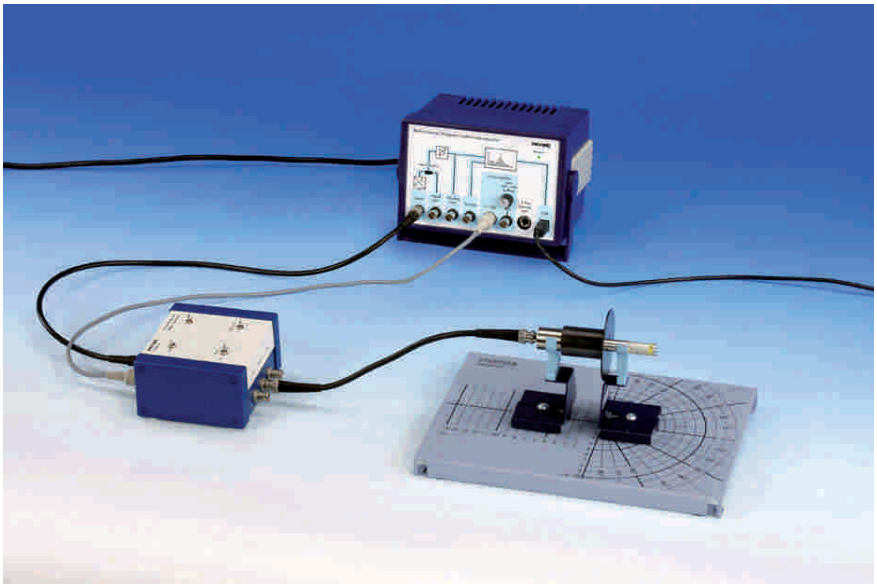
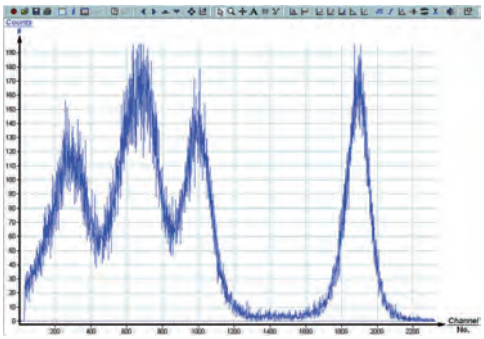
P2522015 Alpha energies of different sources with MCA





Alpha-spectrum of the ^{226}Ra.

Principle

An alpha-spectrometer, consisting of a photodetector, a preamplifier, a pulse height analyser and a recording device for registration of the spectra is calibrated by means of an open alpha-emitter of known alpha energy (^{241}Am). The energy spectrum of a radium source which is in equilibrium with its decay products, is recorded and evaluated. The alpha-energies found in this way are allocated to the corresponding nuclides of the radium decay series.

Tasks

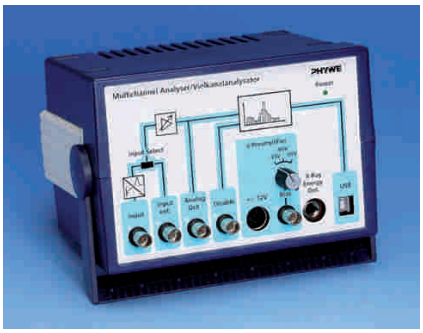
1. The Alpha-spectrum of the ^{226}Ra is recorded with multichannel analyzer.
2. The calibration spectrum of the open ^{241}Am alpha-emitter is recorded at the same settings.
3. The alpha-energies corresponding to the individual peaks of the alphaspectrum of the radium are calculated and compared to the values in the literature.

What you can learn about

- Decay series; Radioactive equilibrium
- Isotopic properties
- Decay energy
- Particle energy
- Potential well model of the atomic nucleus
- Tunnel effect
- Geiger-Nuttal law
- Semiconductor
- Barrier layer

Main articles		
Multi channel analyser	13727-99	1
Radioactive source Am-241, 3.7 kBq	09090-03	1
Radioactive source Ra-226, max. 4 kBq	09041-00	1
Pre-amplifier f.alpha detector	09100-10	1
Alpha and Photodetector	09099-00	1

Multichannel analyser



Function and Applications

The multichannel analyser is for analysing voltage pulses which are proportional to energy and for determining pulse rates and intensities in conjunction with an X-ray detector, alpha detector or gamma detector. The analogue pulses from the detector are shaped by the analyser, digitised and summed per channel according to pulse height.

This results in a frequency distribution of detected pulses dependent on the energy of the radiation.

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