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RADIOCARBON C-14 PRODUCTION UNDER CONDITION OF ATMOSPHERIC FLASHES

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The phenomenon of flashes in the atmosphere is precessed by fast multiplication of electron avalanche in electric fields of about ˜ 300 kV/m [1]. Strong increase of number of relativistic electrons ensures an energetic terrestrial gamma-ray bursts (bremsstrahlung photons created at slowing down of relativistic electrons), that leds to (g,n)-reactions on atmospheric isotopes: so, the cross section 14N(g,n)13N (with Ethreshold ˜10.6 MeV) – within the interval (1-10) mb for Eg =20-60 MeV. By-turn neutron flux leads to generation of radiocarbon 14N(n,p)14C, 40Ar(n,g)41Ar, 14N(n,alpha)B11, 14N(n,g)15N and another reactions [2, 3]. Here we evaluate creation of 14C (exclusively important for radiochronology) the under conditions of terrestrial flashes. The simulation were realized at the several altitudes: 1, 3, 5, 7 and 10 km. Change of atmospheric density was taken into calculation. We propose the top level of 14C production in the atmospheric flashes as ˜2 moles per year. This evaluation is connected only with flashes in the lower part of the atmosphere at the altitudes up to ˜ 15 km. At the same assumption it was obtained the rate of radioactive 41Ar production as ˜4E-3 moles per year. We propose to use creation of 41Ar under condition of terrestrial flashes as sensitive tracer of radiocarbon production under thunderstorms. The control engineering of radioactive 41Ar is well known and continually fixed at accelerator work.

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