§12. Research on Oxidation Factors of Tritium Gas and Fluctuation Factors of Tritium Level in the Environment

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Tritium gas in the environment is oxidized to tritiated water primarily by the enzymatic action of soil microbes and tritiated water transferred into human body ether directly or via food chain may cause some biological effect. Much more studies on the environmental behavior of tritium and its biological effects are expected from health physics standpoints including public acceptance problem before the opening of mass usage of tritium in nuclear fusion plants.

We have conducted several times of heavy water (D_2O) vapor release field experiments using deuterium as a substitute for tritium and comparative studies on dose assessment codes.

The meeting on the environmental behavior of tritium and its biological effects was held at NIFS on February 28, gathering with tritium researchers. The titles and contents of the meeting were as follows.

1. Recent progress of LHD and the research programs in Safety Research Center.
   T. Uda (NIFS)
2. Overview of D_2O vapor release field experiments at Mito campus of Ibaraki University, estimation of DNA damage caused by tritium, dose assessment using UFOTRI, program for assessing the off-site consequences from accidental tritium releases (by W. Raskob).
   Y. Ichimasa (Ibaraki Univ.)
3. Kinetics of D_2O transfer into fruits and rice, and OBD formation in D_2O vapor release field experiments.
   M. Ichimasa (Ibaraki Univ.)
4. D_2O vapor release field experiments: transfer of atmospheric D_2O into plants.
   M. Andoh and H. Amano (JAERI)
5. Comparative studies on the codes for dose assessment to the public due to accidental release of tritium, ACUTRI and UFOTRI.
   H. Noguchi (JAERI)
5. Transfer of D_2O and $^{13}CO_2$ into plants in D_2O vapor release field experiments.
   N. Momoshima (Kumamoto Univ.) and T. Okai (Kyushu Univ.)
6. Analysis of $^{13}CO_2$ transfer into water creatures using a model ecosystem of a tank size.
   H. Takeda and K. Miyamoto (NIRS)
7. Development of a rapid method of collecting atmospheric tritium and determination of tritium concentration.
   T. Kimura (Osaka Pharmaceutical College)
8. A simple method of exact and rapid measuring of ritium concentration in environmental water.
   Y. Sakuma (NIFS)
10. Condensation ratio in determination of tritium concentration in environmental water obtained by an electrolysis-condensation method.
    M. Saito (Kyoto Univ.)
11. Transfer of tritiated water into animal body and assessment of extrapolation of its cancer-causing concentration.
    A. Ito (Hiroshima Univ.)
12. Dose assessment of low dose-rate irradiation using a high-sensitive detection system of mutation.
    K. Komatsu and H. Tauchi (Hiroshima Univ.)
13. Biological effects of tritiated water on tissues of mice and differences between its races.
    A. Watanabe (Hiroshima Univ.)
14. Future research programs and cooperative work in 2001.