

Polarisation by Double Refraction :-
 When a beam of unpolarised light is allowed to pass through an anisotropic crystal (calcite or quartz), and it splits up into two refracted beams instead of one, this phenomenon is called double refraction. It is shown in Fig-1. The ordinary ray (O-ray) and Extraordinary ray (E-ray) are given as

O-ray, $\frac{\sin i}{\sin r_1} = \text{constant} \quad \text{--- (1)}$

E-ray, $\frac{\sin i}{\sin r_2} = \text{Function of } 'i' \quad \text{--- (2)}$

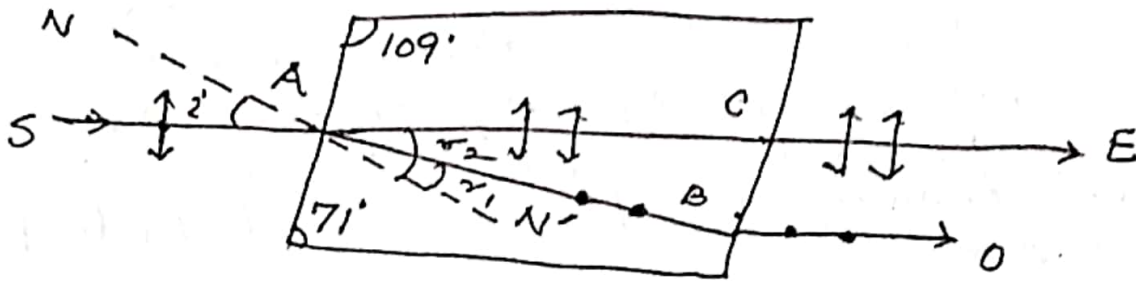


Fig-1 Principal Section of CaCO_3

If we place a calcite crystal in front of a point marked on the paper, we will in general see two images of the point. The appearance of two images is due to the phenomenon of double refraction. Hence, this phenomenon is called polarisation by double refraction.

The former is called ordinary ray (O-ray) and latter is called Extraordinary (E-ray).

When $E\text{-ray} < O\text{-ray}$ then the crystal is called positive crystal, while $E\text{-ray} > O\text{-ray}$ then the crystal (quartz) is known as Negative crystal (calcite) (example - calcite).