## Object of the experiment

1. Demonstrating the release of electrons from the surface of a zinc electrode irradiated with UV light

## Setup

Safety notes:
UV radiation damages the retina:
Do not look directly into the ray path of the high-pressure mercury lamp.

During continued operation, the housing of the high-pressure mercury lamp is warmed up to temperatures over 100 °C. After switching the lamp on, only touch the socket of the lamp.

When connecting the electrometer amplifier, mind the remarks of the instruction sheet 532 14.

Only non-hazardous contact voltages (e.g. from the power supply 450 V (522 27)) are to be used for supplying the electrodes with voltage.

- Switch the high-pressure mercury lamp on, and wait for about 5 minutes.
- At first do not direct the radiation towards the experimental setup.
- Sandpaper the zinc plate before inserting it in the setup.

## Apparatus

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| 1 Zinc and grid electrodes | 546 31 |
| 1 Electrometer amplifier | 532 14 |
| 1 Connecting rod | 532 16 |
| 1 Resistor, 1 GΩ, STE2/19 | 577 02 |
| 1 Demo-multimeter, passive | 531 906 |
| 1 Power supply, 450 V | 522 27 |
| 1 High pressure mercury lamp | 451 15 |
| 1 Power supply unit for high-pressure mercury lamp | 451 195 |
| 2 Connecting leads 19 A, 50 cm, red/blue, pair | 501 45 |
| 1 Connecting lead, 19 A, 50 cm, black, pair | 501 451 |
| 1 Connecting lead, 32 A, 50 cm, black | 501 28 |
| 1 Laboratory stand II | 300 76 |

## Carrying out the experiment

- Apply a direct voltage of 450 V to the electrodes (grid electrode +, zinc electrode -) holding the connecting rod in one hand.
- Irradiate the zinc electrode with UV light from a distance of approx. 20 cm, the light being directed through the grid electrode.
- Observe the pointer deflection at the measuring instrument.
- Change the polarities of the electrodes, and repeat the experiment.

## Observation

If the negatively charged zinc electrode is irradiated with UV light, the pointer deflection at the multimeter decreases.

A current flows between the electrodes.

If the positively charged zinc electrode is irradiated with UV light, no current is detected.

## Evaluation

When the zinc electrode is irradiated with UV light, electrons escape from the surface of the electrode.

This process is called photoemissive effect.

If the grid electrode is positive with respect to the zinc electrode, an electric current can flow.



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