

Adopted Levels

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 156, 70 (2019)	31-Jan-2019

$Q(\beta^-) = -4490$ SY; $S(n) = 7250$ SY; $S(p) = 4150$ SY; $Q(\alpha) = 8800$ SY [2017Wa10](#)

Estimated uncertainties ([2017Wa10](#)): $\Delta Q(\beta^-) = 290$, $\Delta S(n) = 270$, $\Delta S(p) = 330$, $\Delta Q(\alpha) = 100$.

$S(2n) = 13310 \pm 370$, $S(2p) = 7040 \pm 440$ (syst, [2017Wa10](#)).

[2006Dv01](#), [2008Dv02](#): ^{266}Sg produced as α -daughter of ^{270}Hs , which was formed in $^{248}\text{Cm}(^{26}\text{Mg}, 4n)$, $E = 193, 185$ MeV reaction at GSI, and assignment to the isotope made through the observation of four correlated (α -SF) decay chains in [2006Dv01](#), and two in [2008Dv02](#) which were attributed to ^{270}Hs on the basis of α -SF correlations. These studies negated the discovery of ^{266}Sg , published in several articles ([2003Tu05](#), [2003Du27](#), [2002Du21](#), [2001Hu22](#), [1998Tu01](#), [1997Sc48](#), [1997Sc49](#) from the GSI group; and [1995Og02](#), [1994La22](#), [1994Lo27](#), [1994La22](#), [1994Og04](#) from the Dubna-LLNL group), and assigned the events in these earlier studies to ^{269}Hs decaying by α decay to ^{265}Sg , which also decays partially by α . See ^{270}Hs Adopted Levels for history of six correlated decay chains observed in the above two works.

[2013Og03](#): ^{266}Sg produced as α -daughter of ^{270}Hs isotope, which was formed in $^{226}\text{Ra}(^{48}\text{Ca}, 4n)$ reaction $E(^{48}\text{Ca}) = 229, 234, 241$ MeV at Dubna. This study confirmed conclusions of the GSI experiments by [2006Dv01](#) and [2008Dv02](#). See ^{270}Hs Adopted Levels for history of six correlated decay chains observed by [2013Og03](#).

Earlier studies where either direct production of ^{266}Sg or through the α decay of ^{270}Hs was claimed in the first experiments at Dubna, and later at GSI, but later these activities were reassigned to ^{265}Sg or ^{269}Hs by [2006Dv01](#) and [2008Dv02](#) at GSI, and confirmed in [2013Og03](#) at Dubna. The following studies are listed here only from the historical perspective of search for ^{266}Sg during 1994-2004 at Dubna and GSI.

[1994La22](#) (also [1994Lo27](#), [1994Og04](#), [1995Og02](#)): $^{248}\text{Cm}(^{22}\text{Ne}, 4n)$, $E = 116, 121$ MeV at Dubna. Six α -SF correlated events were reported. The α -decay half-life of ^{266}Sg was suggested as 10-30 s, with α decay as the primary mode ($\% \alpha \geq 50$), $E\alpha = 8.63$ MeV 5.

[1997Sc48](#), [1997Sc49](#), [1998Tu01](#): $^{248}\text{Cm}(^{22}\text{Ne}, 4n)$, $E = 121$ MeV at GSI using UNILAC accelerator and On-Line Gas chemistry Apparatus (OLGA). Four α -SF decay chains were assigned to the decay of ^{266}Sg . The α -decay half-life of ^{266}Sg was reported as 21 s $+20-12$, with $E\alpha = 8.77$ MeV 4, and the decay of ^{266}Sg through α and SF modes.

[2001Hu22](#): chemistry-related experiments at GSI using the same reaction as in [1998Tu01](#). Two decay chains reported with α -decay half-life of 21.1 s and $E\alpha = 8.66$ and 8.70 MeV.

[2002Du21](#), [2003Du27](#), [2003Tu05](#) (also [2003Kr24](#) review): two α - α -SF correlated decay chains ($^{270}\text{Hs} \rightarrow ^{266}\text{Sg} \rightarrow ^{262}\text{Rf}$) were reported using the $^{248}\text{Cm}(^{26}\text{Mg}, 4n)$, $E = 143.7-146.8$ MeV reaction and chemistry techniques at GSI.

[2004Vo24](#): this experiment reports mainly the chemistry of $Z = 108$ (Hs) element through the formation of ^{269}Hs or ^{270}Hs in $^{248}\text{Cm}(^{26}\text{Mg}, 4n)$ at GSI. Three α - α -SF correlated events were assigned to the decay of ^{269}Hs or ^{270}Hs .

For theoretical studies, consult Nuclear Science References (NSR) database at NNDC, BNL for 105 primary references dealing with the half-lives and other aspects of nuclear structure in this mass region.

 ^{266}Sg LevelsCross Reference (XREF) Flags

A ^{270}Hs α decay (7.6 s)

Adopted Levels (continued)

 ^{266}Sg Levels (continued)

<u>E(level)</u>	<u>J^{π}</u>	<u>T_{1/2}</u>	<u>XREF</u>	<u>Comments</u>
0	0 ⁺	0.34 s +19-9	A	%SF=100 Only the SF decay mode observed by 2013Og03 (Dubna group), 2008Dv02 and 2006Dv01 (GSI group). See comment for T _{1/2} . T _{1/2} : weighted average of 0.28 s +19-8 (2013Og03) and 0.36 s +25-10 (2008Dv02) for SF decay of ^{266}Sg . In several earlier publications (2003Tu05 , 2003Du27 , 2002Du21 , 2001Hu22 , 1998Tu01 , 1997Sc48 , 1997Sc49 from the GSI group; and 1995Og02 , 1994La22 , 1994Lo27 , 1994La22 , 1994Og04 from the Dubna-LLNL group), α decay mode was also reported, and the half-life for α decay was reported as ≈ 21 s, but 2006Dv01 reassigned the events observed in all the earlier studies listed above to ^{265}Sg .