

Static Electric Quadrupole Moments in the Ground State and $K = 4_1^-$ Bands in ^{168}Er

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The time differential perturbed angular correlation (TDPAC) technique has been used to study the nuclear quadrupole interactions of the first excited state of ground state rotational band (2_1^+ , 80 keV, $T_{1/2} = 1.88$ ns) and the band head of the $K = 4_1^-$ band (4_1^- , 1094 keV, $T_{1/2} = 120$ ns) in the ^{168}Er nucleus of a polycrystalline Er host. At room temperature we obtained the electric quadrupole interaction frequencies $\omega_0(K = 0) = 457(15)$ Mrad/s and $\omega_0(K = 4) = 69(2)$ Mrad/s, respectively, for the 2_1^+ and 4_1^- isomeric states of ^{168}Er . The ratio of the spectroscopic quadrupole moments, i. e. $Q_s(K = 4)/Q_s(K = 0) = 0.69(3)$, is independent of any model approximation and the electric field gradient at ^{168}Er in the host metal.

Key words: Hyperfine Interactions; TDPAC Technique; Quadrupole Moments.