

Adopted Levels

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen [#] and Balraj Singh		NDS 135, 1 (2016)	31-May-2016

S(n)=20340 CA; S(p)=1240 SY; Q(α)=-6850 SY [2012Wa38,1997Mo25](#)

Estimated uncertainties (syst,[2012Wa38](#)): $\Delta S(p)=\Delta Q(\alpha)=500$.

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

S(2p)=-510 430, Q(ϵp)=14650 400 (syst,[2012Wa38](#)). Theoretical S(2n)=38750.

[1996Bi21](#): ^{42}Cr identified from $^9\text{Be}(^{58}\text{Ni},X)$ E=600 MeV/nucleon; measured fragment charge vs mass to charge ratio at GANIL facility.

[2001Gi01](#) (also [2001Gi02,2002Ch28,2000Bi01,1999Bi08](#)): Ni($^{58}\text{Ni},X$) at 74 MeV/nucleon at GANIL facility. Measured cross section, half-life and particle spectra.

[2007Do17](#): fragmentation reaction used to produce ^{42}Cr isotope at SISSE/LISE3 facility in GANIL. Primary beam: $^{58}\text{Ni}^{26+}$ at 74.5 MeV/nucleon; target=natural Ni. Fragment separator=ALPHA-LISE3. Fragment identification by energy loss, residual energy and time-of-flight measurements using two micro-channel plate (MCP) detectors and Si detectors. Double-sided silicon-strip detectors (DSSSD) and a thick Si(Li) detector were used to detect implanted events, charged particles and β particles. The γ rays were detected by four Ge detectors. Coincidences measured between charged particles and γ rays.

^{42}Cr is a possible candidate for 2p decay. Theoretical calculations of this decay mode: [2003Gr24, 2001Gr29, 1996Na03, 1991Br06, 1988Go21, 1988Go24](#).

 ^{42}Cr Levels

E(level)	J $^{\pi}$	T $_{1/2}$	Comments
0	0 ⁺	13.3 ms 10	<p>$\% \epsilon + \% \beta^+ \approx 100$; $\% \epsilon p = 94.4$ 50 (2007Do17)</p> <p>T$_{1/2}$: measured by time correlation of implantation events due to ^{42}Cr and subsequent emission of protons and γ rays (2007Do17). Previous result from the same group: 13.4 ms ³⁶⁻²⁴ (2001Gi01).</p> <p>Total proton branching ratio is from time spectrum of events with energy >900 keV in the charged-particle spectrum. Possible small contributions from delayed-α and delayed-2p decays were ignored.</p> <p>No evidence was found for 2p decay (2001Gi01) where a 1.9 MeV peak in the charged-particle spectrum was ascribed to delayed proton decay.</p> <p>^{42}Cr decays by $\beta^+ + \epsilon$ to ^{42}V whose g.s. is unbound towards proton emission, thus each β decay is followed by a proton decay to ^{41}Ti.</p>