

2.5.01-00 Polarisation by quarterwave plates



What you can learn about ...

- Plane
- Circularly and elliptically polarised light
- Polariser
- Analyzer
- Plane of polarisation
- Double refraction
- Optic axis
- Ordinary and extraordinary ray

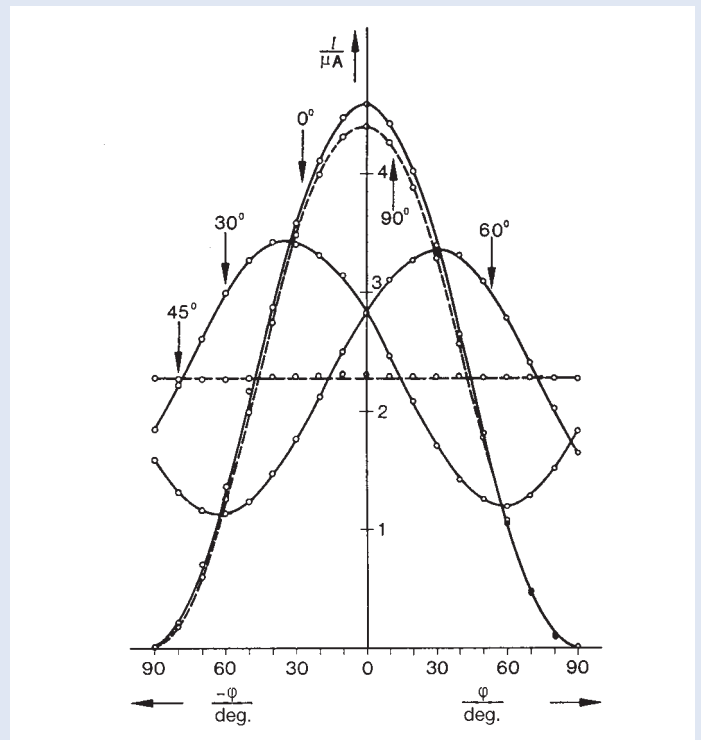
Principle:

Monochromatic light falls on a mica plate perpendicular to its optic axis. At the appropriate plate thickness ($\lambda/4$, or quarter-wave plate) there is a 90° phase shift between the ordinary and the extraordinary ray when the light emerges from the crystal. The polarisation of the emergent light is investigated at different angles between the optic axis of the $\lambda/4$ plate and the direction of polarisation of the incident light.

What you need:

Photoelement for optical base plate	08734.00	1
Lens holder	08012.00	3
Lens, mounted, $f = +100$ mm	08021.01	1
Diaphragm holder for optical base plate	08040.00	2
Iris diaphragm	08045.00	1
Double condenser, $f = 60$ mm	08137.00	1
Condenser holder	08015.00	1
Mercury vapour high pressure lamp, 50 W	08144.00	1
Power supply 230V/50 Hz for 50 W Hg-lamp	13661.97	1
Interference filter yellow, 578 nm	08461.01	1
Polarisation filter on stem	08610.00	2
Optical profile bench, $l = 1000$ mm	08282.00	1
Base for optical profile bench, adjustable	08284.00	2
Slide mount for optical profil bench, $h = 30$ mm	08286.01	8
Slide mount for optical profil bench, $h = 80$ mm	08286.02	1
Polarisation specimen, mica	08664.00	2
Digital multimeter 2010	07128.00	1
Universal measuring amplifier	13626.93	1
Connecting cable, 4 mm plug, 32 A, red, $l = 75$ cm	07362.01	1
Connecting cable, 4 mm plug, 32 A, blue, $l = 75$ cm	07362.04	1

Complete Equipment Set, Manual on CD-ROM included
Polarisation by quarterwave plates P2250100



Intensity distribution of polarised light as a function of the direction of transmission of the analyser: with $\lambda/4$ plate at various angular settings.

Tasks:

1. To measure the intensity of plane-polarised light as a function of the position of the analyser.
2. To measure the light intensity behind the analyser as a function of the angle between the optic axis of the $\lambda/4$ plate and that of the analyser.
3. To perform experiment 2. with two $\lambda/4$ plates one behind the other.