12 C(34 Na, 33 Na γ) **2010Do05**

History

Type Author Citation Literature Cutoff Date
Full Evaluation Jun Chen and Balraj Singh NDS 112, 1393 (2011) 31-Mar-2011

Includes $^{12}\text{C}(^{33}\text{Na},^{33}\text{Na}'\gamma)$.

2010Do05: Isotopes of interest produced by projectile fragmentation of 48 Ca¹⁸⁺ primary beam at E=345 MeV/u on a 20 mm thick rotating Be target at the Radioactive Ion beam Factory (RIBF) at RIKEN. Fragmentation products selected and separated using the $B\rho$ - ΔE - $b\rho$ method and incident on a 2.54 g/cm² carbon target at E=230-250 MeV/u. A NaI(Tl) based array (DALI2) with a efficiency of 15% at E γ =1332.5 keV, for detecting the γ -rays and a spectrometer (ZeroDegree) for detecting and identifying the reaction products. Measured E γ , p γ -coincidence. Deduced level energy for an excited state in 33 Na for the first time. Also includes 12 C(33 Na, 33 Na' γ).

³³Na Levels

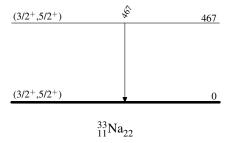
E(level) $J^{\pi^{\dagger}}$ Comments 0 $(3/2^+,5/2^+)$ J^{π} : $(3/2^+)$ in Adopted Levels. 467 13 $(3/2^+,5/2^+)$ J^{π} : $(5/2^+)$ in Adopted Levels.

 γ (33Na)

$$\frac{E_{\gamma}}{467 \ 13} \ \frac{E_{i}(\text{level})}{467} \ \frac{J_{i}^{\pi}}{(3/2^{+},5/2^{+})} \ \frac{E_{f}}{0} \ \frac{J_{f}^{\pi}}{(3/2^{+},5/2^{+})} \ \frac{Comments}{E_{\gamma}: \text{ average of 476 12 in } (^{33}\text{Na},^{33}\text{Na}'\gamma) \text{ and 447 13 in } (^{34}\text{Na},^{33}\text{Na}\gamma).}$$

$^{12}\text{C}(^{34}\text{Na},^{33}\text{Na}\gamma)$ 2010Do05

Level Scheme



[†] From systematics of odd-A Na nuclides (2010Do05). Comparison with shell-model calculations, which predict 3/2⁺ for g.s. and 5/2⁺ for almost a degenerate state at 59 keV. The next 3/2⁺ and 7/2⁺ states are around 1 MeV. Experimental energy of 467 keV is not in agreement with excited state energies and spins from shell model calculations.