5.2.01-01 Half-life and radioactive equilibrium

What you can learn about ...

- ➔ Parent substance
- ➔ Daughter substance
- ➔ Rate of decay
- ➔ Disintegration or decay constant
- ➔ Counting rate
- ➔ Half life
- ➔ Disintegration product

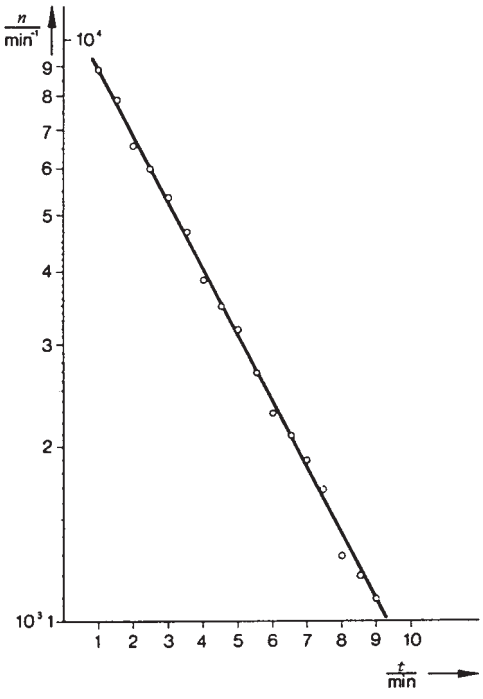
Principle:

The half-life of a Ba-137 m daughter substance eluted (washed) out of a Ca-137 isotope generator is measured directly and is also determined from the increase in activity after elution.

What you need:

Isotope generator Cs-137/ Ba, 370 kBq	09047.60	1
Pulse rate meter	13622.93	1
Digital multimeter 2010	07128.00	1
Counter tube, type A, BNC	09025.11	1
Stopwatch, digital, 1/100 s	03071.01	1
Aluminium, sheet, 1 x 20 x 200 mm, 5 pcs.	31074.00	1
Tripod base -PASS-	02002.55	1
Support rod -PASS-, square, l = 250 mm	02025.55	1
Right angle clamp -PASS-	02040.55	2
Universal clamp	37718.00	2
Beaker, DURAN®, short form, 250 ml	36013.00	2
Test tube, AR-glass, d = 16 mm	37656.10	1
Screened cable, BNC, l = 750 mm	07542.11	1
Connecting cable, 4 mm plug, 32 A, red, l = 50 cm	07361.01	1
Connecting cable, 4 mm plug, 32 A, blue, l = 50 cm	07361.04	1

Complete Equipment Set, Manual on CD-ROM included
Half-line and radioactive equilibrium P2520101



Logarithmic plot of the counting rate of the eluted daughter substance as a function of time.

Tasks:

1. To record the counting rate as a function of the counter tube voltage (counter tube characteristic) when the isotope generator activity is constant (radioactive equilibrium).
2. To measure the activity of the isotope generator as a function of time immediately after elution.
3. To measure the activity of a freshly eluted solution of Ba-137 m as a function of time.