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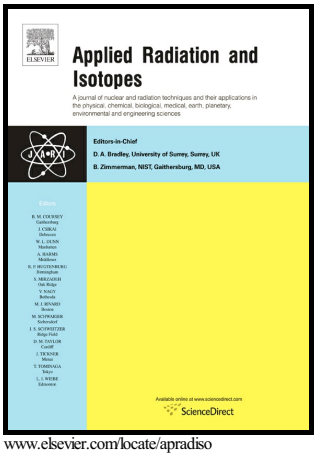

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The Half-life of ^{129}I

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Abstract

The radionuclide ^{129}I is a long-lived fission product that decays to ^{129}Xe by beta-particle emission. It is an important tracer in geological and biological processes and is considered one of the most important radionuclides to be assessed in studies of global circulation. It is also one of the major contributors to radiation dose from nuclear waste in a deep geological repository. Its half-life has been obtained by a combination of activity and mass concentration measurements in the frame of a cooperation of 6 European metrology institutes. The value obtained for the half-life of ^{129}I is 16.14 (12) × 10^6 a, in good agreement with recommended data but with a significant improvement in the uncertainty.

Keywords ^{129}I; half-life; standardization; mass spectrometry; activity measurements

1 Introduction

The radionuclide ^{129}I, a long-lived fission product, decays to ^{129}Xe via two beta branches, one containing 99.5% of all disintegrations to an excited level at 39.578 keV in the daughter nuclide and a second one with 0.5% populating the ground level. The