

Light and colour**Dispersion of light into colours**

Detection of infrared radiation –
Setup with a zinc sulphide screen

Object of the experiment

1. Detecting infrared radiation by means of a zinc sulphide screen

Setup

- Darken the room completely.

Apparatus

1 Optical bench, S1 profile, 1 m.....	460 310
3 Clamp riders with fixing column.....	460 313
1 Clamp rider with clamp.....	460 311
1 Lamp housing with cable.....	450 60
1 Bulbs, 6 V/30 W, E14, set of 2.....	450 511
1 Diaphragm and slide holder.....	459 33
1 Filter, infrared.....	468 74
1 Lens on rod, $f = + 50$ mm.....	459 60
1 Plate holder on rod.....	459 30
1 Zinc sulphide screen.....	468 72
1 Transformer 6/12 V.....	521 210

Observation

If the zinc sulphide screen is exposed to the daylight, a yellow, lasting phosphorescence of the screen is observed in the dark.

After illumination with infrared radiation, a dark spot, which no longer glows yellow, is seen on the screen.

Evaluation

Short-wavelength radiation (e.g. ultraviolet radiation) can excite a screen coated with zinc sulphide as luminescent material so that it emits visible light for a long time interval (phosphorescence).

Infrared radiation shortens the decay time of the phosphorescence.

Carrying out the experiment

- Before starting the experiment, expose the zinc sulphide screen to the daylight so that it phosphoresces.
- Clamp the phosphorescing zinc sulphide screen in the plate holder.
- Displace the lamp insert so that a circular luminous spot appears on the zinc sulphide screen.
- Insert the infrared filter in the diaphragm and slide holder.
- Illuminate the zinc sulphide screen with infrared light for approximately 2-3 minutes.
- Switch the optics lamp off, and observe the luminous effect on the screen.