EXPERIMENT NO.5

Object
To determine the specific rotation of cane sugar dissolved in water.

Apparatus:
Polarimeter, 100 CC flask, Polarimeter tube(2dm), Sugar (.5 gm)

Theory:
The rotation produced by an optically active substance depends upon:

1. The wavelength of light used
2. the temperature
3. The path traveled by ray of light (length of polarimeter tube)
4. The density or concentration of given solution.

Suppose length of polarimeter tube = 1 unit
Concentration of solution used = gm/cc

The angular rotation produced (corresponding to given wavelength and temperature), $\theta = \alpha\, l\, C$

Where α is called specific rotation.

$$[\alpha]_T^\lambda = \frac{\theta}{lC}$$

$$[\alpha]_T^\lambda = \frac{rotation\ \ in\ \ degrees}{length\ \ in\ \ decimeters \times concentration\ in\ gm/cc}$$

When $l = 1$ decimeter, $C = 1$ gm/cc, then $\alpha = \theta$

So we can define **specific rotation** as the rotation produced by one decimeter length of solution of a unit concentration for a given wavelength and at the given temperature.

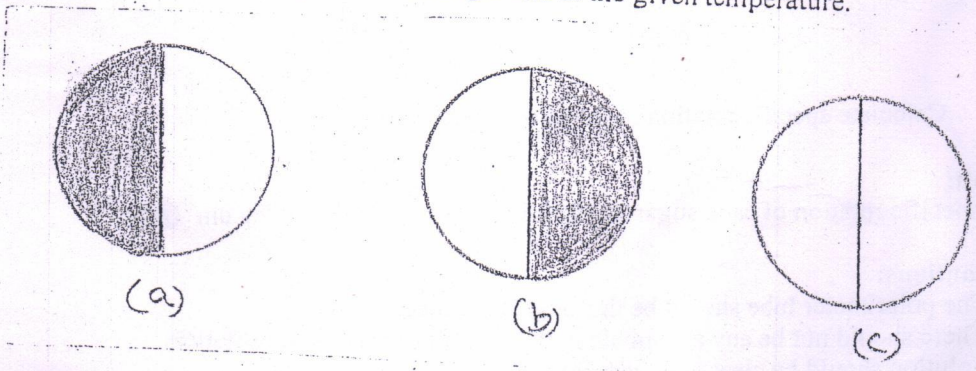

Fig. 1. Field of view through analyzer

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