^{19}F(α,γ)　　1984Cs01

	History		
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia[#], A. Chakraborty[##]	NDS 171,1 (2021)	1-Jun-2020

Other: 1986No05.

1984Cs01: Target − SrF$_2$ (thickness 40 keV at E$_\alpha$=2.1 MeV) onto 0.3 mm thick Cu backing; Projectile: α beam, E=1.5-3.7 MeV; γ rays were measured by Ge(Li) detector (FWHM 2.7 keV at 1330 keV), for $\gamma(\theta)$ measurements NaI and another Ge(Li) detectors were used as moving and monitoring detectors, respectively, at five angles; Deduced resonance levels, width, strength, γ-ray branching. FWHM 6 keV in the c.m. system at Eα=2.35 MeV.

^{23}Na Levels

E(level)[†]	J$^{\pi}$[#]	Γ[@]	Comments
0.0	3/2$^+$		
440[‡]	5/2$^+$		
2076[‡]	7/2$^+$		
2391[‡]	1/2$^+$		
2641[‡]	1/2$^-$		
2982[‡]	3/2$^+$		
3678[‡]	3/2$^-$		
3848[‡]	5/2$^-$		
3915[‡]	5/2$^+$		
12122 5		4 keV 2	E$_\alpha$=2003 keV 5 (Lab).
			Strength S=(2J+1)($\Gamma_\alpha\Gamma_\gamma$)/$\Gamma$=39 meV 17 of the (α,γ) resonance.
12184 5	5/2,3/2		E$_\alpha$=2078 keV 5 (Lab).
			Strength S=98 meV 48 relative to the (α,γ) strength of the 12122 keV resonance level.
			J$^\pi$: From γ-ray (res to g.s.) angular distribution measurements.
12202 5		9 keV 4	E$_\alpha$=2100 keV 5 (Lab).
12272 5		6 keV 3	E$_\alpha$=2185 keV 5 (Lab).
12317 5			E$_\alpha$=2240 keV 5 (Lab).
12488 5		5 keV 2	E$_\alpha$=2446 keV 5 (Lab).
12545 5		6 keV 3	E$_\alpha$=2515 keV 5 (Lab).
12602 5		8 keV 4	E$_\alpha$=2585 keV 5 (Lab).
12640 5		10 keV 5	E$_\alpha$=2631 keV 5 (Lab).
12729 5		13 keV 6	E$_\alpha$=2738 keV 5 (Lab).
12800 5		6 keV 3	E$_\alpha$=2824 keV 5 (Lab).
12818 5		5 keV 2	E$_\alpha$=2846 keV 5 (Lab).
12848 5		11 keV 5	E$_\alpha$=2882 keV 5 (Lab).
12852 5		9 keV 4	E$_\alpha$=2887 keV 5 (Lab).
12942 5		6 keV 3	E$_\alpha$=2996 keV 5 (Lab).
13074 5		12 keV 6	E$_\alpha$=3156 keV 5 (Lab).
13184 5		9 keV 4	E$_\alpha$=3289 keV 5 (Lab).
13196 5		9 keV 4	E$_\alpha$=3303 keV 5 (Lab).
13248 5		10 keV 5	E$_\alpha$=3366 keV 5 (Lab).
13279 5		14 keV 7	E$_\alpha$=3404 keV 5 (Lab).
13337 5		8 keV 4	E$_\alpha$=3474 keV 5 (Lab).
13399 5		13 keV 6	E$_\alpha$=3549 keV 5 (Lab).
13460 5		23 keV 11	E$_\alpha$=3623 keV 5 (Lab).
13509 5		10 keV 5	E$_\alpha$=3682 keV 5 (Lab).
13528 5			E$_\alpha$=3706 keV 5 (Lab).

[†] From E$_\alpha$ (Lab) (1984Cs01 − listed in comments) and Q(α)=10467.3 (2017Wa10), except where otherwise noted. Uncertainty for E$_\alpha$ (Lab) noted as 3-5 keV − evaluators list 5 keV for all.

^{19}F(α,γ)   **1984Cs01 (continued)**

^{23}Na Levels (continued)

‡ From Adopted Levels, rounded value to the nearest keV and without uncertainty. Listed for γ-ray placement.
$^{\#}$ From Adopted Levels, except where otherwise noted.
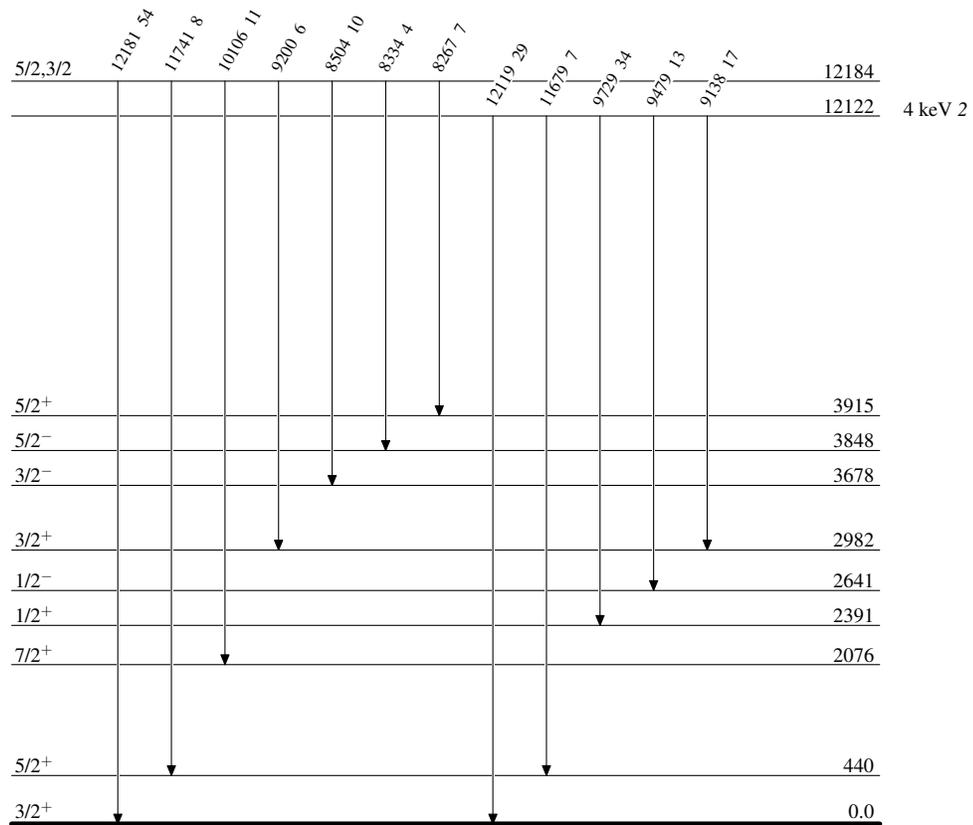$^{@}$ Uncertainty 30-50% (1984Cs01).

$\gamma(^{23}$Na$)$

E_i(level)	J_i^π	E_γ†	I_γ	E_f	J_f^π	E_i(level)	J_i^π	E_γ†	I_γ	E_f	J_f^π
12122		9138	17 *3*	2982	3/2$^+$	12184	5/2,3/2	8334	4 *1*	3848	5/2$^-$
		9479	13 *4*	2641	1/2$^-$			8504	10 *2*	3678	3/2$^-$
		9729	34 *9*	2391	1/2$^+$			9200	6 *1*	2982	3/2$^+$
		11679	7 *3*	440	5/2$^+$			10106	11 *2*	2076	7/2$^+$
		12119	29 *7*	0.0	3/2$^+$			11741	8 *2*	440	5/2$^+$
12184	5/2,3/2	8267	7 *2*	3915	5/2$^+$			12181	54 *4*	0.0	3/2$^+$

† From level energy differences, recoil energy subtracted.

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Level Scheme

Intensities: % photon branching from each level

$^{23}_{11}$Na$_{12}$