

การเปรียบเทียบ CCRI(I)-S3 ของมาตรฐานสำหรับปริมาณรังสีดูดกลืนในน้ำของรังสีแกมมา ^{60}Co ที่ระดับการ
ประมวลผลปริมาณรังสี

Supplementary comparison CCRI(I)-S3 of standards for absorbed dose to water in ^{60}Co
gamma radiation at radiation processing dose levels

ช่วงเวลาดำเนินการ ปี พ.ศ. ไม่ระบุ

ผู้รับผิดชอบ นางสุมาลี นิลพฤกษ์

ตำแหน่ง นักนิวเคลียร์เคมีชำนาญการพิเศษ

Email: sumalee.n@oap.go.th

รายละเอียดสรุป

A supplementary comparison of standards for absorbed dose to water in ^{60}Co fields used for calibrations at radiation processing dose levels has been completed. Alanine dosimeters from the NIST and the NPL were used as transfer dosimeters and all participant irradiations were carried out in self-shielded irradiators. Irradiations were also carried out at the BIPM to allow direct comparison of dose ratios with the Key Comparison BIPM.RI(I)-K4. No significant difference was seen between the dose ratios obtained using the NPL and NIST alanine systems, no significant impact of mailing on dosimeter response was noted, and the adopted protocol limited any dose rate effects to the level of Type A uncertainties. The national standards of the participants are in agreement within the standard uncertainties, which are in the range from 1 to 2 parts in 10^2

Table 1: Summary of absorbed dose to water standards at participant laboratories

Institution	Country	Standard of absorbed dose to water in ^{60}Co reference field	Transfer to high-dose irradiator	Nominal dose rate (kGy h^{-1})	u (%)	Reference
CNEA-LDAD	Argentina	Graphite calorimeter (NPL)	Alanine dosimeter	6	1.7	ISO/ASTM 51607
NIM	China	Fricke dosimeter	No transfer [†]	1.5	0.9	Zong <i>et al</i> (1998)
DTU-Risø	Denmark	Graphite calorimeter (NPL)	Alanine dosimeter	5.4	1.4	Risø HDRL Quality Manual, (2021)
NIST	United States of America	Water calorimeter	Alanine dosimeter		1.1	NIST (2022)
NPL	United Kingdom	Graphite calorimeter	Alanine dosimeter	9.5	1.1	Kessler <i>et al</i> (2019). NPL (2022)
OAP	Thailand	Fricke Dosimeter	Alanine dosimeter	2.25	1.3	
BIPM		Primary standard ionization chamber	No transfer [†]	0.024	0.2	Kessler and Burns (2018) Burns and Kessler (2018)

[†]No irradiator employed; alanine transfer dosimeters irradiated directly in ^{60}Co reference field