

## Aim of the Experiment

To learn the parts of a Travelling Microscope and to read a reading.

## Apparatus Required

Reading lens and capillary tube.

## Theory

It is a compound microscope attached to a graduated vertical pillar, which is mounted on rigid platform as shown in the figure below. The platform is provided with three levelling screws. The microscope can be set with its axis either in the vertical or the horizontal position. The microscope can be moved in the vertical or horizontal direction by means of a screw arrangement attached to it. The distance through which the microscope is moved is read on the scale. There are two scales one for horizontal movement and the other for the vertical movement.



Each scale has a main scale (M1, M2) and a vernier scale (V1, V2). The vernier moves with the microscope. As in the spectrometer, there is a set of main screw and fine adjustment screw, for the horizontal and the vertical movements. One set is fixed to the pillar for vertical movement and the other set is fixed to the platform for horizontal movement. The eyepiece of the microscope is provided with cross-wires. The image of an object is focussed by the microscope using a side screw (focusing screw) attached to the microscope.

## Procedure

1. To find the Least Count (LC) of the travelling microscope:

The main scale is graduated in mm. There are 50 V.S.D equivalent to 49 M.S.D. The value of one M.S.D. is  $0.5\text{mm} = 0.05\text{cm}$

$\text{LC} = 1 \text{ M.S.D} - 1 \text{ V.S.D.}$

$1 \text{ M.S.D} = 0.05 \text{ cm}$

$$50 \text{ V.S.D} = 49 \text{ M.S.D}$$

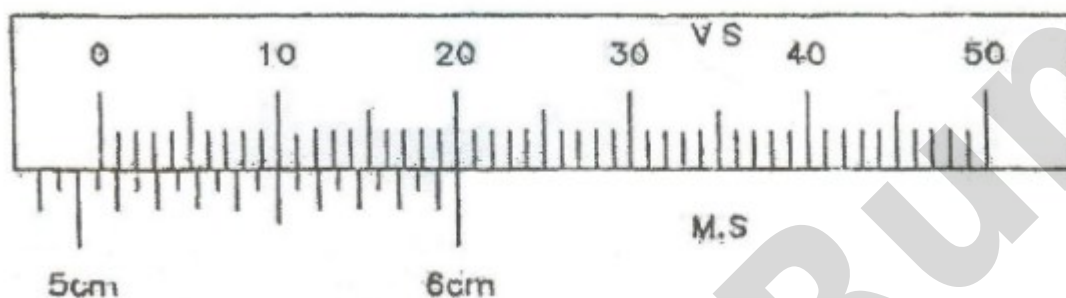
$$1 \text{ V.S.D} = 49/50 \times 0.05 = 0.049 \text{ cm}$$

$$\text{LC} = 0.05 - 0.049 \text{ cm}$$

$$\text{LC} = 0.001 \text{ cm}$$

2. To read a reading:

When the microscope is clamped by the main screw or fine adjustment screw at any position, the reading is taken in the vertical scale or in the horizontal scale according to the requirement. M.S.R and V.S.R are taken as in the vernier calipers. For example see below figure and write the M.S.R and V.S.R



Note: In the Vernier calipers, travelling microscope and the spectrometer, the MS zero may coincide with the VS zero. In such cases, the MSD, which coincides with the VS zero is the MSR reading.

## Observation

Least Count L.C = 0.001 cm

| S.No. | M.S.R (cm) | V.S.C div | V.S.R = V.S.C x LC (cm) | T.R = M.S.R + V.S.R (cm) |
|-------|------------|-----------|-------------------------|--------------------------|
| 1     | 5.05       | 20        | 0.02                    | 5.07                     |
| 2     |            |           |                         |                          |
| 3     |            |           |                         |                          |
| 4     |            |           |                         |                          |

## Result

The parts and functions of the travelling microscope are studied and a few readings are taken.