Progress Report on Radionuclide Metrology (2001-2003)

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Contribution to the 17th Meeting of CCRI(Section II), May 28 – 30, 2003

1. Research Activities

- **Standardization of Radionuclides :**
  - **Activity measurements of P-32, Tl-204 by CIEMAT/NIST method.**
  - **Activity measurement of Zn-65, Cr-51, I-131, Ir-192 by 4 π β-γ coincidence counting and digital coincidence counting techniques.**
  - **Activity measurement of I-125 by photon-photon coincidence counting.**
  - **Activity measurement of Pu-238 by α-γ coincidence counting.**
  - **Emission-rate measurement of Cl-36 area source (100 mm x 100 mm) by using a multi-wire proportional counting system.**
- **Development of equipments and facilities :**
  - **Radon calibration facility.**
    - **Characteristic evaluation of radon calibration chamber.**
    - **Development of pulse ionization chamber system for radon measurement.**
  - **TDCR (Triple to Double Coincidence Ratio) system.**
    - **Characteristic study of the system (H-3, P-32, Tl-204)**
  - **β(LS) - γ coincidence counting system. (In progress)**
    - **Construction of detection unit.**
    - **Comparison study with 4 π β(PPC)-γ coincidence counting**
  - **4 π β-γ(Ge) coincidence counting . (In progress)**
    - **Construction of detection unit. (HP Ge : 130 % Relative Efficiency)**

2. International Activities.

- **BIPM intercomparison : Pu-238, P-32, Tl-204, Zn-65, Ir-192, I-125**
- **APMP intercomparison : Cl-36 area source (Pilot lab. : NMIJ/Japan)**
- **Submission of KRISS CMCs to JCRB**

- **CMC review for other RMOs**
- **Participation of APMP/TCRI meeting**

3. Laboratory Sevices

- **Dissemination of radioactivity CRMs. (130 CRMs / y)**
- **Technical consultation to the industry.**
- **Calibration and test services for radiation detectors and radionuclides.**
- **Technical training for radiation workers.**

4. Future Work

- **Development of radioactivity CRMs for medical use and environmental activity measurements**.
- **Development of radon and radon progeny measurement techniques and calibration of radon detectors.**
- **Standardization of radionuclides (Cs-137, Ce-139, Sn-113, Mn-54, Sr-85, Co-56, Cs-134, Tc-99m, Hg-203, Na-22)**
- **Improvement of digital coincidence counting technique.**
- **Development of performance evaluation techniques for radiation detectors.**

5. Others

- **KRISS was reviewed about technical competence in the field of ionizing radiation by 3 experts from abroad in order to meet the technical requirements of ISO 17025. (May 14-17, 2002)**

6. Publications

- **H.Y. Hwang, T.S. Park and J.M. Lee, "Standardization of Co-57 by MCTS technique." Nucl. Instr. and Meth. 438, 340 (1999)**
- **Han-Yull Hwang Tae Soon Park, et.al., "Development of MCTS technique for 3-PM liquid scintillation counting". Applied Radiation and Isotopes *56,* 307-313 (2002)**
- **Tae Soon Park, Jong Man Lee and Han-Yull Hwang, "Standardization of Eu-152 and Y-88" Applied Radiation and Isotopes *56,* 275-280 (2002)**

- **HanYull Hwang, Ju Hee Lee, Yun Ho Cho, Jong In Byun, Tae Soon Kim, Tae Soon Park, Jong Man Lee, "Measurement of Accidental coincidences in β-γ Coincidence counting using Non-equal Dead Times." Nucl. Instr. and Meth., A488, 562-565 (2002)**