Charging curve of a capacitor 4.2.02-01

What you can learn about ...

- ➔ Charging
- ➔ Discharging
- ➔ Time constant
- ➔ Exponential function
- ➔ Half life

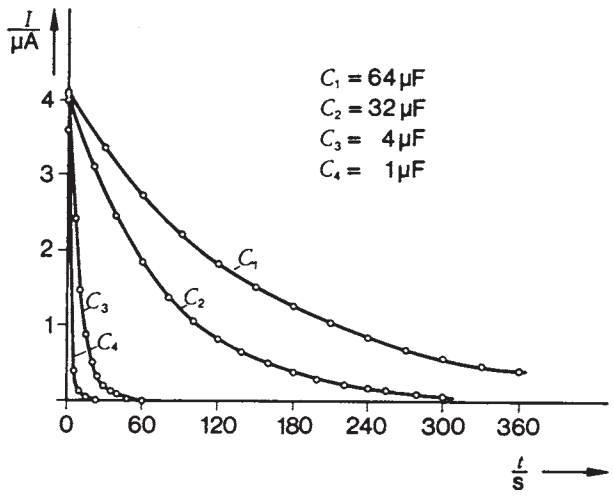
Principle:

A capacitor is charged by way of a resistor. The current is measured as a function of time and the effects of capacitance, resistance and the voltage applied are determined.

What you need:

Connection box	06030.23	2
Two way switch, single pole	06030.00	1
Capacitor 2 x 30 µF	06219.32	1
Carbon resistor 100 Ω, 1W, G1	39104.63	1
Carbon resistor 1 MΩ, 1W, G1	39104.52	4
Connecting plug white 19 mm pitch	39170.00	2
Capacitor 1 microF/ 250 V, G2	39113.01	1
Capacitor 4,7 microF/ 250 V, G2	39113.03	1
Power supply 0-12 V DC/ 6 V, 12 V AC	13505.93	1
Stopwatch, digital, 1/100 s	03071.01	1
Digital multimeter 2010	07128.00	1
Connecting cable, 4 mm plug, 32 A, red, *l* = 25 cm	07360.01	3
Connecting cable, 4 mm plug, 32 A, blue, *l* = 25 cm	07360.04	4

Complete Equipment Set, Manual on CD-ROM included
Charging curve of a capacitor P2420201



Course of current with time at different capacitance values; voltage and resistance are constant (U = 9 V, R = 2.2 MΩ).

Tasks:

To measure the charging current over time:

1. using different capacitance values C, with constant voltage U and constant resistance R
2. using different resistance values (C and U constant)
3. using different voltages (R and C constant).

To determine the equation representing the current when a capacitor is being charged, from the values measured.