

## §5. A Simplified Method for Tritium Measurement in the Environmental Water Samples

Sakuma, Y.

Koganezawa, T., Iida, T. (Graduate School of Engineering, Nagoya Univ.)

Ogata, Y. (School of Health Sciences, Nagoya Univ.)

Kakiuchi, M. (Faculty of Science, Gakushuin Univ.)

Torikai, Y. (Hydrogen Research Center, Toyama Univ.)

Satake, H. (Graduate School of Science, Toyama Univ.)

### 1. Abstract

Liquid scintillation counting is now the most popular method to measure the tritium concentration in the low-level water samples such as environmental water samples. However, it takes much time with a lot of doing to distill off the impurities in the sample water before mixing the sample with the liquid scintillation cocktail. In the light of it, we investigated the possibility of an alternative method with membrane filters for purification. As published before, the filtration method was proved to be available to be alternatively used for tritium measurement. In the present environment water in Japan, the tritium concentration has become nearly 0.5-2Bq/kg-H<sub>2</sub>O which is within the detective limit by the low background liquid scintillation counter. As for the samples lower than the detective limit they will be treated by electrolysis enrichment with liquid scintillation analyzer. Recently an electrolysis tritium enriching method using a solid polymer electrolyte has been developed. According to the method, there is no need to add any electrolyte, neither is the neutralization after concentration. If we could replace the distillation process with the filtration, the procedure would be simplified very much. We investigated the procedure and we were able to prove that the filtration was available.

### 2. Experimental

By means of this simplified procedure which is shown in Fig.1, several measurements were carried out as was shown in Fig.2.

### The Simplified Method

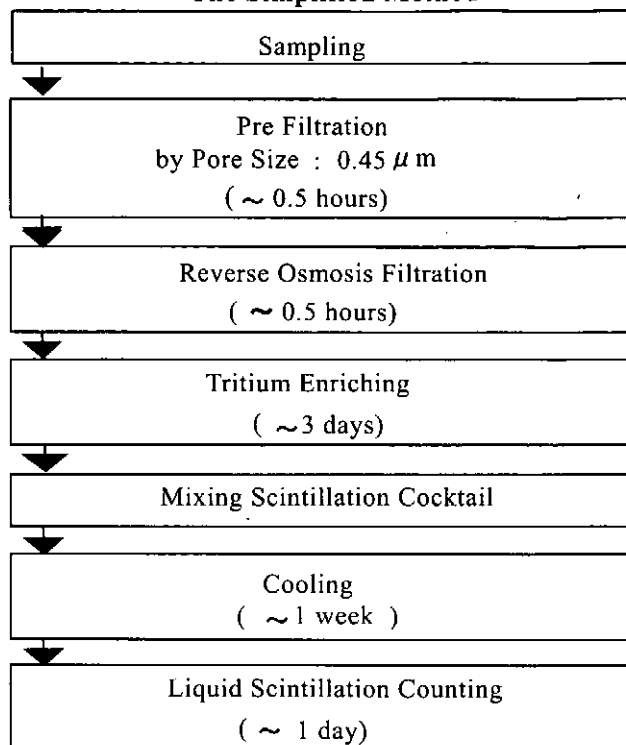


Fig.1 Flow chart of the simplified method.

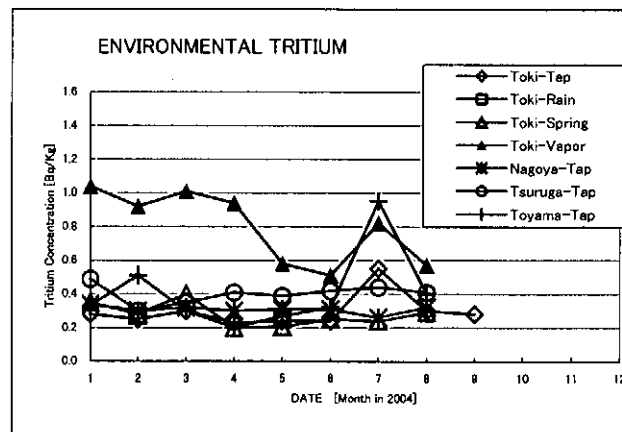


Fig.2 Result of the measurement.

### 3. Conclusion

The tritium concentration in the environmental water samples was successfully measured by the new measurement procedure.

### References

- [1] T. KOGANEZAWA et al., Radioisotopes, Vol.53, No.5 (2004) pp.277-285.
- [2] Y. SAKUMA et al., J. Radioanalytical and Nuclear Chemistry, Vol.255, No.2 (2003) pp.325-327