

Physics

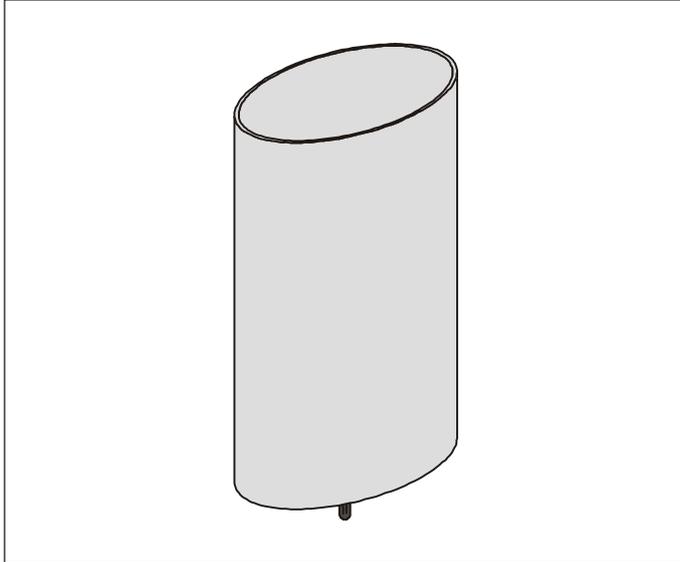
Chemistry · Biology

Technology



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## Instruction sheet 546 12

Faraday's cup (546 12)

### 1 Description

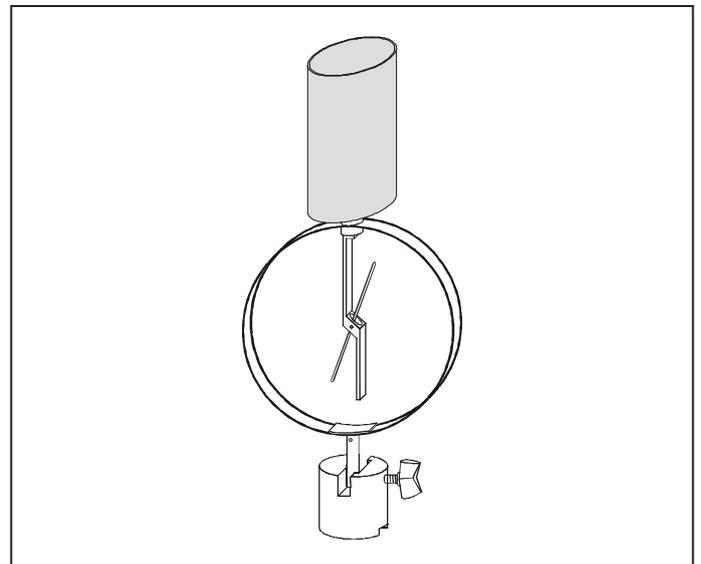
By the example of the Faraday's cup some fundamental characteristics of electrically leading hollow bodies in the electrostatic equilibrium can be shown: They carry electric charges only on their outside surface. There is no electric field in the cavity and the electric potential is constant. If a loaded electrical conductor affects the inside of the Faraday cup, then the charge is completely delivered. If a loaded body dives into the interior, then positive and negative charges in the wall of the Faraday's cup are locally separated (influence). The total load on the outside of the Faraday's cup agrees with the immersed charge, the total load on the inside is opposite alike.

### 2 Technical data

Diameter: 7 cm  
Height: 13 cm  
Connection: 4 mm plug

### 3 Experiment examples

#### 3.1 Proofing charges with an electroscope (540 091):

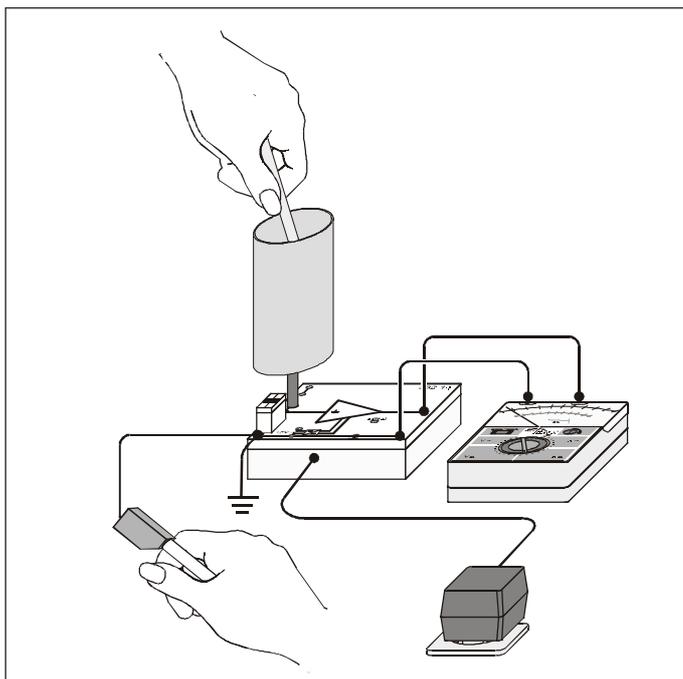


*Additionally required:*

1 Electroscope	540 091
1 Saddle base	300 11
1 Pair of friction rods	541 00
or	
1 Induction plate	542 51

- Take off the metal plate from the socket of the electroscope and attach the Faraday's cup.
- Unload Faraday's cup by affecting it with a grounded metal bar.
- Immerse. loaded bodies or affect the inside of the Faraday's cup with loaded body.

### 3.2 Measuring charges with the electrometer amplifier (532 14):



*Additionally required:*

1 Electrometer amplifier	532 14
1 Clamping plug	590 011
1 Connection rod	532 16
1 STE condensor 1 nF, 630 V	578 25
1 Volt meter DC, up to $U = \pm 10$ V	e.g. 531 120
1 Pair of friction rods	541 00
or	
1 Induction plate	542 51

- Attach the other Faraday's cup with the clamping plug.
- Attach the STE capacitor 1 nF.
- Connect the connection rod to earth using a connection lead.
- Connect the voltmeter to the output.
- Supply the electrometer amplifier with voltage from the plug-in unit.
- To measure the charge, discharge the Faraday's cup by touching it with the connection rod, then take the connection rod in your hand, and move the charged body to the inner wall of the Faraday's cup.