## $^{58}$Ni($^{86}$Kr,X$\gamma$) 2006DaZX,1999So20,1998Gr14

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

Adapted from the XUNDL dataset for 2007Lu13, compiled by S. Geraedts and B. Singh (McMaster), on September 3, 2007.

2006DaZX,2010Da06: E=60.5 MeV/nucleon $^{86}$Kr beam was produced from the accelerator at GANIL. Target was natural Ni. Fragments were separated by the LISE spectrometer and selected ions were implanted into a three-element Si detector telescope surrounded by four HPGe detectors and a Low Energy Photon Spectrometer (LEPS). Measured E$\gamma$, $\gamma\gamma$-coin, $\gamma$(t). Deduced levels, $T_{1/2}$, J, $\pi$. Comparisons with shell model calculations.

1999So20: E=60.4 MeV/nucleon $^{86}$Kr beam was produced at GANIL. Target was 140−$\mu$m-thick $^{58}$Ni. Selected nuclei were implanted into 4 consecutive silicon detectors surrounded by four Ge detectors and a segmented LEPS clover detector. Measured E$\gamma$, $\beta\gamma$-coin, implant-$\beta$(t). Deduced $^{65}$Fe $T_{1/2}$.

1998Gr14: E=60.3 MeV/nucleon $^{86}$Kr beam was produced at GANIL. Target was natural Ni. Selected nuclei were implanted into a detection system consisting of six planar silicon detectors surrounded by four HPGe detectors and a LEPS. Measured E$\gamma$, $\gamma\gamma$-coin, $\gamma$(t). Deduced $T_{1/2}$.

### $^{65}$Fe Levels

| E(level)[†‡] | J$^\pi$[#] | $T_{1/2}$ | Comments |
|---|---|---|---|
| 0.0 | (1/2$^-$) | 1.32 s *28* | J$^\pi$: other: (5/2$^-$) from shell-model calculations in 2006DaZX.<br>$T_{1/2}$: from implant-$\beta$(t) in 1999So20. The authors state that $\beta$-decaying isomer may be present even thought it was not observed. Note that a (9/2$^+$) $\beta$-decaying isomer has been observed in later studies with a $T_{1/2}$ very close to this value. See Adopted Levels for the isomer. |
| 363.3 *5* | (3/2$^-$) | | J$^\pi$: other: (1/2$^-$) from shell-model calculations in 2006DaZX; (5/2$^-$) is assigned by 1998Gr14 assuming the 363$\gamma$ is an isomeric transition, based on their assignment of the measured $T_{1/2}$=0.43 $\mu$s *13* (from 363$\gamma$(t)) to this level, however, this $T_{1/2}$ is most likely for 397 level according to the observed 33.5$\gamma$-363.3$\gamma$-coin in 2006DaZX. Also see comments at 397 level. |
| 396.8 *7* | (5/2$^+$) | 0.420 $\mu$s *13* | J$^\pi$: other: (1/2$^+$) from shell-model calculations in 2006DaZX.<br>$T_{1/2}$: from $\gamma$(t) in 1999So20. Other: 0.43 $\mu$s *13* from $\gamma$(t) in 1998Gr14 is assigned to the 363 level by the authors, but 33.5$\gamma$-363.3$\gamma$-coin seen in 2006DaZX indicates that it should be for 397 level. This is also confirmed in $^{65}$Mn $\beta^-$ decay (2013Ol06) and $^{66}$Mn $\beta^-$n decay (2018St18). |

† Additional information 1.
‡ From E$\gamma$ data.
# From Adopted Levels. Assignments proposed by 2006DaZX based on shell-model calculations are different and given under comments.

### $\gamma$($^{65}$Fe)

| E$_\gamma$[†] | E$_i$(level) | J$_i^\pi$ | E$_f$ | J$_f^\pi$ | Comments |
|---|---|---|---|---|---|
| 33.5 *5* | 396.8 | (5/2$^+$) | 363.3 | (3/2$^-$) | |
| 363.3 *5* | 363.3 | (3/2$^-$) | 0.0 | (1/2$^-$) | 2006DaZX state that this $\gamma$ is seen in coincidence with 33.5$\gamma$, delayed by a few ns. |

† From 2006DaZX. Also quoted in 2010Da06.

Legend

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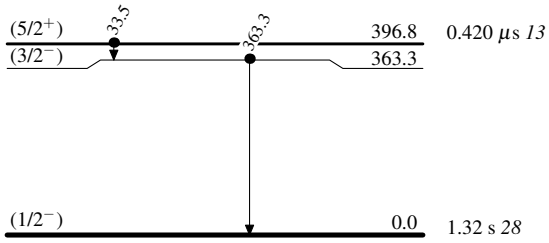
Level Scheme

● Coincidence




$^{65}_{26}Fe_{39}$