

Multi-channel Alpha Spectrometer (2 chambers) based on Silicon Ion Implanted Detector (SIID)



Alpha Spectrometer is intended for transformation of alpha-particle energies into electrical signals, its amplification, filtration, transformation and acquisition and further spectra processing with determination of intensities of spectral lines.

Silicon Ion Implanted Alpha Particle Detectors is a product for the precise alpha spectroscopy. The thin entrance window of the detectors provides good energy resolution even in close location of the alpha radioactive source and also provides high efficiency registration of alpha particles.

The Bench top alpha spectrometer includes:

- 2 alpha spectrometry chambers with preamplifiers, electronics, valves, etc. (another chamber could be closed with plug in case of);
- 1 or 2 alpha-particles detector with a detect area of 450 mm² (other size are available)
- Data acquisition and PC transfer device;
- Built-in spectrometric device
- Vacuum pump;
- Analysis software;
- Emulation software;
- Documentation set.

Specifications

Built-in spectrometric device is intended for amplification and formation of signals from alpha detector, power supplies for detector and preamplifier.

- Basic characteristics of spectrometric electronics are :
 - Count rate: 0-50 000 pulses/s
 - Shaping time constant, switchable: 1 μ s
 - Variable gain coarse and fine: up to 500
 - Noise level (referred to the input) : < 3 μ V for 1 μ s
 - Pole-zero adjustment: available
 - Live time correction: available
 - Opportunity to operate with pulse feedback preamplifier: available
 - Base line auto restoration: available
 - Gain stability: <0,0075 % / s
 - Integral nonlinearity: <0,025%

Alpha spectrometry chamber includes alpha particle detector, pressure sensor and preamplifier of signals from alpha detector.

- Basic characteristics of alpha spectrometer are:
 - Detector area: 450 mm²
 - Detector thickness: 400 μ m (dead layer thickness is less than 500 Angstrom)
 - Detector bias Voltage: >50 V
 - Energy range of detector operation : 3 to 8 MeV
 - Energy resolution for 5,49 MeV: <20 keV
 - Instrumental background: <2 counts per hour
 - Maximum input count rate: >10000 cps

Analysis Software allows to do:

- energy, FWHM, peak form and apparatus peak calibration;
- spectra processing, searching of informative intervals around peaks (spectra marking), peaks position determination (search), approximation of informative intervals using model function and peaks parameters determination (fitting), registration of channels and peaks background, spectra comparison;
- spectrum analysis by Region of Interest (ROI);
- adding and deleting of peaks;
- peaks parameters viewing;
- analyse start and stop;
- viewing of analyzer's state information;
- conversion into other formats and translation into other applications such as MS Word, Excel.



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+32 (0) 69 64 06 04
WWW.SCANNIX.COM
INFO@SCANNIX.COM