Lithium Neutron Producing Target

B. Bayanov[1], D. Kasatov[1], A. Makarov[1], I. Shchudlo[1], S. Taskaev[1, 2]

[1]Budker Institute of Nuclear Physics, Novosibirsk, Russia
[2]Novosibirsk State University, Russia

email: taskaev@inp.nsk.su

A source of epithermal neutrons for BNCT based on a tandem accelerator with vacuum insulation and lithium neutron producing target were proposed and constructed in BINP. The target is a thin layer of lithium deposited on a thin substrate intensively cooled. Prolonged exposure of the target protons 2 MeV led to the emergence of blisters on a copper substrate that is used at present. Proton fluence leading to blistering was determined. The comparison is given of the experimental value with the evaluative one obtained earlier at the experiments with the 100 and 200 keV proton beam. The results of the activation of the target and the beam transport channel with beryllium, and assumptions are made about the processes at target blistering. To increase the operation time of the target a tantalum substrate is proposed to be used. The new design of a target made with tantalum substrate implementing a number of new ideas is presented and discussed.