

$^{165}\text{Re}$   $\alpha$  decay [1999Po09](#),[2005Sc22](#)

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich	NDS 112,2497 (2011)	1-Jun-2011

Parent:  $^{165}\text{Re}$ :  $E=0$ ;  $J^\pi=(1/2^+)$ ;  $Q(\alpha)=5657$  SY;  $\% \alpha$  decay=?

$^{165}\text{Re}-J^\pi$ : Member of a sequence of (presumably) favored  $\alpha$  transitions headed by the  $1/2^+$  level in  $^{177}\text{Tl}$  ([1999Po09](#)).

$^{165}\text{Re}-T_{1/2}$ : [2005Sc22](#) report  $T_{1/2}=2.61$  s  $+14-13$  for this level. However, a subsequent study (D. O'Donnell et al., (to be published); D.T. Joss, R.D. Page and D. O'Donnell, (private communication, June, 2011)) by some of the same authors as [2005Sc22](#) does not confirm this result. The evaluator assumes that the  $T_{1/2}$  value for this level is unknown at present.

$^{165}\text{Re}-Q(\alpha)$ : From [2009AuZZ](#). [2005Sc22](#) report  $E\alpha=5493$  6 which implies  $Q(\alpha)=5629$  6. However, a subsequent study (O'Donnell et al., see the comment on  $T_{1/2}$  for this level) by some of the same authors as [2005Sc22](#) does not confirm this result. The evaluator assumes that the decay properties of this level are not known at this time.

Additional information 1.

[1999Po09](#):  $^{165}\text{Re}$  produced As  $\alpha$  decay product of  $^{177}\text{Tl}$ , produced via  $^{102}\text{Pd}(^{78}\text{Kr},p2n)$ ,  $E(^{78}\text{Kr})=370$  MeV. Reaction products separated In the ANL fragment mass analyzer and studied using a parallel grid avalanche counter and a double-sided Si-strip detector.

[2005Sc22](#):  $^{165}\text{Re}$  produced In the decay of  $^{169}\text{Ir}$ , produced via  $^{112}\text{Sn}(^{58}\text{Ni},p2n)$ ,  $E(^{58}\text{Ni})=266$  MeV. Reaction products separated In the RITU separator and studied using a double-sided Si-strip detector and the JUROGAM array. Recoil-decay tagging.

A 2.2-s activity ( $E_\alpha=5495$  10) was originally assigned ([1978Sc26](#)) to  $^{166}\text{Re}$ , but subsequently ([1984Sc06](#)) was assigned to  $^{165}\text{Re}$ .

The similarity in this energy with that of [2005Sc22](#) might suggest that this activity may be assigned to the decay of the  $^{165}\text{Re}$  g.s. However, the data from [2005Sc22](#) have not been confirmed in a subsequent study by some of the same authors. (See the comment on the  $T_{1/2}$  and  $Q(\alpha)$  values for the  $^{165}\text{Re}$  g.s.) Thus, the origin of this 2.2-s activity remains an open question.

 $^{161}\text{Ta}$  Levels

E(level)	$J^\pi$	Comments
0	(1/2 <sup>+</sup> )	It is assumed here that this level is fed in the decay of the $^{165}\text{Re}$ g.s., but this is an open question at present.