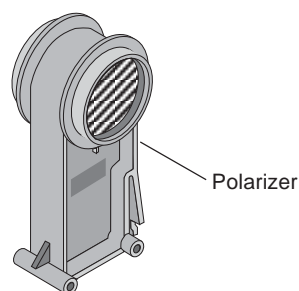


**Instruction Sheet
for the PASCO
Model OS-8473**

POLARIZER SET



Introduction

The PASCO OS-8473 Polarizer Set is designed to demonstrate the polarization of light with the Basic Optics System.

Theory

A polarizer only allows light which is vibrating in a particular plane to pass through it. This plane forms the “axis” of polarization. Unpolarized light vibrates in all planes. Thus if unpolarized light is incident upon an “ideal” polarizer, only half will be transmitted through the polarizer. (Since in reality no polarizer is “ideal”, less than half the light will be transmitted.) The transmitted light is polarized in one plane. If this polarized light is incident upon a second polarizer, the axis of which is oriented such that it is perpendicular to the plane of polarization of the incident light, no light will be transmitted through the second polarizer (Figure 1).

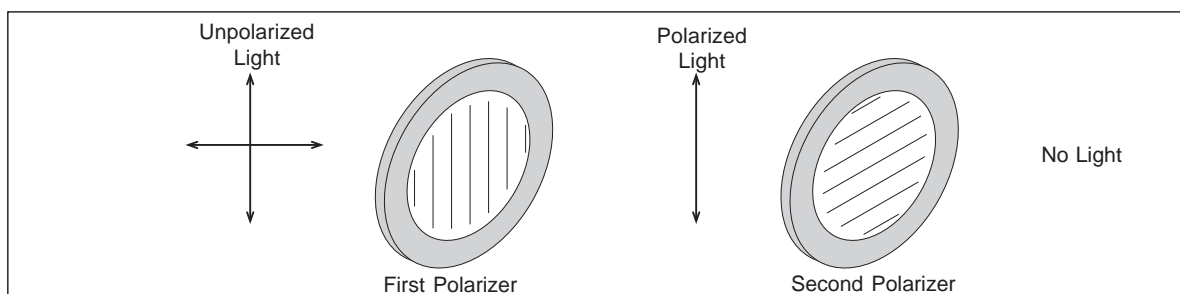


Figure 1: Unpolarized light incident on two polarizers oriented perpendicularly to each other.

However, if the second polarizer is oriented at an angle so that it is not perpendicular to the first polarizer, there will be some component of the electric field of the polarized light that lies in the same direction as the axis of the second polarizer, and thus some light will be transmitted through the second polarizer (Figure 2).

The component, E , of the polarized electric field, E_0 , is found by using trigonometry: $E = E_0 \cos\phi$. Since the intensity of the light goes as the square of the electric field, the transmitted light intensity is given by $I = I_0 \cos^2\phi$, where I_0 is the incident light intensity and ϕ is the angle between the axis of polarization of the incident light and the polarizer.

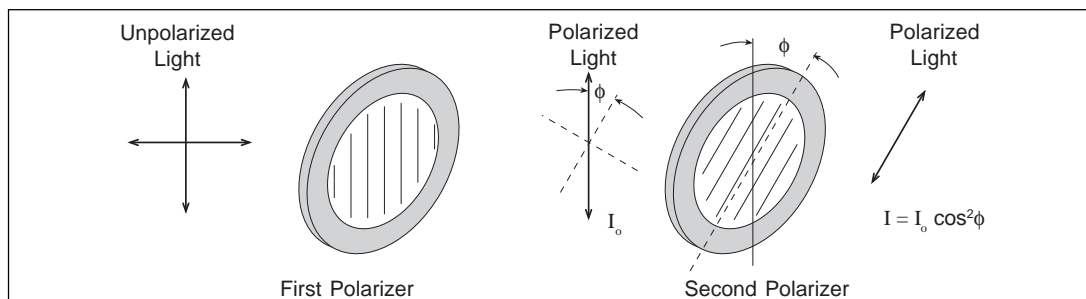


Figure 2: Unpolarized light incident on two polarizers oriented at an angle ϕ with respect to each other.

Equipment

The OS-8473 Polarization Set includes:

- Polarizing Filters (2)
- Accessory Holder (1)

To use the polarizers, snap a polarizing filter on each side of the accessory holder.

Rotate the polarizers relative to one another to view the effect on light intensity.

Limited Warranty

For a description of product warranty see the PASCO catalog.

Contacting Technical Support

Address: PASCO scientific
10101 Foothills Blvd.
Roseville, CA 95747-7100

Phone: (916) 786-3800
(800)772-8700

Copyright Notice

The PASCO scientific 012-09205 Polarizer Set Instruction Manual is copyrighted with all rights reserved.