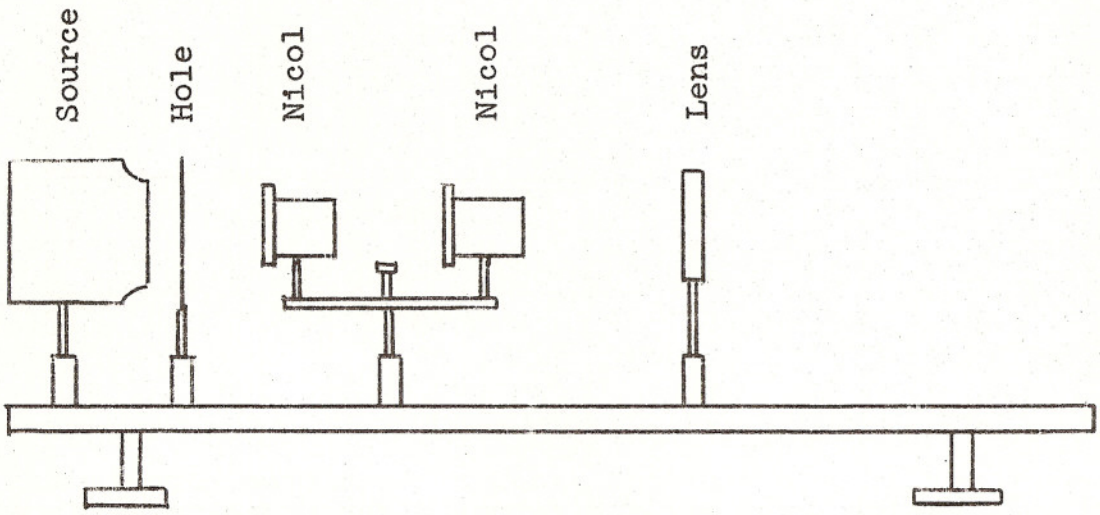
Nicol Prisms

L-Cart



Before demonstrating the behavior of a Nicol prism, you may wish to show the wooden model and explain how the crystal is cut and recemented to form the Nicol.

Set the source on the optical bench at zero and adjust for approximately parallel light. Place 1/2" diameter hole at approximately 19, two-Nicol mount at approximately 35 (oriented so the light enters the smaller of the two end holes in the Nicol), and lens (f = +17 cm) at approximately 50. Place bench at (lecturer's) left, front corner of lecture table, and orient to cast image on the wall screen. (See Note 1.)

Remove the second Nicol (analyzer), and adjust lens to focus on the screen the image of the entrance hole of the first Nicol. Show that rotation of this Nicol has no effect upon the intensity. Nevertheless, the light has been changed by the Nicol. It has been plane polarized, as can be shown by holding a polaroid beyond the Nicol and rotating it.

Now insert the second Nicol (analyzer) in such a direction that the light enters the smaller of the two end holes, and rotated so that the indices on the two Nicols are in the same direction. (The entire field of the image can be made bright by slight adjustment of the two-Nicol mount about a vertical axis, and perhaps a slight adjustment of the source about a horizontal axis.) Rotate the second Nicol and observe that the intensity depends upon the relative orientations of the two Nicols.

Note 1: If you prefer, the image can be cast on a ground glass screen set at 115 on the optical bench, instead of on the wall screen. In this case the bench should of course be oriented with the screen toward the students.

Note 2: The indices on the Nicols, as well as those on the polaroids correspond to transmission of the electric vector.