



## **Development of the protective layer for the lithium neutron generating target**

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In the Budker Institute of Nuclear Physics an accelerator-based epithermal neutron source is used, among other things, to generate neutrons for BNCT. The neutron beam is generated according to the  ${}^7\text{Li}(p,n){}^7\text{Be}$  reaction while the proton beam hits the solid lithium target. The neutron generating target consists of efficiently cooled copper substrate and a thin (typically 60  $\mu\text{m}$ ) lithium layer. In vacuum lithium is thermally evaporated with a controlled thickness on the copper. After a short time being in air the target becomes inapplicable to be used. Several methods were applied to protect lithium layer. The first method was to put the titanium layer over lithium. Titanium was deposited with a controlled thickness using magnetron sputtering. The second method was to deposit highly refined mineral oil over lithium. For this aim, the thermal vacuum deposition was applied. The paper describes the details and comparative characteristics of these technologies.

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### **Keywords:**

lithium target, protective layer, accelerating epithermal neutron source