

ACCELERATED DEACTIVATION OF WATER SOLUTIONS OF REACTOR RADIONUCLIDES BY TRANSMUTATION TO STABLE ISOTOPES IN GROWING MICROCULTURES (PREHISTORY, EXPERIMENTS, THEORY, PERSPECTIVES)

Vysotskii V.I.¹, Kornilova A.A.²

¹Kiev National Shevchenko University, Kiev, Ukraine, E-mail: vivysotskii@gmail.com;

²Lomonosov Moscow State University, Moscow, Russia

In the report the results of accelerated deactivation of water solutions of radioactive isotopes in growing microbe syntrophin associations (MSA) are presented. The process of deactivation is connected with accelerated nuclear transmutation of long-lived radionuclides to different stable isotopes during growth of MSA. The biophysical aspects of nuclear reactions at growth of biological systems are described in [1-3]. The physical reasons are connected with self similar formation of coherent correlated states of interacting particles in dynamical structure of growing cultures [4-6]. In our initial experiments we have observed the reaction $Ba^{140} + C^{12} = Sm^{152}$ of accelerated (by 3 times) deactivation of radioactive water with Ba^{140} isotope (Fig.1).

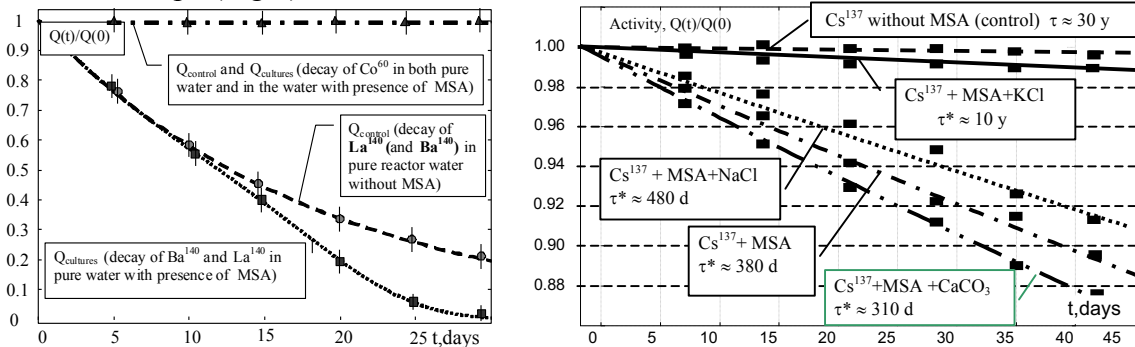
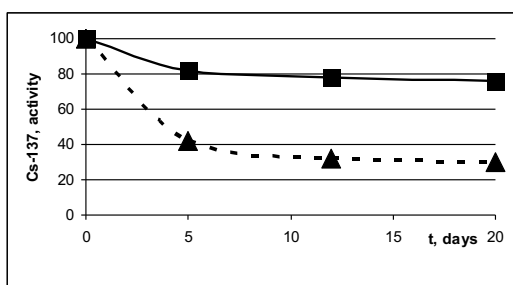


Fig.1. Change of activity of Ba^{140} , La^{140} and Co^{60} isotopes in transmutation experiments

Fig.2. Accelerated deactivation of Cs^{137} isotope reactor at presence of different chemical elements in water

The next experiments has been carried out on the basis of water solution of most danger long-lived reactor Cs^{137} isotope. In control experiment (radioactive water without MSA) the law of Cs^{137} isotope decay was "usual" with life-time $\tau \approx 30$ years. In all experiments with MSA and with the presence of different additional salts in active water (Fig.2.) we have observed speeded up decay of Cs^{137} isotope



by transmutation $Cs^{137} + p = Ba^{138}$. The most speeded (accelerated by 35 times!) transmutation of Cs^{137} isotope with duration $\tau^* \approx 310$ days was observed at the presence of Ca salt in radioactive water. In recent years, further improvements in bio- and nuclear technology has led to significant progress of these processes. In particular, the averaged decrease in Cs^{137} concentration over 14 days was 23%, which corresponds to an acceleration of deactivation of radioactive water more than 200 times ($\tau^* \approx 60$ days). In

some cases decrease in Cs^{137} concentration in these experiments reached 40% and even 70% (Fig.3).

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