition; Page No. 918.

3. Advanced Practical Organic Chemistry by O.P. Agarwal, Page No. 6.

Requirement:

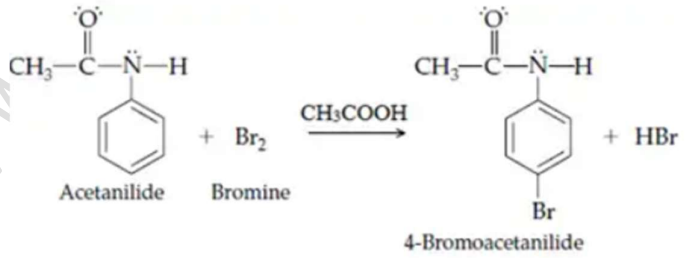
Apparatus: Conical flask, Funnel, Beaker, Filter paper, Burette/separating funnel, etc.

Chemicals: Acetanilide (10 g), Glacial acetic acid (70 ml), Bromine (4.2 ml), Sodium bisulphite (sufficient quantity), Rectified spirit.

Principle:

p-Bromo acetanilide is prepared by bromination process. Mono-substituted products of primary amine cannot be prepared easily by direct action of a reagent. Bromination of acetanilide gives para-brominated acetanilide, mainly because an acetyl group protects an amino group of acetanilide.

Reaction:



Use: It's used as an analgesic and antipyretic agent.

Procedure:

1. Dissolve 10g of acetanilide in 45 ml of glacial acetic acid within a 250 ml conical flask. Cool the acetanilide solution to a temperature below 5 degrees Celsius.

2. Add 4.2 ml of bromine dropwise into 25 ml of cold acetic acid in a separate container, constantly stirring. Transfer the bromine solution into a burette or separating funnel, positioning it over the conical flask.

3. Slowly introduce the bromine solution into the acetanilide solution while stirring continuously. Place the flask in cold water as the reaction generates heat. The solution turns orange when all the bromine is added. Allow the mixture to sit at room temperature for 30 minutes. Pour the flask into a beaker containing 200 ml of ice-cold water.

4. Rinse the conical flask with 50 ml of cold water, transferring the rinse into the beaker while stirring. Observe the separation of para-bromo acetanilide as a white solid.

5. If the solution persists in yellow, add 4-5 g of sodium bisulfite with constant stirring to bleach the coloration.

6. Filter the crude product using suction and wash the residue with cold water. Recrystallize the filtered product from the rectified spirit to obtain the final product.

Calculation:

Molecular formula of acetanilide = C_8H_9NO

Weight of acetanilide = 135 g/mole

Molecular formula of p–bromo acetanilide = C_8H_8NOBr

Weight of p-bromo acetanilide = 214 g/mole

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Result:

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