

Detritiation behavior of HTO in a epoxy paint

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In a fusion reactor of high safety and acceptability, safety confinement of tritium is one of key issues for the fusion reactor. Tritium should be well-controlled and not excessively released to environment and to prevent workers from excess exposure. Especially, the hot cell and tritium facility of ITER will be used various construction materials such as the concrete and the organic materials. Especially, epoxy paint will be used as paint on the wall to prevent the tritium sorption in the concrete. Transport properties of tritiated water vapor (HTO) in the epoxy paint has been evaluated by the HTO exposure and removal behavior from the epoxy paint in order to obtain the data base of tritium behavior in the confinement facilities such as the hot cell or the tritium plant building of ITER. The experiment was carried out by the two experiments ; one was the HTO vapor exposure to the epoxy paint, another was HTO vapor removal from the epoxy paint after the HTO vapor exposure. Some stainless steel vessel chambers that inside surface were painted by the epoxy paint, were exposed to the air flow with high HTO vapor concentration (740 Bq/cm^3) for 1 week, 2 weeks and 2 months. After these exposures, detritiation of these chambers by the air flow were carried out. It was found that the interaction between the epoxy paint and HTO was reached to equilibrium under the condition. On the basis of these detritiation behaviors, the transport properties were evaluated with the tritium transport analysis code (TMAP). Although diffusivity and solubility of HTO in the epoxy paints almost agreed with the previous investigations, trapping like effect should be considered to explain observed detritiation behavior. By using the obtained transport properties, simulation of detritiation behavior in the room such as hot cell was also carried out.