^{165}Re α decay (2.32 s)

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

Parent: ^{165}Re: E=48 *26*; J^π=(11/2$^-$); $T_{1/2}$=2.32 s *9*; Q(α)=5657 *SY*; %α decay=13 *3*

^{165}Re-E: From 1999Po09, based on energy differences of the α transitions from the 11/2$^-$ states and the 1/2$^+$ states In the α decays from the sequence of nuclides headed by ^{177}Tl.

^{165}Re-$T_{1/2}$: Weighted average of: 2.37 s *+10−9* (2005Sc22); 1.9 s *3* (1996Pa01); and 2.4 s *6* (1981Ho10). Other: 2.2 s *4* (1984Sc06; 1978Sc26), but the evaluator has not adopted the assignment of this activity to this decay.

^{165}Re-J^π: Member of a sequence of (presumably) favored α transitions headed by the (11/2$^-$) level In ^{177}Tl (1999Po09).

^{165}Re-Q(α): From 2009AuZZ. See the comment on the Q(g.s.) value for the ^{165}Re g.s.

^{165}Re-%α decay: from 1981Ho10. 1984Al36 suggest that ^{165}Re should decay by proton emission as well as α and $\varepsilon+\beta^+$ decay.

Additional information 1.

Nuclide produced In a variety of heavy-ion-induced reactions on a variety of targets. Most studies utilized recoil mass separation and double-sided Si-strip detectors to study the decay chains of the respective nuclides. Data are primarily from 2005Sc22, 1999Po09, 1996Pa01, 1981Ho10.

A 2.2-s activity (E_α=5495 *10*) was originally assigned (1978Sc26) to ^{166}Re, but was subsequently (1984Sc06) assigned to ^{165}Re. The similarity of this energy with that of 2005Sc22 might suggest that this activity may be assigned to the decay of the ^{165}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(α) values for the ^{165}Re g.s.) Thus, the origin of this 2.2-s activity remains an open question.

1999Po09: ^{165}Re produced As α decay product of ^{177}Tl, produced via ^{102}Pd(^{78}Kr,p2n), E(^{78}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}Re produced In the decay of ^{169}Ir, produced via ^{112}Sn(^{58}Ni,p2n), E(^{58}Ni)=266 MeV. Reaction products separated In the RITU separator and studied using a double-sided Si-strip detector and the JUROGRAM array. Recoil-decay tagging.

^{161}Ta Levels

E(level)	J^π	Comments
x	(11/2$^-$)	J^π: fed by an α transition from an (11/2$^-$) state In ^{165}Re.

α radiations

Eα	E(level)	Iα[†]	Comments
5518 *3*	x	100	Eα: weighted average of: 5520 *5* (2005Sc22); 5518 *5* (1996Pa01); and 5506 *10* (1981Ho10). Other: 5495 *10* (1978Sc26,1984Sc06), but the evaluator has left open the question As to which ^{161}Ta state this activity belongs.

[†] For absolute intensity per 100 decays, multiply by 0.13 *3*.