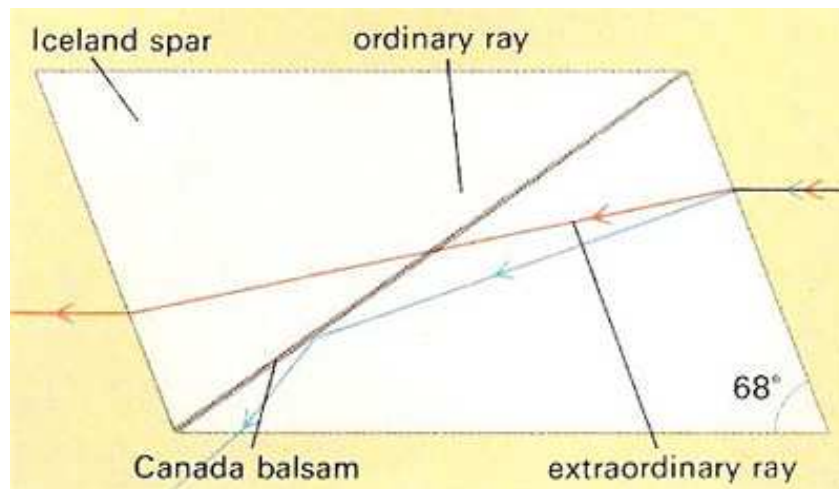


NICOL PRISM

Nicol prism is one of the most valuable means of producing a polarised beam of light since it polarises it completely using the property of Iceland spar of a differing refractive index in different axes of the crystal or double refraction. It has been named after the name of its inventor William Nicol who was a Scottish Professor. The prism is constructed from a Rhombohedron of Iceland spar, which is a transparent variety of Calcite.

Construction

The nicol prism is made from a long transparent cleaved rhomb of Iceland spar. The ends are ground down till they make an angle of 68° to the long edge. The rhomb is cut into two, longitudinally by a plane running through the two corners. The two halves are cemented with Canada balsam. Excluding the two ground ends the remaining ends are painted with a dull black light absorbing pigment.



When ray of light enters the one end of the prism, the ordinary ray meets the Canada balsam film at an angle greater than critical angle so that it is totally reflected into the blackened wall of the prism. The extraordinary ray meets the Canada balsam film at an angle shorter than the critical angle so that it passes through the Nicol and polarized light emerges.

For the extraordinary ray calcite exhibits a refractive index of 1.516 which is less than the refractive index of Canada balsam (1.547) so that it is refracted into the balsam towards the normal and then back to the original direction upon entering the upper calcite prism. Light wave along the extraordinary ray vibrates in the plane of paper i.e. in a plane parallel to the c-axis to form an excellent source of polarized light.