

$^9\text{Be}(^{36}\text{S},\text{X}\gamma)$  2008So09

Type	Author	Citation	Literature Cutoff Date
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2008So09: XUNDL dataset compiled by McMaster, 2008.

An  $E(^{36}\text{S})=77.5$  MeV/nucleon beam was delivered to the GANIL/SPEG spectrometer. In the first part of the experiment, the beam bombarded a  $2.77$  mg/cm $^2$   $^9\text{Be}$  target and the SPEG magnetic spectrometer was used to momentum analyze the reaction products and identify  $^{19}\text{N}_{\text{g.s.}}$ .

In the second part, a  $^{12}\text{C}$  target at the entrance of the SISSI device produced a cocktail beam of  $^{24}\text{F}$ ,  $^{25,26}\text{Ne}$ ,  $^{27,28}\text{Na}$ , and  $^{29,30}\text{Mg}$  that was purified in the  $\alpha$  spectrometer and then delivered to a carbon target at the dispersive image of the SPEG spectrometer. The target was surrounded by the 74 element  $\text{BaF}_2$  *Chateau de crystal* array and four HPGe detectors. The  $\gamma$  rays observed in coincidence with  $^{19}\text{N}$  ions detected at the SPEG focal plane were analyzed to obtain information on the  $^{19}\text{N}$  level structure.  $E\gamma$ ,  $I\gamma$ ,  $\gamma\gamma$ -coin were measured using 74  $\text{BaF}_2$  crystals and four HPGe detectors.

Energy levels and  $J^\pi$  values were proposed from comparison with shell-model calculations. See also (2012Yu07).

 $^{19}\text{N}$  Levels

E(level) <sup>†</sup>	$J^\pi$ <sup>‡</sup>	Comments
0	(1/2 <sup>-</sup> )	
1143 3	(3/2 <sup>-</sup> )	$J^\pi: \pi p_{1/2}^{-1} \otimes (\text{first } 2^+ \text{ in } ^{20}\text{O})$ .
1676 3	(5/2 <sup>-</sup> )	$J^\pi: \pi p_{1/2}^{-1} \otimes (\text{first } 2^+ \text{ in } ^{20}\text{O})$ .
2132 9	(5/2 <sup>+</sup> , 3/2 <sup>-</sup> )	Possible intruder state if 5/2 <sup>+</sup> .
2511 5	(1/2 <sup>+</sup> )	Possible intruder state.
3170 6	(7/2 <sup>-</sup> )	
4023 9	(7/2 <sup>-</sup> )	

<sup>†</sup> From least-squares fit to  $E\gamma$ 's.

<sup>‡</sup> From comparison with shell-model calculations and decay pattern.

 $\gamma(^{19}\text{N})$ 

$E_\gamma$	$I_\gamma$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$
532 2	38 3	1676	(5/2 <sup>-</sup> )	1143	(3/2 <sup>-</sup> )
1141 3	100 5	1143	(3/2 <sup>-</sup> )	0	(1/2 <sup>-</sup> )
1368 4	24 3	2511	(1/2 <sup>+</sup> )	1143	(3/2 <sup>-</sup> )
1494 6	16 3	3170	(7/2 <sup>-</sup> )	1676	(5/2 <sup>-</sup> )
1681 5	15 3	1676	(5/2 <sup>-</sup> )	0	(1/2 <sup>-</sup> )
2016 <sup>†</sup> 11	6 3	3170	(7/2 <sup>-</sup> )	1143	(3/2 <sup>-</sup> )
2132 9	8 3	2132	(5/2 <sup>+</sup> , 3/2 <sup>-</sup> )	0	(1/2 <sup>-</sup> )
2347 9	11 4	4023	(7/2 <sup>-</sup> )	1676	(5/2 <sup>-</sup> )
2507 <sup>†</sup> 11	6 3	2511	(1/2 <sup>+</sup> )	0	(1/2 <sup>-</sup> )

<sup>†</sup> Placement of transition in the level scheme is uncertain.

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## Legend

## Level Scheme

Intensities: Relative  $I_\gamma$ 

- $\longrightarrow$   $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $\longrightarrow$   $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $\longrightarrow$   $I_\gamma > 10\% \times I_\gamma^{\text{max}}$
- $\dashrightarrow$   $\gamma$  Decay (Uncertain)

