C(^{40}S,^{38}Si2pγ)   2012Ta20

	Type	Author	History Citation	Literature Cutoff Date
	Full Evaluation	Jun Chen	NDS 152, 1 (2018)	30-Sep-2017

2012Ta20: E=385 MeV/nucleon ^{48}Ca primary beam with an average intensity of 70 pnA was produced at the RIBF facility at RIKEN and incident on a 15-mm-thick rotating beryllium target. A secondary ^{40}S beam was analyzed by the BigRIPS fragment separator and accelerated to E=210 MeV/nucleon with an intensity of 6×10^4 pps. The secondary target was a 2.54 g/cm^2 carbon foil. Reaction products were analyzed by the ZeroDegree spectrometer and identified using the energy loss (ionization chamber), magnetic rigidity and time-of-flight (plastic scintillators); γ rays were detected by the DALI2 array of 186 NaI(Tl) detectors surrounding the reaction target (20% efficiency, FWHM=10% at Eγ=1 MeV). Measured Eγ, Iγ, particle-γ-coin. Deduced levels, J^π, rapid deformation development of Si isotopes. Comparison with shell-model calculations.

^{38}Si Levels

E(level)[†]	$J^{\pi\ [‡]}$	Comments
0	0^+	
1071 *12*	2^+	
2239? *25*	(4^+)	J^π: this level is tentatively assigned by 2012Ta20 based on $\gamma\gamma$-coin as the first 4^+ state predicted by shell-model calculations. The resulting energy ratio between the first 4^+ and 2^+ states is R$_{4/2}$=2.09 *5* (2012Ta20).
2355? *29*	(4^+)	

[†] From Eγ data.
[‡] Predicted by shell-model calculations (2012Ta20).

γ(^{38}Si)

E$_\gamma$	E$_i$(level)	J^π_i	E$_f$	J^π_f	Comments
1071 *12*	1071	2^+	0	0^+	
1168[†] *22*	2239?	(4^+)	1071	2^+	E$_\gamma$: most probable direct feeding to the first 2^+ state based on the comparison of measured peak yield in $\gamma\gamma$-coin spectrum with expected value (2012Ta20).
1284[†] *26*	2355?	(4^+)	1071	2^+	

[†] Very weak peak.

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Level Scheme

$^{38}_{14}$Si$_{24}$