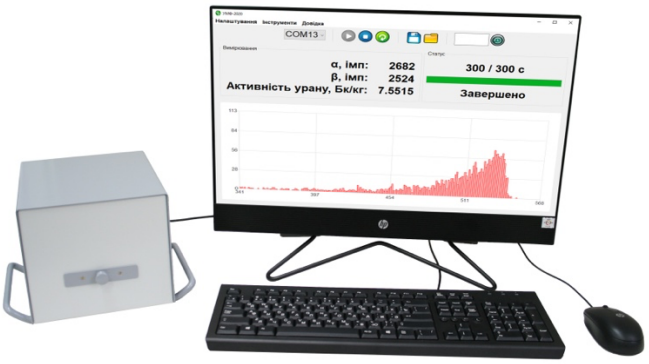
RADIOMETER OF GROSS ALPHA AND BETA ACTIVITY OF RADIONUCLIDES UMF-2020

Purpose

A radiometer is a stationery laboratory device that serves as a counter of alpha- and beta-particles that fall on the detector from the sample located in the measuring cuvette.



A radiometer is aimed to measure:

- a total quantity of pulses from alpha-emitting radionuclides in the count samples;
- a total quantity of pulses from beta-emitting radionuclides in the count samples;
- a total quantity of pulses from external alpha- and beta-emitting of sources type 1S0, 1P9.

The radiometers also can use for measurements which make according to appropriate methods to determine:

- a total activity of beta-emitting nuclides in the count samples which obtained from the samples of food, soil, water, air filters and sorbents;
- an activity of radionuclides in the samples which obtained after selective radiochemical extraction;
- a total activity of alpha-emitting nuclides in “fat” and “thin” of the count samples of environment objects.

The radiometers apply as a a stationery laboratory measurement device in radiological control laboratories to measure of radionuclide activity in the studied samples if there are the appropriate measurement methods, certified under the established procedure.

Features

- two independent channels that provide simultaneous measurement of alpha and beta radiation of the sample;
- active shielding counter is used to compensate for the impact of external background on the primary measurement;
- an access to the measurement data, power supply and radiometer control is provided via a PC through communication lines based on the USB interface.

SPECIFICATIONS

Type of detector	
- beta- and alpha channel	semiconductor detector
- compensation gamma-background	Geiger–Müller counter
Energy range	
- alpha radiation	3 500 – 8 000 keV
- beta radiation	50 – 3 500 keV
Measurement range	
- alpha radiation from reference sources 1P9	1 – 10 000 Bq
- beta radiation from reference sources 1S0	1 – 10 000 Bq
Limits of the main relative error, no more	± 15 %
Sensitivity (semiconductor detector), no less	
- alpha-channel (^{239}Pu)	0,30 $s^{-1}\cdot Bq^{-1}$
- beta-channel (^{90}Sr+^{90}Y)	0,25 $s^{-1}\cdot Bq^{-1}$
Background pulse count rate in the registration channel	
- alpha-radiation, no more	0,001 s^{-1}
- beta-radiation, no more	0,04 s^{-1}
Range of set time intervals of measurements	from 1 to 60 000 s
Minimum measured activity in the alpha channel (radionuclide ^{239}Pu), no more	0.02 Bq
Minimum measured activity in the beta channel (radionuclide ^{90}Sr+^{90}Y), no more	0.09 Bq
Start time of radiometer, no more	30 minutes
A contribution to the beta channel account from the alpha channel for a thin alpha source, no more	1%
Run time of radiometers is not less	24 h
Current consumption of the radiometers when powered via USB, under natural radiation background, and at a nominal supply voltage of 5 V	250 мА
Communication interface	USB
Protection degree, less than	IP54
Ambient temperature range	from +5 °C to +50 °C

Dimensions	244 x 240 x 175 mm
Weight	34 kg

Delivery set: a radiometer UMF-2020, a measuring cuvette (10 pcs), a cable USB-RS10a, a personal computer (per the request), software "UMF-2020" (on CD or other digital storage), operational documentation.

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