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Developments of counting rates correction method and its use in the 4πβ – γ coincidence counting

4πβ – γ coincidence counting has been widely
applied in the absolute radioactivity measurement for its high
accuracy and enabling measurement of most radionuclides without any specific values being assumed. The
4πβ – γ method
has a lot of variants according to the radionuclide and detector
types, among which the digital coincidence counting (DCC) is
quite outstanding. the DCC routine generally consist of five
sections: the front-end electronics section, the digitalizer section,
the coincidence logic section the counting rate correction and
the efficiency extrapolation section. Generally, the formulae used
in the counting rate correction section is derivated according
to specific application scenatios, which lead to the formulae
quite complex and can not be used widely. In this study, a
improved method is proposed based of the formulae put forward
by Campion in 1959 and the living time method. The adapted
method was applied in the DCC software used in the National
Institute of Metrology (NIM) and was validated by comparing the
results obtained by the previously validated method. The results
indicate that the DCC software appiled the developed method
had a tolerable error. The method is promising in the filed of
radionuclide calibration for its generality and reliability

Minioral

Yes

IEEE Member

No

Are you a student?

Yes

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