

Observations :

- 1) * Mole fraction of methanol increased from 0.61 (at total reflux) to 0.71 (at $R=1.9$) then decreased to 0.70 (at $R=1$) in the distillate.
* For $R=1$, the mole fraction increases slightly with time in the distillate and bottom.
- 2) * Mole fraction of ethanol increases with decrease in reflux ratio at bottoms while decreases for decrease in reflux ratio at the distillate.
* The mole fraction decreases for ethanol at the bottom with time.
- 3) * Mole fraction of butanol obtained at the bottom increases with decrease in reflux ratio.
* Mole fraction of butanol at bottoms increases with time.

Conclusion :

- Minimum number of tray required is 1
- Minimum reflux ratio $R_{min} = 0.2$

Sources of Error :

- Miscommunication between the 8 people performing the experiment in noting the readings.
- Error in weighing cyclohexane
- Presence of impurities in sample put in GC

Hypothesis :-

Increasing Reflux Ratio should increase mole fraction of methanol at distillate.

We have observed a strange trend of first increase in methanol mole fraction as we reduced the reflux ratio from total to 1.9

This error could have been possibly due to, involved in
 → discrepancy in the reported and used value for cyclohexanone as the area obtained is relatively huge.

→ Overlapped reading of Methanol & Ethanol by the GC.