$$^{181}\text{Ta}(^{18}\text{O},^{17}\text{O}) \quad \textbf{2020Zi03}$$

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. G. Sheu, J. H. Kelley, J. Purcell	ENSDF	5-Aug-2021

2020Zi03, 2021Ci02:

A beam of 126 MeV ^{18}O ions from the GANIL cyclotrons impinged on a 6.64 mg/cm^2 ^{181}Ta target. The ^{17}O ions that scattered at θ=45° (±6°) were momentum analyzed using the VAMOS++ ion tracking system. A collection of γ-ray detectors from the AGATA and PARIS arrays plus two large-volume LaBr$_3$ detectors provided a high granularity for γ-ray energy and angle measurement. The γ-ray detectors were aligned along the VAMOS++ axis at $\theta_{\text{rel.}}$=115°−175° (AGATA) and $\theta_{\text{rel.}}$=90°(PARIS+LaBr$_3$). The γ rays detected in coincidence with ^{17}O ions in the VAMOS++ spectrometer were analyzed.

The authors developed a Monte Carlo analysis of the Doppler shift attenuation spectrum that accounts for population (and subsequent deexcitation) of levels via low-momentum transfer and deep-inelastic reaction processes. The accuracy of the method relies on the precise angle determination between the scattered projectile and the Doppler-shifted γ ray.

^{17}O Levels

E(level)	$T_{1/2}$	Comments
0.0		
871.		
3055.	110 fs +28−21	$T_{1/2}$: From $\tau=159^{+40}_{-30}$ fs and Eγ=2184.3 $^{+3}_{-2}$ in present analysis.
3842.		

$\gamma(^{17}$O)

E$_i$(level)	E$_\gamma$[†]	I$_\gamma$	E$_f$
871.	871.	100	0.0
3055.	2184.3 *3*	100	871.
3842.	3842	100	0.0

[†] From energy level difference.

^{181}Ta(^{18}O,^{17}O)   2020Zi03

Level Scheme

Intensities: % photon branching from each level

${}^{17}_{8}$O$_9$