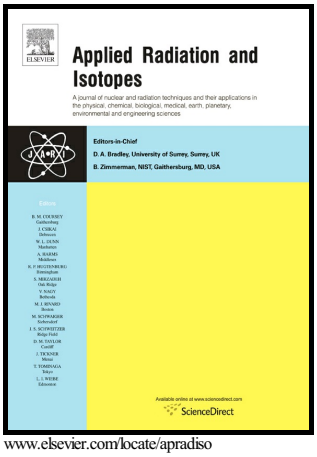

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Development of the Australian St for Germanium-68 by two Liquid Scintillation Counting methods

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Abstract

In response to the increasing application of ^{68}Ge/^{68}Ga and ^{68}Ga in nuclear medicine, an international comparison of activity measurement of ^{68}Ge in equilibrium with ^{68}Ga was organised. ANSTO standardised the comparison solution by the $4\pi(LS)\beta^{+}$-γ coincidence extrapolation and TDCR efficiency calculation methods, with excellent agreement between the two results. The primary standard was transferred to the ANSTO Secondary Standard Ionisation Chamber. Internationally traceable Australian Certified Reference Materials (ACRMs) of ^{68}Ge/^{68}Ga can now be prepared in various measurement geometries applied in nuclear medicine.

Keywords: Germanium-68; Gallium-68; liquid scintillation counting; $4\pi\beta^{+}$-γ coincidence; TDCR; traceability; nuclear medicine

1. Introduction

^{68}Ge is a pure electron-capture radionuclide, decaying with a half-life of $t_{½}$ = 270.95 (26) days to the ground state of ^{68}Ga ($t_{½}$ = 67.83 (20) minutes) (Fig. 1, Bé et al., 2013). ^{68}Ga

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