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Liquid Scintillation Spectrometer

The principle of operation of the spectrometer is based on the complete absorption of the energy of charged particles in a liquid scintillator, the emission of this energy in the form of a light flash, the conversion of the flash energy into an electrical pulse and the registration of these pulses using two PMTs. The analog signals from each PMT after amplification and formation go to the coincidence circuit for selection during the resolving time. The signal from the output of the coincidence system goes to the input of the MCA in which it is converted into a digital code proportional to the absorbed energy. The resulting codes are accumulated in the computer's memory and form a spectrum of radiation energies.

Application : High-sensitivity spectrometer TRIEL based on a liquid scintillator and it is intended for analytical and technological monitoring of the activity of alpha and beta-emitting radionuclides (for example, H-3, C-14, P-32, Sr-90+Y-90, Pu-238, Pu-241, Pu-242, etc.). The spectrometer provides a complete radioisotope analysis of alpha, beta-emitting radionuclides (with the possibility of detecting beta radiation with energies from 2 keV, high detection efficiency (~ 100% for all alpha particles and for beta particles with energy> 50 keV).

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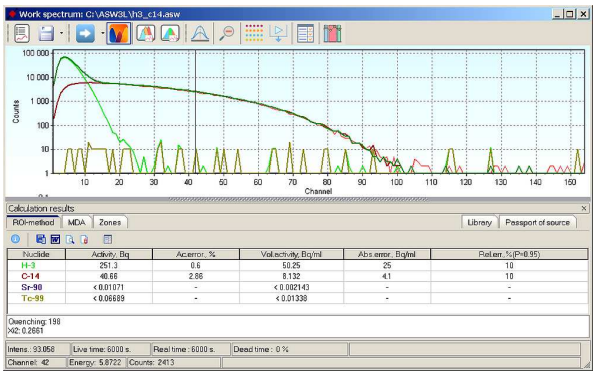
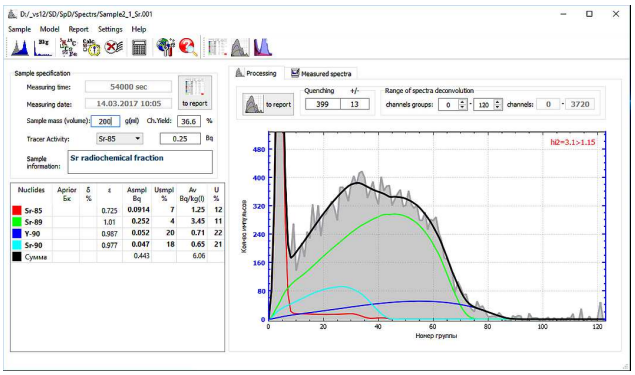
Specifications

- Instrument Shielded (limitation of background noise)
- Energy distribution of - beta radiation within the energy range of: 1 – 3500 keV
  - alpha radiation within the energy range of: 3 - 10 MeV
- Background count rate in H-3 window: 0.25cps
- Range of measured activity of the beta-emitting radionuclides (U=50%, k=2): 0.05 – 30000 Bq
- Sensitivity for beta radiation of radionuclide
  - H-3 more than: 38% (With 2 PMT's). In case of using 1 PMT, the efficiency will growth up to 48%.
  - C-14 more than: 98%
  - Sr-90+Y-90 more than: 99%
- Maximum throughput: 50 kcps
- Instability measurements activity within 24 hours of continuous operation is no more than: ±2%
- Count of channels: 1024, 2048, 4096
- PC interface: USB, RS485
- Power supply: 110V – 240V, 50-60Hz
- Dimensions (WxHxL): 220x160x483 mm
- Weight: ~40 Kg
- Operation temperature range : +10 .. +40 °C
- Relative humidity: <70%
- Power consumption: < 40 W

Software



Basic Software: ASW3L



Optional Software: SPECTRADEC

The basic software (ASW3L) allows you to control the operation of the spectrometer, process the spectra, and also identify radionuclides and calculate the activity in the counting samples.
The processed results and spectra can be stored as files on computer storage devices or presented as reports.

The aim of the optional software (SPECTRADEC) is to solve some radiochemical tasks of identifying and measuring the activity of radionuclides in samples it is possible to use measurement methods that should take into account the level of conformity of the counting and reference samples, the output coefficients during radiochemical concentration, and other relevant additional contributions to the error in determining the activities of radionuclides.