Adopted Levels

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

$S(n)=8230$ *60*; $S(p)=1980$ *SY*; $Q(\alpha)=11117$ *28*   2017Wa10

Estimated uncertainty=470 for $S(p)$ (2017Wa10).

$S(2n)=15110$ *310*, $S(2p)=2730$ *290*, $Q(\varepsilon p)=2830$ *130* (syst, 2017Wa10).

2001Ho06 (also 2002Ho11, 2011Ac01, 2015Mu16 review): ^{270}Ds produced in ^{207}Pb(^{64}Ni,n),E=317 MeV using UNILAC accelerator facility and SHIP separator at GSI. Experiments performed under an international collaboration between laboratories in Germany, Slovakia, Poland, and Russia. Of the eight correlated events detected, six involved EVR-$\alpha1-\alpha2$-SF correlations, and two EVR-$\alpha2$-SF. Two groups for the six α-decays assigned to ^{270}Ds as follows: events #1, #2, and #3 belonged to the g.s., and events #4, #5, and #6 to states originating from a K-isomer (as in the case of the longest half-life in event #6) or γ-decay.

History of correlated events observed by 2001Ho06:

Event #1:

$E_{\alpha1}=10987$ keV *90*, $\Delta t_1=0.07$ ms, assigned to ^{270}Ds.

$E_{\alpha2}=4168$ keV (escaped), $\Delta t_2=0.43$ ms, assigned to ^{266}Hs.

$E_{SF}=189$ MeV, $\Delta t_3=11.02$ ms, assigned to ^{262}Sg (SF decay).

Event #2:

$E_{\alpha1}=11075$ keV *90*, $\Delta t_1=0.18$ ms, assigned to ^{270}Ds.

$E_{\alpha2}=10196$ keV *20*, $\Delta t_2=0.87$ ms, assigned to ^{266}Hs.

$E_{SF}=193$ MeV, $\Delta t_3=10.26$ ms, assigned to ^{262}Sg (SF decay).

Event #3:

$E_{\alpha1}=1925$ keV (escaped), $\Delta t_1=0.20$ ms, assigned to ^{270}Ds.

$E_{\alpha2}=10173$ keV *90*, $\Delta t_2=2.79$ ms, assigned to ^{266}Hs.

$E_{SF}=164$ MeV, $\Delta t_3=8.84$ ms, assigned to ^{262}Sg (SF decay).

Event #4:

$E_{\alpha1}=11151$ keV *20*, $\Delta t_1=2.00$ ms, assigned to ^{270m}Ds.

$E_{\alpha2}=10171$ keV *20*, $\Delta t_2=18.22$ ms, assigned to ^{266}Hs.

$E_{SF}=199$ MeV, $\Delta t_3=13.06$ ms, assigned to ^{262}Sg (SF decay).

Event #5:

$E_{\alpha1}=12147$ keV *50*, $\Delta t_1=10.35$ ms, assigned to ^{270m}Ds.

$E_{\alpha2}=10281$ keV *90*, $\Delta t_2=9.63$ ms, assigned to ^{266}Hs.

$E_{SF}=215$ MeV, $\Delta t_3=7.77$ ms, assigned to ^{262}Sg (SF decay).

Event #6:

$E_{\alpha1}=10954$ keV *20*, $\Delta t_1=17.71$ ms, assigned to ^{270m}Ds.

$E_{\alpha2}=10180$ keV *20*, $\Delta t_2=0.34$ ms, assigned to ^{266}Hs.

$E_{SF}=190$ MeV, $\Delta t_3=3.98$ ms, assigned to ^{262}Sg (SF decay).

Event #7:

$E_{\alpha2}=578$ keV (escaped), $\Delta t_2=0.46$ ms, assigned to ^{266}Hs.

$E_{SF}=227$ MeV, $\Delta t_3=2.00$ ms, assigned to ^{262}Sg (SF decay).

Event #8:

$E_{\alpha2}=10306$ keV *90*, $\Delta t_2=5.40$ ms, assigned to ^{266}Hs.

$E_{SF}=177$ MeV, $\Delta t_3=33.91$ ms, assigned to ^{262}Sg (SF decay).

2012Ac04: 25 additional decay chains were observed at GSI using the same reaction and SHIP separator as in 2001Ho06. These chains were of three different types of correlations: EVR-α-α-SF, EVR-α-SF, and EVR-α-α-α-SF. Complete analysis of these data

Adopted **Levels** (continued)

are yet to be published as mentioned in author's review articles 2017Ac02 and 2015Ac04. Revised half-life of ^{270}Ds α decay was deduced in this work. These experiments are also briefly described by D. Ackermann et al., in GSI Annual Scientific reports (GSI-2010, p200 (published in 2011), and GSI-2011, p208 (published in 2012)).

For theoretical studies, consult Nuclear Science References (NSR) database at NNDC, BNL for 98 primary references dealing with the half-lives and other aspects of nuclear structure in this mass region.

^{270}Ds Levels

E(level)	J^{π}	$T_{1/2}$	Comments
0	0^+	0.20 ms $+7-4$	%$\alpha\approx$100; %SF=? Only the α decay observed. No fission branch observed. From theoretical calculations, 2001Ho06 estimated %SF<0.2. E(level): the observed α activity is assumed to correspond to the ground state of ^{270}Ds. $T_{1/2}$: from 2012Ac04. Other: 100 μs $+140-40$ (2001Ho06, from the three events 1, 2 and 3 assigned to the ^{270}Ds g.s.). 2011Ac01 mention experimental $T_{1/2}$(SF mode)>0.2 ms. Eα=11.03 MeV 5 (2001Ho06) from ^{270}Ds α decay. Preliminary Q(α)=11.25 MeV (2012Ac04), fully analyzed results of this work are not yet available.
$\approx$1.13$\times$10^3	$(9^-,10^-)$	3.9 ms $+15-8$	%$\alpha\approx$70; %IT$\approx$30 (2001Ho06) E(level): from 2017Ac02 and 2015Ac04 review articles, based on the assumption that the observed 12.15-MeV α in 2001Ho06 feeds a level in ^{266}Hs very near the g.s. (2011Ac01,2012Ac04). Others: 1040 keV from Fig. 4 in 2012Ac04; 1390 keV 60 (2017Au03, NUBASE-2016, from analysis of alpha energies); 1348 keV 66 (2015Ko14, K-isomer evaluation). J^{π}: from 2011Ac01 and 2015Ac04, based on theoretical calculations, and interpretation as a high-spin K-isomer with configuration= ν11/2[725]$\otimes\nu$7/2[613] for J^{π}=9$^-$ or ν11/2[725]$\otimes\nu$9/2[615] for 10$^-$. 2017Au03 and 2015Ko14 give (10$^-$). $T_{1/2}$: from Fig. 4 in 2012Ac04 (somewhat preliminary value, but probably includes more decay chains, from their work as well as from 2001Ho06). Other: 6.0 ms $+82-22$ (2001Ho06, unweighted average for events 4, 5 and 6 attributed to the isomeric state). Eα=10.95 MeV 2, 11.15 MeV 2 and 12.15 MeV 5 (2001Ho06) from α decay of the isomer in ^{270}Ds to three different levels in ^{266}Hs. Other: Eα=10.97, 11.20 and 12.11 MeV (2012Ac04, preliminary values from Fig. 4 in 2012Ac04).