

**Paper: COMPARISON OF PHYSICAL SPUTTERING AND ION PLATING METHODS  
FOR INVESTIGATION OF HYDROGEN DISTRIBUTION INTO THE HYDROGEN  
TARGETS**

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**Abstract:**

In this paper, selection of proper method for titanium coating on copper substrate is studied to construct nuclear targets for neutron production in particle accelerators. In order to construct such targets, it is necessary to deposit, through the coating methods, the proper coating of titanium on copper. Among different coating methods, ion plating and sputtering, due to the high coating yield and stability of titanium layers, has been selected. To compare different amounts of hydrogen absorption, two series of targets, different in the coating methods, were exposed to the similar conditions under 40 bar hydrogen gas. Comparison of elastic recoil particles (ERD) results of two series of the targets showed that hydrogen atoms permeated in deeper layer of targets, which were deposited by ion plating, than the targets deposited by sputtering. Hence, it was concluded that the ion plating method is more suitable to make nuclear targets.