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Comparison of the ^{213}Po half-life results measured by double and triple coincidences methods

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Method of measurement and result of processing of the ^{213}Po α -active isotope half-life data measured in long-run continuous measurement with the underground low-background TAU-3 set-up are described. The set-up consists of two scintillation NaI(Tl) 150x150 mm detectors and double-layer (hlayer=1 mm) plastic scintillator detector (PCD) with d=18 mm. Source of the ... $^{213}\text{Bi}\rightarrow^{213}\text{Po}$... decays placed between the PSD layers. The half-life calculated from a decay curve. The curve constructed from delay values between β - and α -pulses detected by the PSD. Two methods used for the event selection. The PSD pulses coincided in 16 mcs time window selected in the first case (double coincidences). Additional pulse of the NaI-SD detected γ - quantum from the ^{213}Bi decay used in the second case for a validation of the ^{213}Po birth and decay (triple coincidences). The values $T_{1/2}=3.6970\pm 0.0005$ mcs for the double coincidences and $T_{1/2}=3.6772\pm 0.0005$ (statistic) ± 0.005 (system) mcs for the triple coincidences were obtained ^{213}Po half-life. Possible reasons of the result difference were discussed.

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