

The half Life of ^{10}C

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We have previously reported in detail on progress in our measurement of the half-life of ^{10}C [1]. This work has now been completed and a paper describing the experiment has been published [2]. We determined the half-life to be 19.310(4) s, a result with 0.02% precision, which is a factor of four improvement over the best previous result. When our result is averaged with all previous results, the resulting half-life is 19.308(4) s and, with the other properties for the superallowed decay of ^{10}C taken from our 2005 survey [3], the corresponding ft value becomes 3042.4(43) s. This represents a reduction in uncertainty from the previous ft value [3], 3039.5(47) s, now leaving the branching ratio and, to a lesser extent, the Q_{EC} value as the major contributors to the overall uncertainty.

It is interesting to note that our new measurement of the half life increases the ft value for ^{10}C as well as reducing its uncertainty. Naturally, its corrected $\mathcal{F}t$ value is increased as well, to 3077.4(46) s. This is slightly above the overall average of all well-known superallowed transitions [3] and, if this tendency for ^{10}C is re-enforced by branching-ratio and Q_{EC} -value measurements with improved precision, it could indicate the presence of a small contribution from a scalar current. Clearly, high priority should be attached to the re-measurement of these two quantities with improved precision.

- [1] V. E. Iacob *et al.*, *Progress in Research*, Cyclotron Institute, Texas A&M University (2005-2006), p. I-28; *Progress in Research*, Cyclotron Institute, Texas A&M University (2006-2007), p. I-55.
- [2] V. E. Iacob, J. C. Hardy, V. Golovko, J. Goodwin, N. Nica, H. I. Park, L. Trache, and R. E. Tribble, *Phys. Rev. C* **77**, 045501 (2008).
- [3] J. C. Hardy and I. S. Towner, *Phys. Rev. C* **71**, 055501 (2005).