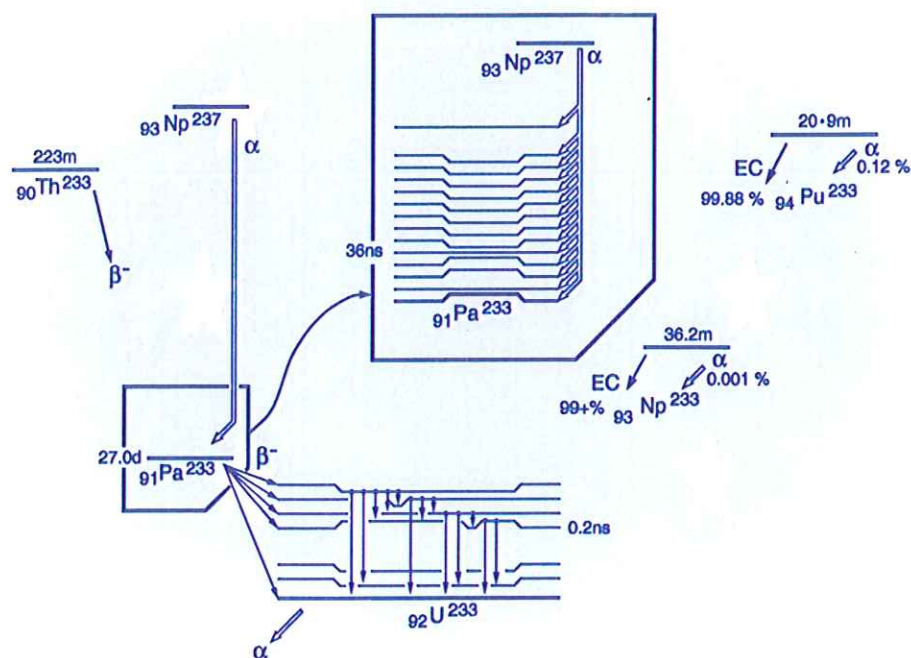


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International Committee for Radionuclide Metrology

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LABORATORY National Institute of Standards and Technology

NAMES R. Collé

ACTIVITY Development of a dual-compensated cryogenic microcalorimeter for radioactivity standardizations

IN PROGRESS Efforts are underway by our laboratory to develop a microcalorimeter that can be routinely used for radioactivity standardizations of nuclides that decay by pure beta emission or by low-Z electron capture. The prototype calorimeter is unique, and was initially designed and constructed by Science Research Laboratories, Inc. (Cambridge, MA USA) under a NIST-sponsored contract. The calorimeter has been undergoing extensive evaluations and design modifications. Numerous preliminary measurements have been performed using ^{90}Sr - ^{90}Y brachytherapy seeds as well as with an internal calibration heater whose input power can be varied.

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ACTIVITY Activity characterization of pure-beta-emitting brachytherapy sources

RESULTS A generalized approach for characterizing the activity content of sealed β -emitting sources has been developed, and was employed to establish NIST-based activity standardizations for three different types of intravascular brachytherapy sources, viz., (i) a TiNi-encapsulated ^{32}P seed having a highly-inert polymeric core; (ii) a stainless-steel-jacketed ^{90}Sr - ^{90}Y source with a highly-refractory ceramic-like matrix; and (iii) a "hot wall" balloon catheter source that consists of a thin film of ^{32}P enveloped between the polyethylene balloon walls.

PUBLICATIONS

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