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Detection of ultra rare alpha decays of super heavy nuclei

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Three approaches to the measurement of a rare alpha decaying products produced in heavy-ion induced nuclear reactions are described. One is based on a chemical extraction and following deposition of the nuclides under investigation onto the surface of the detector, whereas the second one is associated with long –lived products implanted into silicon detectors by using the electromagnetic separation technique. The third approach relates with an application of real-time mode detection of correlated energy-time-position recoil-alpha sequences from 48Ca induced nuclear reactions with actinide targets, like 242, 244Pu, 245,248Cm, 239Am and 249Cf [1-3]. Namely with this technique it has became possible to provide a radical suppression of backgrounds in the full fusion (3-5n) reactions aimed to the synthesis of super heavy elements with Z=113-116.

[1] Yu.S.Tsyganov and V.I.Tomin, Appl.Radiat. and Isotopes, Vol.49, Nos.1-2, pp.113-115 (1998)

[2] Yu.S.Tsyganov et al. Nucl.Instrum. and Meth. In Phys. Res., A525 (2004)213-216

[3] Yu.Ts.Oganessian et al., Phys. Rev. C69 (2004) 02161.

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