

Behavior of tritiated water on concrete materials.

K. Kobayashi^{a,*}, T. Hayashi^a, and T. Yamanishi^a

^a*Tritium Technology Group, Japan Atomic Energy Agency, Tokai-mura, Naka-gun, Ibaraki-ken, 319-1195, Japan*

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. The facilities will be used the concrete as the construction materials and organic materials as paint on the wall. Since the organic and the concrete materials will be contaminated by tritium compared with the metal materials such as SS, it is very important to study the tritium behavior on the materials from viewpoint of protection the excess exposure to workers. Tritium behavior on the organic materials have been reported by many researchers. However, limited studies have been reported on tritium behavior on concrete materials. Therefore, in order to understand for tritium behavior on the concrete materials, the sorption and desorption experiment was carried out as a function of the exposure time, temperature and tritiated water concentration. The used samples were cement paste, mortar and concrete. These samples were exposed into ~ several MBq/cm³ of tritiated water at room temperature, 277 K and 323 K. The exposed time was 1day to several weeks. The exposed samples in a certain period were soaked into water at room temperature, 277 K and 323 K, and then the water was periodically measured by Liquid Scintillation Counter (LSC) and the amount of sorbed tritium on the concrete materials were evaluated. From the results, the behavior of tritium sorption and desorption in the concrete materials will be discussed.