Light and colour
Dispersion of light into colours
Ultraviolet radiation in the continuous spectrum -
Setup with an ultraviolet phosphorescent screen

Object of the experiment

1. Detection of ultraviolet radiation in the continuous spectrum of an incandescent lamp

Setup

- Align the filament of the incandescent lamp vertically by turning the lamp insert, and pull the lamp insert out by approx. 3 cm.
- Position the condenser lens (f = + 50 mm) behind the lamp at a distance of approx. 2cm.
- Adjust a slit width of approx. 1.75 mm.
- Stick a sheet of white paper to the translucent screen by means of adhesive tape.
- To adjust the experiment setup, keep the prism out of the ray path, and place the translucent screen on the back third of the optical bench.
- Displace the imaging lens (f = + 100 mm) until a sharp image of the slit appears on he translucent screen. Then remove the translucent screen from the optical bench, and set it up at a distance of approx. 30 cm and at an angle of approx. 60° with respect to the optical bench.
- Darken the room completely.

Remark:

The result from D 5.6.1.5 (detection of ultraviolet radiation by means of an ultraviolet phosphorescent screen) should be known to the students before the experiment is carried out.

Apparatus

1 Optical bench, S1 profile, 1 m	460 310
5 Clamp riders with fixed column	460 313
2 Clamp riders with clamp	460 311
1 Lamp housing with cable	450 60
1 Bulbs, 6 V/30 W, E14, set of 2	450 511
1 Plate holder on rod	459 30
1 Lens on rod, f = + 50 mm	459 60
1 Lens on rod, f = + 100 mm	459 62
1 Adjustable slit on rod	471 71
1 Prism, flint glass	465 32
1 Candle holders, set of 2	459 31ET2
1 Extension pins, set of 2	686 60ET2
1 Screen, translucent	441 53
1 Card with emission colours	469 82
1 Transformer 6/12 V	521 210

Carrying out the experiment

- Set up the flint glass prism in the ray path, and turn the candle holder on the clamp rider until a wide spectrum of high light intensity appears on the translucent screen.
- If necessary, correct the sharpness of the spectrum by displacing the imaging lens.
- Set up the ultraviolet phosphorescent screen in front of the spectrum, and observe the luminous effect.

Observation

In the invisible spectral region the coated side of the ultraviolet phosphorescent screen glows green.
No visible radiation is emitted by the uncoated side of the screen in this region.

Evaluation

In the continuous spectrum of an incandescent lamp, there is a transition from the short-wavelength visible violet spectral region to the invisible ultraviolet region.

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