

Chapter IV
RESULTS AND DISCUSSIONS.

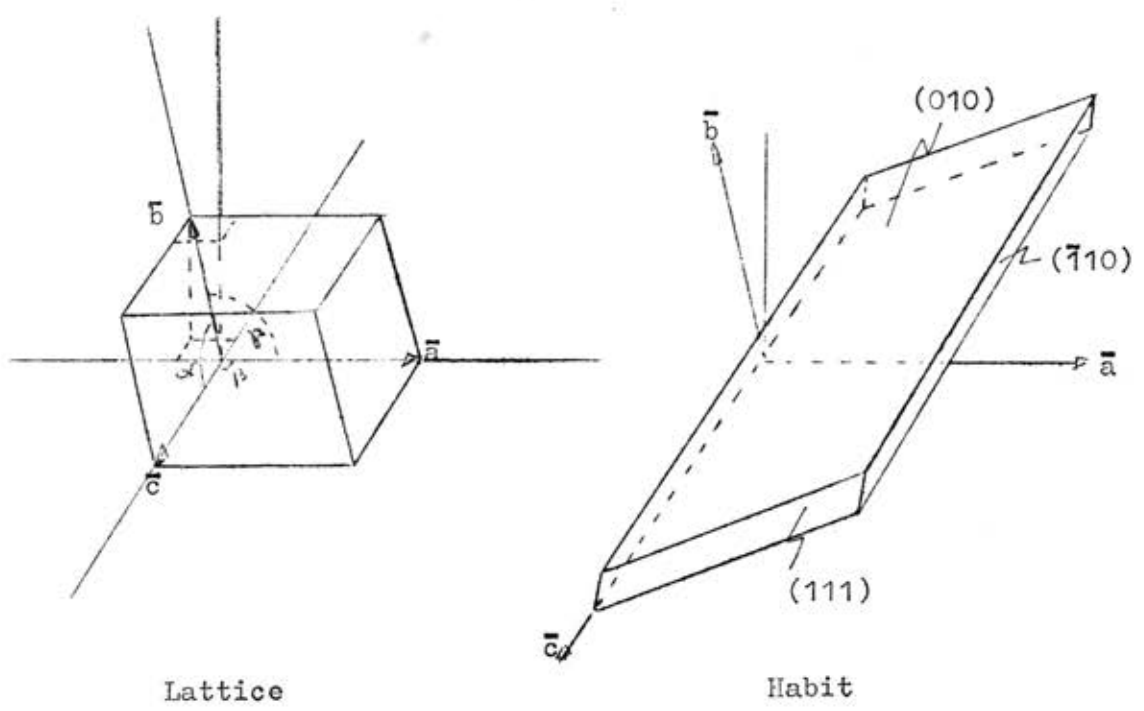
The crystal habit and lattice of Stemonone ($C_{19}H_{14}O_8$) crystal were shown in Fig 19, the habit of the crystals were mostly formed with (010), ($\bar{1}10$) and (111) planes. The lattice parameters calculated from the observed data are

$$\begin{aligned} a &= 12.73 \text{ \AA} , & \alpha &= 105^\circ 14' , \\ b &= 9.90 \text{ \AA} , & \beta &= 90^\circ , \\ c &= 8.25 \text{ \AA} , & \gamma &= 124^\circ 42' , \\ a:b:c &= 1.28 : 1 : 0.83. \end{aligned}$$

There are 2 molecules per unit cell, giving a calculated density of 1.519 gm/cm^3 in agreement with the observed density 1.514 gm/cm^3 . The space group is either $P1$ or $P\bar{1}$, the structure being either non-centro or centro-symmetrical class.

The reciprocal axes were chosen from the \bar{c} rotation axis. Weissenberg photographs but \bar{c}^* was not directly obtained from the photograph, and the axes could not be confirmed by powder photograph. Since the crystals consist of low atomic weight atoms (O,C,H) with the same order of atomic weights as those of atoms in the surrounding atmosphere (O,N,C,H) powder photographs should be taken in vacuum but appropriate equipments were not available at the time of the experiment.

Future studies should include the method of taking powder photograph in a reduced pressure camera, and from the powder photograph all the results obtained should be refined by the least squares method. These studies should also include the study of optical activity of the crystal which should be helpful in determining the space group of the crystal.



Lattice

Habit

| | |
|-------------------------|---------------------|
| $a = 12.73 \text{ \AA}$ | $= 105^\circ 14'$ |
| $b = 9.90 \text{ \AA}$ | $= 90^\circ$ |
| $c = 8.25 \text{ \AA}$ | $= 124^\circ 42'$ |
| $a : b : c$ | $= 1.28 : 1 : 0.33$ |

Fig. 19 Lattice and habit of Stemonone crystals.