

## **The Ways to Increase Light Water Detritiation Efficiency by Chemical Isotope Exchange between Hydrogen and Water in Membrane Contact Devices**

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Chemical isotope exchange of hydrogen gas and liquid water is one of the effective methods for light water waste detritiation. The results of studies concerning the efficiency of detritiation in laboratory-scale facility with membrane contact devices consisting of sulfonated perfluoropolymeric Nafion-like membrane and hydrophobic platinum catalyst RCTU-3SM have been reported earlier [1]. As appeared when operating the facility, after long time the decrease of detritiation efficiency caused by poisoning of the membrane by metal ions formed due to corrosion of the apparatuses materials may be observed. Now the results of studies aimed to clarify the influence of metal ions on water permeability of Nafion-like membrane are presented. It has been shown that modification of the membrane by metal ions and its consequent regeneration allows not only regaining mass-exchange efficiency in the membrane contact devices but also increasing it. For example, replacing membranes in contact devices of the laboratory-scale facility resulted in seven-fold increase (in comparison to previous results) of the column separation degree at comparable conditions.

### Literature.

1. Rastunova I., Rozenkevich M. New Contact Device for Separation of Hydrogen Isotopes in the Water-Hydrogen System. // *Fusion Science and Technology*. 2005, Vol. 48, No. 1, p. 128-131.