

$^{190}\text{Os}(\alpha, \alpha')$  1978Bu21, 1976Ba06

| Type            | Author   | History | Citation         | Literature Cutoff Date |
|-----------------|--|---------|------------------|------------------------|
| Full Evaluation | Balraj Singh, <sup>1</sup> and Jun Chen <sup>2</sup> |         | NDS 169,1 (2020) | 15-Oct-2020            |

**1978Bu21:** E=24 MeV  $\alpha$  beam was produced from the McMaster University tandem Van de Graaff accelerator. Target was  $\approx 40 \mu\text{g}/\text{cm}^2$  osmium metal (97.8% enriched  $^{190}\text{Os}$ ) on a carbon backing. Reaction products were momentum-analyzed with an Enge split-pole magnetic spectrograph (FWHM $\approx 25$  keV) and detected with photographic emulsions. Measured  $\sigma(\theta)$  at  $\theta=60^\circ$  to  $140^\circ$  for 1163 level. Deduced hexadecapole deformation from coupled-channel analysis.

**1976Ba06:** E=13-24 MeV alpha beams from the Rutgers-Bell FN tandem. Measured  $\sigma$  at  $130^\circ$  (lab) with a split-pole magnetic spectrograph (FWHM $\approx 40$  keV). Deduced deformation parameters from coupled-channel analysis. B(E2) and B(E4) values deduced from data at 13 MeV.

 $^{190}\text{Os}$  Levels

| E(level) <sup>†</sup> | J $\pi$ <sup>‡</sup> | Comments  |
|-----------------------|----------------------|---|
| 0                     | 0 <sup>+</sup>       |   |
| 187                   | 2 <sup>+</sup>       | $\beta_2(\text{Coulomb})=0.181$ , $\beta_2(\text{nuclear})=0.130$ or $0.141$ (1976Ba06).  |
| 548                   | 4 <sup>+</sup>       |   |
| 558                   | 2 <sup>+</sup>       |   |
| 959                   | 4 <sup>+</sup>       |   |
| 1164                  | 4 <sup>+</sup>       | A detailed analysis of $\sigma(\theta)$ data with coupled-channel calculations by 1978Bu21 gives a strong evidence for E4 excitation, thus identifying this state as due to hexadecapole vibrations. $\beta_4=0.019$ (1978Bu21) (for pure E4 excitation). The authors also give $\beta_4=0.0163$ (for constructive interference) and $0.0230$ (for destructive interference) when both modes of excitation (E4 and 2-step E2) are considered. |
| 1390                  |                      |   |

<sup>†</sup> From 1976Ba06.

<sup>‡</sup> From the Adopted Levels.