

Experiment

Aim: To prepare dibenzal acetone from benzaldehyde.

Reference:

1. Mann F. G., Saunders B. C., Practical Organic Chemistry, 4th Edition, Dorling Kindersley. India Pvt. Ltd., New Delhi, Page No. – 231.

Requirement:

Apparatus: Conical flask, Beaker, Funnel, Filter paper and measuring cylinder

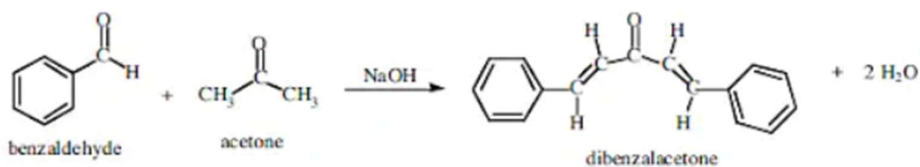
Chemicals: Benzaldehyde, Acetone, Sodium hydroxide, Ethanol, Methylated spirit, Dilute hydrochloric acid, Ether, etc.

Principle:

Aldehydes and ketones that contain at least one alpha hydrogen undergo self-condensation in the presence of dilute alkali or acid to form β -hydroxy aldehyde and ketones, respectively. The initial product undergoes dehydration to form α, β unsaturated aldehydes and ketones. This whole reaction is termed an Aldol condensation reaction/ Claisen Schmidt condensation reaction.

According to Claisen Schmidt condensation reaction in the presence of sodium hydroxide, the aldehyde can condense with another aldehyde by replacing a water molecule. Thus, benzaldehyde condenses with one mole of acetone to give dibenzalacetone.

Reaction:



Use: It is used as a component in sunscreens and as a ligand in organometallic chemistry. It is also used in the production of palladium radiopharmaceuticals or identification of medicinal plants and their constituents.

Procedure:

Steps to get dibenzalacetone from acetone and benzaldehyde in the presence of sodium hydroxide-

1. Add 10 ml (10.4 gm) of freshly distilled benzaldehyde and 20 ml of acetone to a conical flask.
2. Place the conical flask in cooling condition and add sodium hydroxide dropwise with constant stirring. Make sure the temperature is at 30° Celsius. Keep stirring the solution until sodium hydroxide is completely soluble.
3. Add hydrochloric acid to the reaction and transfer it to a 250ml separating funnel.
4. Add 20ml of ether/chloroform and stir nicely. Remove the obtained organic layer and repeat the process twice.
5. Keep the mixture in a cooling condition, preferably ice water; as a result, dibenzalacetone will separate as a fine emulsion and form yellow crystals.
6. Filter and dry the crystals using filter paper.
7. The product is recrystallized from hot methylated or rectified spirit.

Calculation:

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Result:

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