

Adopted Levels

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	B. Singh	ENSDF	15-Mar-2016

S(n)=6960 CA; S(p)=520 SY; Q(α)=10400 50 [2012Wa38,1997Mo25](#)

S(n) from theory ([1997Mo25](#)); S(p) and Q(α) from [2012Wa38](#).

Estimated uncertainty=270 for S(p) ([2012Wa38](#)).

S(2n)=15670 (theory,[1997Mo25](#)). S(2p)=3050 390, Q(ϵ p)=4040 250 (syst,[2012Wa38](#)).

[1983OgZX](#): ²⁶⁰Bh produced in ²⁰⁶Pb(⁵⁵Mn,n),E=310 MeV at JINR; parent of ²⁵⁶Db; measured E α .

[2008Ne01](#): production of ²⁶⁰Bh in ²⁰⁹Bi(⁵²Cr,n) reaction; ²⁵⁶Db, ²⁵²Lr and ²⁴⁸Md through successive α -decay chain, and ²⁵⁶Rf and ²⁴⁸Fm through ϵ decays. E(⁵²Cr¹²⁺)=257.0 MeV beam provided by 88-Inch Cyclotron at LBNL. The nuclei were analyzed using Berkeley Gas-Filled Separator. Detectors: A focal plan Si strip detector and a Si-strip detector array, with a resolution of FWHM=55 keV.

Following eight correlated decay chains were detected by [2008Ne01](#).

Decay chain #1: Evaporation residues at 18.0 MeV

E $_{\alpha 1}$ =10.24 MeV	t $_1$ =0.044 s	-assigned to ²⁶⁰ Bh	decay;	²⁶⁰ Bh	decays by α to ²⁵⁶ Db	followed
by ϵ decay to ²⁵⁶ Rf.	The ϵ decay of ²⁵⁶ Db	to ²⁵⁶ Rf	is expected but not seen			
E $_{SF}$ =148.0 MeV	t $_{SF}$ =0.648 s	-assigned to ²⁵⁶ Rf	decay;	²⁵⁶ Rf	decays by SF mode.	

Decay chain #2: Evaporation residues at 14.9 MeV

E $_{\alpha 1}$ =10.17 MeV	t $_1$ =0.003 s	-assigned to ²⁶⁰ Bh	decay			
E $_{\alpha 2}$ =9.03 MeV	t $_2$ =0.380 s	-assigned to ²⁵⁶ Db	decay			
E $_{\alpha 3}$ =8.82 MeV	t $_3$ =0.43 s	-assigned to ²⁵² Lr	decay			
E $_{\alpha 4}$ =8.26 MeV	t $_4$ =32.460 s	-assigned to ²⁴⁸ Md	decay;	²⁴⁸ Md	decays by α to ²⁴⁴ Es	

Decay chain #3: Evaporation residues at 15.2 MeV

E $_{\alpha 1}$ =10.17 MeV	t $_1$ =0.135 s	-assigned to ²⁶⁰ Bh	decay			
E $_{\alpha 2}$ =9.06 MeV	t $_2$ =0.316 s	-assigned to ²⁵⁶ Db	decay			
E $_{\alpha 3}$ =8.99 MeV	t $_3$ =1.394 s	-assigned to ²⁵² Lr	decay;	²⁵² Lr	decays by α to ²⁴⁸ Md	which
decays by ϵ to ²⁴⁸ Fm.	The ϵ decay of ²⁴⁸ Md	to ²⁴⁸ Fm	is expected but not observed.			
E $_{\alpha 4}$ =7.85 MeV	t $_4$ =59.642 s	-assigned to ²⁴⁸ Fm	decay;	²⁴⁸ Fm	decays by α to ²⁴⁴ Cf	

Decay chain #4: Evaporation residues at 16.5 MeV

E $_{\alpha 1}$ =Escape,0.77 MeV	t $_1$ =0.045 s	-assigned to ²⁶⁰ Bh	decay			
E $_{\alpha 2}$ =9.02 MeV	t $_2$ =0.563 s	-assigned to ²⁵⁶ Db	decay			
E $_{\alpha 3}$ =9.02 MeV	t $_3$ =0.119 s	-assigned to ²⁵² Lr	decay;	²⁵² Lr	decays by α to ²⁴⁸ Md	

Decay chain #5: Evaporation residues at 16.5 MeV

E $_{\alpha 1}$ =10.08 MeV	t $_1$ =0.050 s	-assigned to ²⁶⁰ Bh	decay			
E $_{\alpha 2}$ =9.19 MeV	t $_2$ =0.761 s	-assigned to ²⁵⁶ Db	decay			
E $_{\alpha 3}$ =9.61 MeV	t $_3$ =0.195 s	-assigned to ²⁵² Lr	decay			
E $_{\alpha 4}$ =8.46 MeV	t $_4$ =1.672 s	-assigned to ²⁴⁸ Md	decay;	²⁴⁸ Md	decays by α to ²⁴⁴ Es	

Decay chain #6: Evaporation residues at 17.9 MeV

E $_{\alpha 1}$ =10.19 MeV	t $_1$ =0.015 s	-assigned to ²⁶⁰ Bh	decay			
E $_{\alpha 2}$ =9.04 MeV	t $_2$ =4.600 s	-assigned to ²⁵⁶ Db	decay			
E $_{\alpha 3}$ =Escape,2.38 MeV	t $_3$ =0.540 s	-assigned to ²⁵² Lr	decay			
E $_{\alpha 4}$ =8.13 MeV	t $_4$ =15.783 s	-assigned to ²⁴⁸ Md	decay;	²⁴⁸ Md	decays by α to ²⁴⁴ Es	

Decay chain #7: Evaporation residues at 18.1 MeV

E $_{\alpha 1}$ =10.13 MeV	t $_1$ =0.044 s	-assigned to ²⁶⁰ Bh	decay;	²⁶⁰ Bh	decays by α to ²⁵⁶ Db	followed
by ϵ decay to ²⁵⁶ Rf.	The ϵ decay of ²⁵⁶ Db	to ²⁵⁶ Rf	is expected but not seen			
E $_{SF}$ =174.3 MeV	t $_{SF}$ =1.120 s	-assigned to ²⁵⁶ Rf	decay;	²⁵⁶ Rf	decays by SF	

Decay chain #8: Evaporation residues at 16.3 MeV

E $_{\alpha 1}$ =10.03 MeV	t $_1$ =0.037 s	-assigned to ²⁶⁰ Bh	decay			
E $_{\alpha 2}$ =9.03 MeV	t $_2$ =4.323 s	-assigned to ²⁵⁶ Db	decay			

$E_{\alpha 3} = \text{Escape}, 3.31$ MeV $t_3 = 0.065$ s -assigned to ^{252}Lr decay; ^{252}Lr decays by α to ^{248}Md followed by ε decay to ^{248}Fm . The ε decay of ^{248}Fm is expected but not observed.
 $E_{\alpha 4} = 8.06$ MeV $t_4 = 25.171$ s -assigned to ^{248}Fm decay; ^{248}Fm decays by α to ^{244}Cf .

 ^{260}Bh Levels

<u>E(level)</u>	<u>$T_{1/2}$</u>	<u>Comments</u>
0	35 ms +19-9	<p>$\% \alpha \approx 100$; $\% \varepsilon < 18$; $\% \text{SF} < 18$ $\% \text{SF} + \% \varepsilon < 18$ (2008Ne01). Only α decay of ^{260}Bh has been observed by 2008Ne01. An upper limit is proposed by 2008Ne01 for SF and ε decay modes. Mainly the α decay mode was also reported by 1983OgZX. E(level): the 35-ms activity is assumed to belong to the g.s. of ^{260}Bh. Seven α events are observed at: 10.24, 10.17, 10.17, 10.08, 10.19, 10.13 and 10.03 MeV (2008Ne01), some of which possibly feed excited states in ^{256}Db. $T_{1/2}$: from (implants)α-correlated events (2008Ne01). No half-life was reported by 1983OgZX. Theoretical calculations (1997Mo25) predict $T_{1/2} = 0.025$ s for α decay and 10.22 s for ε decay, consistent with dominant α decay mode in experimental works of 2008Ne01 and 1983OgZX. J^π: in theoretical calculations by 1997Mo25, $5/2^-$ proton and $11/2^-$ neutron orbitals were specified, which would suggest $J^\pi = 3$ to 8 with positive parity. No direct SF decay of ^{260}Bh or from ^{260}Sg (possible ε decay of ^{260}Bh) was observed. Only a limit of $< 18\%$ is assigned at 84% confidence level for SF and ε decay branches. $T_{1/2}$: from 2008Ne01. Production cross section = 59 pb +29-20 (2008Ne01). Additional information 1.</p>