

$^{192}\text{Os}(\alpha, \alpha')$  1981Ba49

| Type            | Author          | History<br>Citation  | Literature Cutoff Date |
|-----------------|-----------------|----------------------|------------------------|
| Full Evaluation | Coral M. Baglin | NDS 113, 1871 (2012) | 15-Jun-2012            |

Others: 1976Ba06, 1976Ba23, 1978Bu21.

Note that 1989Ba54 ( $^{192}\text{Os}(p, p')$ , (pol p, p')) suggest that the much greater sensitivity of  $\alpha$  scattering to multi-step processes makes the deduction of E2 and E4 excitation matrix elements less straightforward and their values less reliable than their counterparts deduced from proton scattering.

1976Ba23:  $E(\alpha)=13\text{-}24$  MeV; split-pole spectrograph + position-sensitive proportional counter;  $\theta(\text{lab})=130^\circ$ ; coupled-channel calculations; deduced interference between one- and two-step amplitudes for excitation of 489 level.

1978Bu21:  $E(\alpha)=24$  MeV; 99.06%  $^{192}\text{Os}$  target,  $\theta(\text{lab})=60^\circ\text{-}140^\circ$ , magnetic spectrograph (FWHM $\approx$ 25 keV); measured  $\sigma(\theta)$  for 1069 level.

1981Ba49:  $E(\alpha)=24$  MeV; osmium targets enriched to 98.7% in  $^{192}\text{Os}$ ; measured  $E(\text{level})$  (mag spect, proportional counter, FWHM=50 keV), angular distributions ( $50^\circ$  to  $140^\circ$ ); used coupled channels analysis to interpret data (agreement good for g.s. band, reasonable for quasi- $\gamma$  vibration band, and poor for K=4 band (bandhead at 1069 keV)).

 $^{192}\text{Os}$  Levels

| E(level) | $J^\pi$ <sup>†</sup> | $\beta_4(\text{nuclear})$ <sup>‡</sup> | Comments  |
|----------|----------------------|--|---|
| 0.0      | 0 <sup>+</sup>       |  |   |
| 206      | 2 <sup>+</sup>       |  | $\beta_2(\text{Coulomb})=0.164$ , $\beta_2(\text{nuclear})=0.14$ (from interference data) (1976Ba06). |
| 489      | 2 <sup>+</sup>       |  |   |
| 580      | 4 <sup>+</sup>       | -0.026                                 |   |
| 910      | 4 <sup>+</sup>       | +0.005                                 |   |
| 1069     | 4 <sup>+</sup>       | -0.010 <sup>#</sup>                    |   |
| 1341     | 3 <sup>-</sup>       |  |   |

<sup>†</sup> Adopted values.

<sup>‡</sup> Nuclear hexadecapole deformation parameter ( $\beta_4(\text{nuclear})/\beta_4(\text{Coulomb})=0.83$  constraint applied) from 1981Ba49. Others: 1976Ba06, 1978Bu21.

<sup>#</sup>  $\beta_4(\text{nuclear})$ : analysis of  $\sigma(\theta)$  data indicates that direct E4 excitation dominates the  $(\alpha, \alpha')$  cross section for this level, with two-step E2 excitation contributing the balance;  $\sigma(\theta)$  calculated assuming constructive interference between the E4 and E2 amplitudes did not differ sufficiently from the destructive interference case for experiment to favor one over the other (1978Bu21).