

NEW EVALUATION OF DECAY AND RADIATION CHARACTERISTICS OF ^{198}Au

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The isotope ^{198}Au is widely used in radiotherapy, medical diagnostics and activation analysis. Therefore high-quality evaluated decay data are merited for this radionuclide.

This ^{198}Au decay data evaluation has been carried out within the Decay Data Evaluation Project (DDEP) [1]. The previous DDEP evaluation for ^{198}Au was done by E. Schönfeld and R. Dersch in 1998 with minor update in 2004 [2]. The current evaluation takes into account experimental data and other information (compilations, analyses, corrections) published up to May 2014.

The ^{198}Au half-life of 2.6943(3) days was evaluated in this work taking into account the new measurements and corrections of 2005–2014. The recommended value of the half-life was obtained as the weighted average of 26 experimental values published since 1953.

The energies of β^- transitions of ^{198}Au were obtained using the $Q(\beta^-)$ value of 1372.8 (5) keV from the new mass tables [3] and the ^{198}Hg level energies adopted from [4]. The probabilities of β^- -transitions P_{β^-} were deduced from the gamma ray transition probabilities ($P(\gamma+\text{ce})$) balance at each level of ^{198}Hg .

Gamma ray transition probabilities were obtained from their γ ray emission probabilities and the total internal conversion coefficients interpolated with the BrIcc computer program [5] from the tables of Band *et al.* [6].

The recommended γ ray emission probabilities (P_γ) in decay of ^{198}Au given below were deduced using averaged measured relative γ ray intensities. The normalization factor (0.9562(6)%) to convert the adopted relative gamma ray intensities to absolute emission probabilities was obtained from the gamma ray transition intensity balance at the ground state of ^{198}Hg .

Energy, keV	P_γ , %
411.80205(17)	95.62(6)
675.8836(7)	0.804(5)
1087.6842(7)	0.1591(21)

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