

Adopted Levels

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 202,59 (2025)	25-Feb-2025

$Q(\beta^-)=12759$ 45; $S(n)=2706$ 52; $S(p)=19280$ syst; $Q(\alpha)=-14370$ syst [2021Wa16](#)
 $Q(\beta^-), S(n)$: Deduced by the evaluator from mass excesses of -28208 45 for ⁶⁵Cr and -33573 26 for ⁶⁴Cr measured by [2022Si20](#), and -40967 4 for ⁶⁵Mn from [2021Wa16](#). Values from [2021Wa16](#): $Q(\beta^-)=12660$ 200 (syst), $S(n)=2740$ 360 (syst).
 $\Delta S(p)=450$, $\Delta Q(\alpha)=360$ (syst,[2021Wa16](#)).
 $S(2n)=8147$ 49, $Q(\beta^-n)=6710$ 45, from mass excesses of ⁶⁵Cr and ⁶³Cr (-36204 18) measured by [2022Si20](#) and -42989 4 for ⁶⁴Mn from [2021Wa16](#). Values from [2021Wa16](#): $S(2n)=8270$ 210 (syst), $Q(\beta^-n)=6610$ 200 (syst).
 $S(2p)=37030$ 540 (syst,[2021Wa16](#)).
 Mass measurements: [2022Si20](#) (M.E. $=-28208$ 45), [2020Me06](#) (M.E. $=-27280$ 780).
[2022Si20](#): ⁶⁵Cr was produced via U(p,X) with a 480 MeV proton beam impinged on a UC_x target at the ISAC facility of TRIUMF. Fragments were separated by the ISAC dipole magnetic separator and sent to a Multiple-Reflection Time-of-Flight Mass Spectrometer (MR-TOF-MS) of the TITAN facility. Measured time-of-flight, storage time. Deduced mass excess, $T_{1/2}$.
[2020Me06](#): ⁶⁵Cr was produced by fragmentation of a 140 MeV/nucleon ⁸²Se beam on a Be target at NSCL. Fragments were separated by the A1900 fragment separator, analyzed with the S800 spectrograph, and stopped in the focal plane of S800, with identification using the TOF- ΔE method. Deduced mass excess from the magnetic-rigidity corrected time-of-flight (TOF- $B\rho$) mass spectrometry.
[2011Da08](#): ⁶⁵Cr was produced in the fragmentation of 57.8 MeV/nucleon ⁸⁶Kr beam impinged on 50 mg/cm² thick tantalum target at GANIL. Fragments were identified and selected using the LISE-2000 spectrometer with a three-element Si-detector telescope, and implanted into a double-sided silicon-strip detector (DSSSD) backed by a Si(Li) detector and surrounded by four clover type EXOGAM Ge detectors. Measured implant- β time correlation. Deduced ⁶⁵Cr decay half-life. See also [2002MaZN](#) thesis.
[2005Ga01,2003So21](#): ⁶⁵Cr was produced by fragmentation of a 61.8 MeV/nucleon ⁷⁶Ge beam on a ⁵⁸Ni target at GANIL. Fragments were identified and separated by the LISE3 spectrometer with 3 consecutive silicon detectors, and implanted into the last Si detector surrounded by 4 Ge detectors for γ detection. Measured $E\beta$, $\beta\gamma$ -coin, implant- $\beta(t)$. Deduced ⁶⁵Cr decay $T_{1/2}$.
[1997Be70](#): ⁶⁵Cr was produced by fission of uranium projectiles at relativistic energies on a beryllium target at GSI. Identification of fission fragments was done with a fragment separator (FRS) using energy-loss measurements for element identification, and time-of-flight and magnetic rigidity for mass determination. Measured production yields. See also [1995CzZZ](#) for their first measurement and preliminary results.
[1995CzZZ](#): Pb,Be(²³⁸U,F) $E=750$ MeV/nucleon at GSI. A preliminary result reveals more than 50 new neutron-rich isotopes ranging from ⁶²V to ¹²⁰Ru identified by time-of-flight using the fragment separator FRS. No detailed results are presented. This preliminary report is superseded by [1997Be70](#).
 Theoretical calculation:
[2011Gu03](#): calculated rms radius of p-wave valence neutron distribution.

⁶⁵Cr Levels

E(level)	T _{1/2}	Comments
0.0	27 ms 3	$\% \beta^- = 100$ J^π : $1/2^-$ (syst, 2021Ko07), $9/2^+$ (predicted, 2019Mo01). $T_{1/2}$: weighted average of 27 ms 3 (2005Ga01,2003So21) and 28 ms 3 (2011Da08), both from implant- β time correlation, and 23 ms 12 from a storage-time measurement (2022Si20). From measured intensities of γ rays from the β decay of ⁶⁵ Cr and daughter nucleus ⁶⁵ Mn, 2005Ga01 claim that the decay of ⁶⁵ Cr stays in the A=65 chain and scarcely occurs through β -delayed neutron emissions. Calculated $\% \beta^- 0n=92$, $\% \beta^- 1n=8$ (2019Mo01). Calculated $\% \beta^- 0n=96.44$, $\% \beta^- 1n=3.44$, $\% \beta^- 2n=0.12$ (2021Mi17).