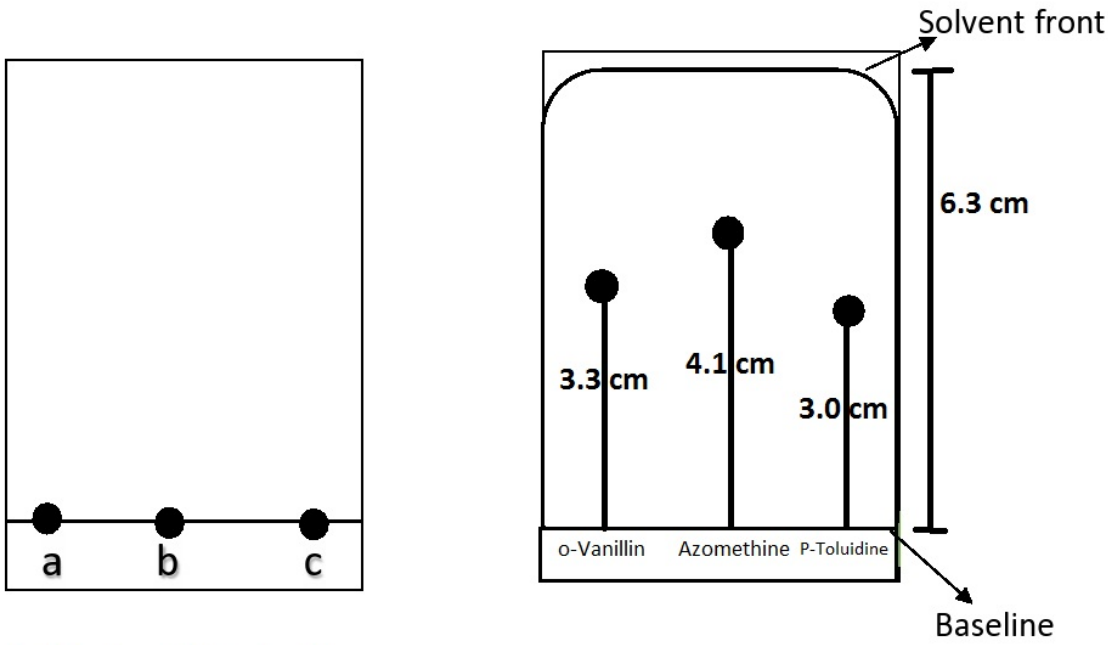
Observation

TLC : Solvent system : 5% Ethyl acetate in Hexane



R_f Value Calculation:

Distance travelled by the solvent front: 6.3cm

Distance travelled by the product : 4.1 cm

Distance travelled by o-Vanillin : 3.3cm

Distance travelled by p-Toluidine : 3.0cm

R_f of Azomethine: 4.1cm/6.3cm = 0.65

R_f of o-Vanillin =3.3/6.3 = 0.52

R_f of p-Toluidine = 3.0/6.3 = 0.47

% Yield Calculation:

Amount of o-Vanillin taken = 430mg (2.8 mmol)

Amount of 4-amino toluene taken = 300mg (2.8 mmol)

Molecular mass of o-Vanillin = 152.15 g/mol

So, no of moles of Azomethine formed theoretically = 2.8 mmol

Molecular mass of Azomethine = 241 g/mol

Theoretical yield of Azomethine = 2.8 X 241 = 674.8 mg

Mass of Azomethine obtained practically = 624.19 mg

$$\text{Therefore, \% yield} = \frac{\text{Experimental yield}}{\text{Theoretical yield}} \times 100$$

$$= 624.19/674.8 \times 100 = 92.5\%$$

Result

1. % yield = 92.5%
2. R_f of the product = 0.65
3. Melting point = 104-109 ^{0}C

Precautions:

1. Measure the weights of the reactants as well as the product very carefully.
2. The product should be dried properly as it will affect in the Melting point measurement.
3. Do not disturb the chromatogram while performing TLC.
4. Take care of the UV light as long exposure is dangerous.

Application:

1. This reaction does not require solvents, leaves no by-product and does not require heating or cooling. This is a good example of green reaction.
2. Azomethine is used as a dye.
3. % yield is high.
4. This reaction is thermodynamically and kinetically favoured and rate of the reaction is very high.