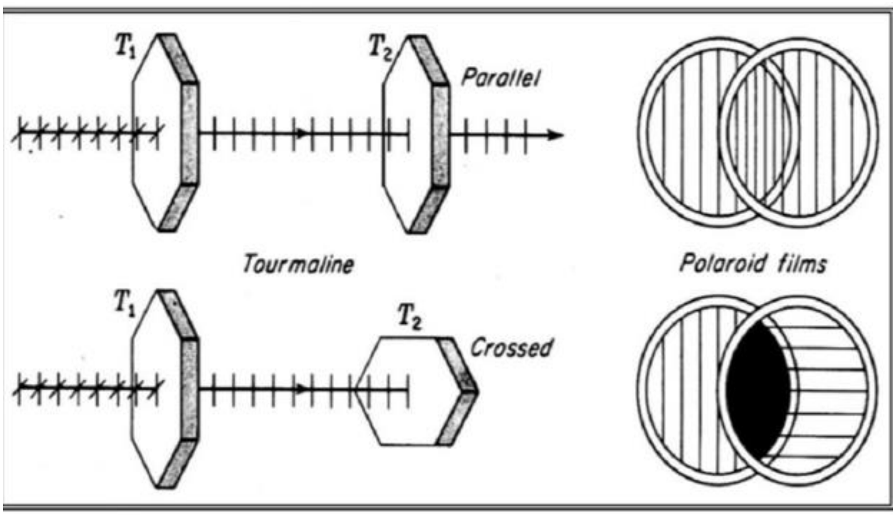
Experiment with absorption polarisation

The purpose of the experiment: Realization of the MULS law

Tools used: Light source. Measure of intensity. Screen. Crystals Tourmaline.

Polarisation with two-colour crystals: These crystals have the selective absorption property of one of the two orthogonal compounds in normal light. A number of mineral ores and some organic compounds show a bi-colour phenomenon. Tourmaline is probably one of the best mineral crystals. When a thin beam of ordinary light falls on a thin slice of tourmaline (polariser), as in the figure, the out-light is polarized. This can be verified by a second crystal (analyser). By making the polariser and the analyzer parallel, the light permeable from the first is also expected from the second crystal (the analyser)When the second crystal (the analyser) is administered by 90 °, there is no light penetration from it. This phenomenon is due to the selective absorption by tourmaline of all light rays that vibrate at a certain level.



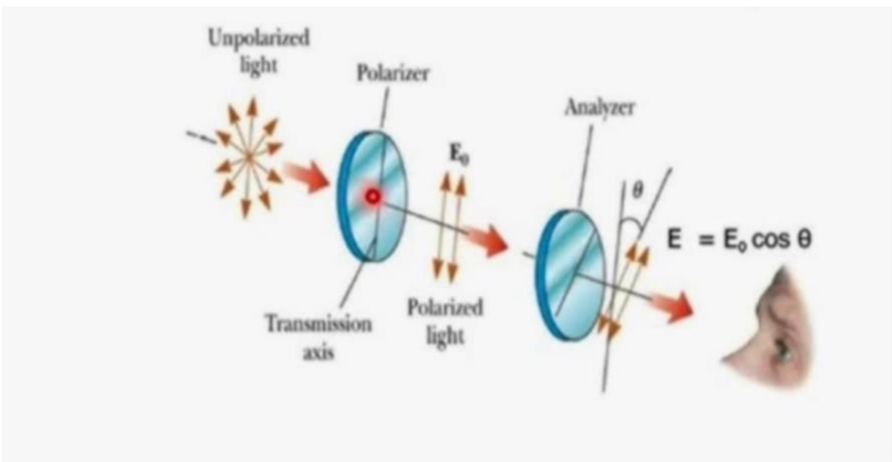
first crystal used is called the polarizer, which is The responsible for the formation of polarized light, and the second crystal that comes after the first is called an analyst, which is responsible for detecting whether the light will or not polarize completely or molecularly.

Malus law(How to change the intensity passed by the analyser with the change of the angle it makes with the polariser)

Theory: The proof of Malus law is based on the fact that any equatorially polarized light, for example (light resulting from a polarizer), can be analyzed into two components, one of which is parallel to the plane of penetration of the analyser and the other is perpendicular to it. The first component is some of them are allowed to enter

(Malus law) $I = I_o \cos^2\theta$

I: Polarised light intensity
Io: Light intensity measured by optical intensity metre (passer from analyzer)
θ: The angle between the polarizing plate and the analyzing plate. If the analyzer is parallel to the polarizer, then the intensity is (I)it becomes approximately equal to (I.)in intensity Almost because the light loses some of its intensity as a result of absorption in the analyzer



The method of work :

1-Fix the angle of the polarizing plate at zero and record the reading of the intensity scale at Io Care must be taken to not change in the distance between the polarised plate and the intensity gauge

2-**Place the analyzing plate at an appropriate distance from the polarizing plate and start changing the angle by degrees and record. For each angle, read the intensity scale 1 and record the readings in an appropriate table.**

3-Change the angle of the polarizer (0 - 30 - 50 - 60 - 90) and repeat step 2 above, changing the angle in degrees Suitable and record the readings in the table.

θ	I	cos	cos2
0	1.3		
30	0.9		
50	0.7		
60	0.6		
90	0		

Polarisation in physics is a phenomenon that describes the vibration of a wave in a certain direction, and it includes three main types:

1- Linear polarisation:where vibrations are at one level.
2- Circular polarisation:where vibrations are circularly.
3- Elliptical: where vibrations spread oval.

Polarisation Uses:

1- Used in sunglasses to reduce glare.

2- Used in spectroscopy.

3- Optics, communications, image quality optimization and others.

*** Unpolarized light includes natural and synthetic light, including sun, candlelight, incandescent lamps, and neon lights.**