

Capacitance of metal spheres and of a spherical capacitor 4.2.03-00



What you can learn about ...

- Voltage
- Potential
- Charge
- Electric field
- Electrostatic induction
- Electrostatic induction constant
- Capacitance
- Capacitor
- Dielectrics

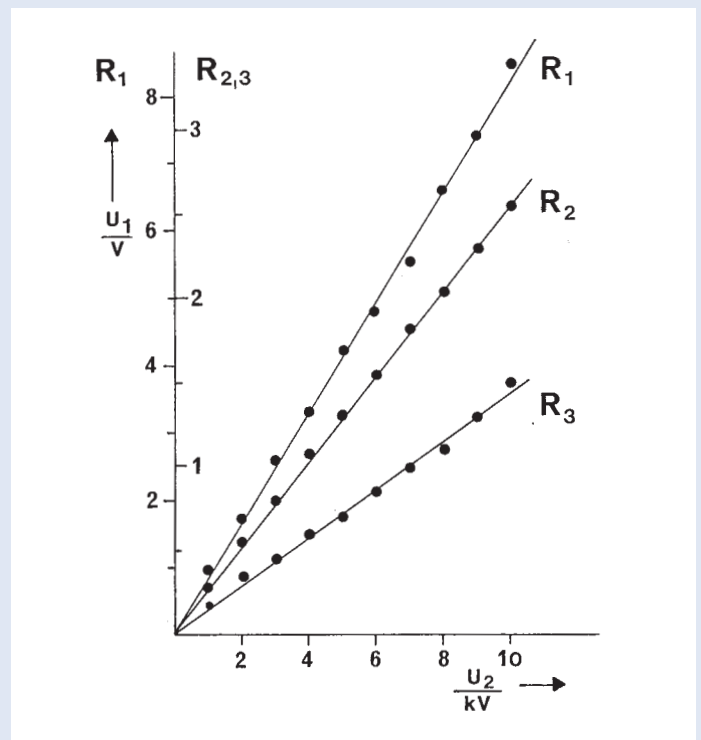
Principle:

Metal spheres with different radii and a spherical capacitor are charged by means of a variable voltage. The induced charges are determined with a measuring amplifier. The corresponding capacitances are deduced from voltage and charge values.

What you need:

Conducting ball, $d = 20$ mm	06236.00	2
Conducting ball, $d = 40$ mm	06237.00	1
Conducting ball, $d = 120$ mm	06238.00	1
Hemispheres, Cavendish type	06273.00	1
Hollow plastic ball with eyelet	06245.00	1
Capillary tube, AR-glass, straight, $l = 250$ mm	36709.00	1
Copper wire, $d = 0.5$ mm	06106.03	1
Insulating stem	06021.00	2
High value resistors, 10 M Ω	07160.00	1
High voltage supply 0...10 kV	13670.93	1
Capacitor 10 nF/ 250 V, G1	39105.14	1
Universal measuring amplifier	13626.93	1
Multi range meter, analogue	07028.01	1
Digital multimeter 2010	07128.00	1
Connecting cable, 30 kV, $l = 1000$ mm	07367.00	1
Screened cable, BNC, $l = 750$ mm	07542.11	1
Adapter, BNC socket - 4 mm plug	07542.20	1
T type connector, BNC, socket, socket, plug	07542.21	1
Adapter, BNC plug/ 4 mm socket	07542.26	1
Vernier caliper, plastic	03011.00	1
Barrel base -PASS-	02006.55	2
Support base -PASS-	02005.55	1
Right angle clamp -PASS-	02040.55	4
Support rod -PASS-, square, $l = 630$ mm	02027.55	1
Support rod -PASS-, square, $l = 400$ mm	02026.55	1
Universal clamp with joint	37716.00	1
Crocodile clips, black, strong version, pack of 10	29426.03	1
Connecting cable, 4 mm plug, 32 A, green-yellow, $l = 10$ cm	07359.15	1
Connecting cable, 4 mm plug, 32 A, green-yellow, $l = 75$ cm	07362.15	2
Connecting cable, 4 mm plug, 32 A, blue, $l = 50$ cm	07361.04	2
Connecting cable, 4 mm plug, 32 A, red, $l = 50$ cm	07361.01	2

Complete Equipment Set, Manual on CD-ROM included
 Capacitance of metal spheres
 and of spherical capacitor P2420300



U_1 (measured voltage) as a function of U_2 (charging voltage) measured on conducting spheres with three different diameters.

Tasks:

- Determination of the capacitance of three metal spheres with different diameters.
- Determination of the capacitance of a spherical capacitor.
- Determination of the diameters of each test body and calculation of their capacitance values.