

Adopted Levels

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 141, 327 (2017)	22-Mar-2017

S(n)=7170 SY; S(p)=1120 SY; Q(α)=9340 30 [2017Wa10](#)

Estimated uncertainties ([2017Wa10](#)): 430 for S(n), 270 for S(p).

S(2n)=16140 (theory,1997M025). S(2p)=3950 390, Q(εp)=3260 240 (syst,[2017Wa10](#)).

Theoretical calculations: consult the Nuclear Science References (NSR) database for about 27 theory references.

[1983OgZX](#): ²⁵⁶Db claimed to have been observed as an SF activity in ²⁰⁹Bi(⁴⁹Ti,2n); measured half-life from SF and α-decay curves. According to results of experiments in [2001He35](#), the SF activity reported by [1983OgZX](#) was most likely from ²⁵⁶Rf produced in ε decay of ²⁵⁶Db.

[2001He35](#) (also [1999He11](#),[1999He07](#)): ²⁵⁶Db produced in ²⁰⁹Bi(⁵⁰Ti,3n),E=4.59-5.08 MeV/nucleon, evaporation residues from filtering by SHIP separator at GSI. Measured Eα, T_{1/2}(α), αα and α(SF) parent-daughter correlations. A total of 16 α-decay chains were assigned involving the production of ²⁵⁶Db. The authors also found evidence for ε decay mode of ²⁵⁶Db resulting in ²⁵⁶Rf which decays primarily by SF decay mode, and that is the SF activity which was most likely observed by [1983OgZX](#).

[2008Ne01](#): ²⁵⁶Db from α decay of ²⁶⁰Bh produced in ²⁰⁹Bi(⁵²Cr,n),E=257.0 MeV beam provided by 88-Inch Cyclotron at LBNL. The nuclei were analyzed using Berkeley Gas-Filled Separator. ²⁵⁶Db, ²⁵²Lr and ²⁴⁸Md formed through successive α-decay chain.

There are several α groups reported by [2008Ne01](#) in ²⁶⁰Bh α decay which suggests population of excited states in ²⁵⁶Db, but no levels have been explicitly proposed at present.

²⁵⁶Db Levels

Cross Reference (XREF) Flags

A ²⁶⁰Bh α decay (35 ms)

E(level)	T _{1/2}	XREF	Comments
0.0	1.6 s +5-3	A	<p>%α=70 11; %ε=30 11; %SF=?</p> <p>%α: weighted average taken by 2008Ne01 of their result, which is not stated in the paper but presumably 76% 11, and %α=64 12 implied from measured %ε=36 12 by 2001He35. %ε=100-%α. Other: 36% 12 (2001He35).</p> <p>2001He35 did not find any evidence for SF decay mode of ²⁵⁶Db, however, did observe SF events while studying the decay of ²⁵⁶Db. These SF events were ascribed to the decay of ²⁵⁶Rf, ε daughter of ²⁵⁶Db. The SF decay events observed by 1983OgZX in the decay study of ²⁵⁶Db were most likely due to the same decay process.</p> <p>E(level): the 1.6-s activity is assumed to belong to g.s. of ²⁵⁶Db.</p> <p>J^π: in theoretical calculations by 1997Mo25, 1/2⁻ proton and 9/2⁺ neutron orbitals were specified, which would suggest J^π=4⁻,5⁻.</p> <p>T_{1/2}: from (implants)α-correlations (2001He35). Other values from 2001He35 from SF events are: 2.3 s +11-6 and 1.7 s +9-4, in agreement with their adopted value but much less precise. 1983OgZX obtained T_{1/2}=2.6 s +14-8 from SF observed in ²⁰⁹Bi(⁴⁹Ti,2n) reaction and in ²⁶⁰Bh α decay. Weighted average of all the four values is 1.8 s +4-2, but the evaluator prefers the value recommended by 2001He35.</p> <p>Theoretical half-lives (1997Mo25) of 15.1 s for α and 22.9 s for β decays, for example predict %α=17.2 and %β⁺=11.4 which suggest %SF=71.4. Theoretical calculations by 1985Lo17 predict T_{1/2}(SF)≈0.01 s, suggesting %SF≈100, which is in disagreement with experimental results from 2008Ne01 and 2001He35, who determined large α and β branches, and no evidence of SF decay.</p>