

IRA-METAS Report to the CCRI (II) 2008 meeting

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1. Introduction

The IRA-METAS laboratory is in charge of establishing, maintaining and diffusing the becquerel in Switzerland. The Swiss Federal Office of Metrology (METAS) has given this mandate to the University Institute for Radiation Physics (IRA) since 1993.

Besides ensuring that radioactivity measurements are accurate, reliable and traceable to the *Système International de Référence*, IRA's ionising radiation metrology group has other missions such as maintaining secondary radioactive and dose standards, and calibrating or verifying instruments for measuring ionising radiations (air-kerma, dose, activity).

2. Human resources

At the moment, IRA's radiation metrology group has seven staff in total: a group leader, three scientists, two laboratory assistants, and a physics laboratory assistant trainee.

3. Material resources

- Laboratory and equipments for quantitative handling of radioactive solutions (fume cupboards, systems for handling sources and dispensing solutions, very accurate electronic scales, etc.)
- Equipments for preparing gold-coated polyvinyl source supports
- Primary standardisation facilities
 - Equipments for $4\pi\beta\text{-}\gamma$ coincidence counting
 - Apparatus for $4\pi\gamma$ integral counting
 - Equipments for $4\pi\beta\text{-}4\pi\gamma$ coincidence counting
 - Systems for liquid scintillation counting (Efficiency tracing, CIEMAT-NIST, TDCR)
 - Equipments for measuring radon activity with the defined solid angle method
- Secondary measurement resources
 - High resolution gamma and X spectrometers
 - Radionuclide dose calibrators
 - Reference ionisation chamber

4. Quality Assurance

The primary laboratory at IRA runs a quality assurance system which is ISO17025 compliant.

5. Recent and ongoing projects

- Purification of Ho-166m commercial solutions and measurement of the half-life of Ho-166m.

- Distribution of Rn-222 standards obtained by 4π NaI(Tl) integral counting for the secondary laboratory of the Paul Scherrer Institute. This secondary laboratory runs a Radon chamber to calibrate radon measuring instruments.
- Testing and tuning of the TDCR counting system
- Validation of the 4πβ-4πγ counting system
- Characterisation of HPGe detectors using Monte Carlo simulations
- Organisation of national gamma spectrometry interlaboratory comparison (environmental sample of wood ashes)
- Organisation with the NPL of an interlaboratory comparison on uncertainty evaluation of coincidence measurements
- Distribution of reference solution for the calibration of dose rate calibrators (Cs-137, Co-60 and Co-57)
- Study of the measurements of nuclear medicine radionuclide using dose calibrators
- Determination of the activity concentration of F-18 solutions for commercial manufacturing quality assessment
- Diffusion of tracers for environmental studies (Po-209, Am-243, Pu-242)