AIM: To prepare and submit 2,3- diphenyl quinoxaline from benzyl and calculate its percentage yield.

REFERENCES: 1. Vogel's Textbook of Practical Organic Chemistry by Brian S. Furniss, Antony J. Hannaford, Peter W. G. Smith & Austin R. Tatchell; Fifth Edition; Page No. 1190.

REQUIREMENTS:

Chemicals: o-Phenylenediamine, Benzil, Rectified spirit

Apparatus: Beaker, Buchner funnel, Measuring cylinder, Filter paper, etc.

Principle: This is a method of condensation of an aryl 1,2-diamine with a 1,2-dicarbonyl compound by heating in a solvent-like rectified spirit. Here condensation reaction of 1,2-diamines with αdiketones occurs with cyclization.

Reaction:

o-phenylenediamine *Benzil* *2,3- diphenylquinoxaline*
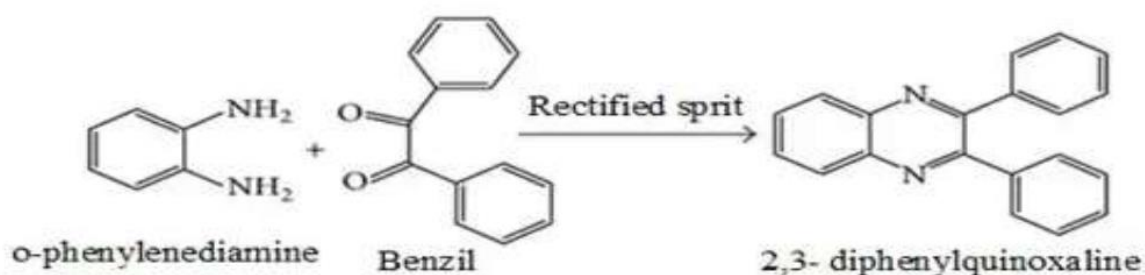
Use: Used as anti-viral, anti-bacterial, anti-inflammatory, anti-protozoal, anti-cancer (colon cancer therapies), antidepressant, anti-HIV agent and kinase inhibitor, etc. PROCEDURE To a warm solution of 2.1 g (0.01 mol) of benzil in 8 ml of rectified spirit, mix a solution of 1.1 g (0.01 mol) of o-phenylenediamine in 8 ml rectified spirit. Warm in a water bath for 30 min, add water until a slight cloudiness persists, and allow to cool. Filter and recrystallize from aqueous ethanol to give 1.43 g (51%) of 2,3-diphenyl quinoxaline, m.p. 125-126 °C.

Calculation:

Here limiting reagent is benzil; hence yield should be calculated from the amount taken.

The Molecular formula of benzil = $C_{14}H_{10}O_2$

The molecular formula of 2,3-diphenyl quinoxaline = $C_{20}H_{14}N_2$

The Molecular weight of benzil = 210 g/mole

The Molecular weight of 2,3-diphenyl quinoxaline = 282 g/mole

Theoretical yield:

210 g benzil forms 282 g 2,3-diphenyl quinoxaline

Therefore, 2.1 g benzil will form …….? (X) g 2,3-diphenyl quinoxaline = 2.82 g Theoretical yield = 2.82 g

Practical yield = ——————- g

% Yield = (Practical Yield)/(Theoretical Yield) × 100

Result: 2,3-diphenyl quinoxaline was synthesized and the percentage yield was found to be………..%