

Adopted Levels

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia		NDS 143, 1 (2017)	31-Mar-2017

S(p)=1170 40; Q( $\alpha$ )=8040 12 [2017Wa10](#)

S(n)=9060 ([1997Mo25](#) – calculated value).

First identification of  $^{193}\text{Rn}$  nuclide by [2006An36](#).

$^{193}\text{Rn}$  produced and identified in  $^{144}\text{Sm}(^{52}\text{Cr},3n)$  reaction at E=252 MeV;  $^{144}\text{SmF}_3$  rotating target onto a carbon backing.

UNILAC heavy-ion facility at GSI, with SHIP velocity filter for separating evaporation residues.

Detector system: Several different types of detectors were used: The decays of the evaporation residues were measured by implanting residues in a thick 16-strip position-sensitive silicon detector (PSSD) with a typical FWHM  $\approx$  20 keV for  $\alpha$  particles in 6-8 MeV range. An array of six silicon detectors of similar shape (BOX detectors), mounted upstream of PSSD detector, was used to measure the energies of  $\alpha$ ,  $\beta$  and conversion electrons. Three thin time-of-flight detectors in front of the PSSD and BOX detectors permitted identification of reaction products from the scattered beam particles; and distinction between the decay events and implantation events through anti-coincidence technique. An additional thick Si detector was installed as a veto detector behind the PSSD detector in an anti-coincidence mode. This allowed distinction between the decays and the punch-through events (from high-energy protons and  $\alpha$  particles produced in the reactions on the carbon backing). For  $\gamma$  rays, a four-fold segmented ‘Clover’ Ge detector was used behind the PSSD detectors for prompt and delayed  $\gamma$ (residues) coin and/or  $\alpha\gamma$  coin measurements.

Measured  $\alpha$ ,  $\gamma$ ,  $\alpha\gamma$  coin,  $\alpha$ (residues) coin,  $\gamma$ (residues) coin. Results are also discussed in [2007An19](#).

 $^{193}\text{Rn}$  Levels

E(level)	$T_{1/2}$	Comments
0.0	1.15 ms 27	<p><math>\% \alpha \approx 100</math> (<a href="#">2006An36</a>)</p> <p>Calculated <math>\beta</math> decay half-life=0.527 s (<a href="#">1997Mo25</a>) suggests negligible <math>\varepsilon+\beta^+</math> decay mode.</p> <p>E(level): assumed as the ground state of <math>^{193}\text{Rn}</math>.</p> <p><math>J^\pi</math>: (3/2<sup>-</sup>) from systematics (<a href="#">2006An36</a>).</p> <p><math>T_{1/2}</math>: from analysis of 19 full-energy (recoil)(7670-7890 keV <math>\alpha</math>) decays (<a href="#">2006An36</a>).</p> <p>Energy of <math>\alpha</math> particles: 7685 15, <math>I_\alpha=74\%</math> 20 and 7875 20 <math>I_\alpha=26\%</math> 12. A 194<math>\gamma</math> is seen in coin with 7685<math>\alpha</math> (<a href="#">2006An36</a>).</p> <p>From systematics of decays of odd-A Rn isotopes, the decay pattern of <math>^{193}\text{Rn}</math> is found to be different from higher mass Rn isotopes, which, according to <a href="#">2006An36</a>, suggests a possible prolate deformed shape for this nucleus.</p> <p>Production cross section (at E(<math>^{52}\text{Cr}</math>)=248 MeV)=50 pb 20 (<a href="#">2006An36</a>).</p>