

<sup>257</sup>Db  $\alpha$  decay (2.3 s) 2009He20,2010He11

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli		NDS 114, 1041 (2013)	1-Mar-2012

Parent: <sup>257</sup>Db: E=0; J <sup>$\pi$</sup> =(9/2<sup>+</sup>); T<sub>1/2</sub>=2.3 s 2; Q( $\alpha$ )=9206 20; % $\alpha$  decay $\geq$ 94.0

<sup>257</sup>Db-J <sup>$\pi$</sup> : Possible configuration=9/2[624].

<sup>257</sup>Db-T<sub>1/2</sub>: Measured in 2009He20. Other: 1.5 s +9-4 (2010He11).

<sup>257</sup>Db-Q( $\alpha$ ): From 2011AuZZ.

<sup>257</sup>Db-Predicted configuration=9/2[624] (2010He11).

2009He20,2010He11: <sup>257</sup>Db produced in the <sup>209</sup>Bi(<sup>50</sup>Ti,2n) reaction with the <sup>50</sup>Ti beam delivered by the charge state injector of the UNILAC accelerator at GSI Darmstadt. Evaporation residues were separated by the velocity filter SHIP and implanted into a 16-strip Si PIPS detector. A box of six Si-wafers was used to measure escaping  $\alpha$ -particles. A Ge clover detector consisting of four crystals was used to measure  $\gamma$ 's in coincidence with particles. Measured E $\alpha$ , E $\gamma$ ,  $\alpha\gamma$  coin, half-lives,  $\sigma$ .

2001He35: measured  $\alpha$ , E $\alpha$ .

2005KuZZ (earlier report: 2004HeZZ): Measured  $\alpha\gamma$ . Source implanted in a position-sensitive PIPS-detector, Ge-clover detector.

1986He28, 1985He22: <sup>209</sup>Bi(<sup>50</sup>Ti,2n), E=4.65-4.95 MeV/A. Measured  $\alpha$ , SF, ( $\alpha$ ) $\gamma$ , ( $\alpha$ )x, time-of-flight, excit; surface barrier detectors. Reinvestigation with E=4.59-5.08 MeV/A has shown that two isomers of <sup>257</sup>Db are involved (1999He11). Other: 1999He07.

<sup>253</sup>Lr Levels

E(level)	J <sup><math>\pi</math></sup>	T <sub>1/2</sub>	Comments
0.0	(7/2 <sup>-</sup> )	0.57 s +7-6	J <sup><math>\pi</math></sup> : configuration=7/2 <sup>-</sup> [514] (2001He35,2005KuZZ). T <sub>1/2</sub> : from 2001He35, 1999He11.
107	(9/2 <sup>+</sup> )		Possible configuration=9/2[624].

$\alpha$  radiations

E $\alpha$ <sup>†</sup>	E(level)	Comments
8874 20		Weak group.
8965 20	107	E $\alpha$ : others: 8956 20 (2010He11), 8967 15 (2001He35).
9066 <sup>‡</sup> 20	0.0	E $\alpha$ : HF=11 if 9066 $\alpha$ is from 9/2 <sup>+</sup> to 7/2 <sup>-</sup> , this HF value is low for $\Delta(\pi)$ =yes. This group could also be a sum line of 8965 $\alpha$ and conversion electrons. E $\alpha$ : other: 9063 20 (2010He11), 9074 10 (2001He35).

<sup>†</sup> From 2009He20.

<sup>‡</sup> Existence of this branch is questionable.

$\gamma$ (<sup>253</sup>Lr)

E $\gamma$	E <sub>i</sub> (level)	Comments
<sup>x</sup> 102.2		Only one coincidence event of 102.2 $\gamma$ and 8941 $\alpha$ was observed; this $\gamma$ ray does not satisfy criterion for E1 transition expected between 9/2 <sup>+</sup> and 7/2 <sup>-</sup> levels.

<sup>x</sup>  $\gamma$  ray not placed in level scheme.