

Quadrupole Interactions of the Short-lived β -Emitter ^{16}N in TiO_2

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Quadrupole interactions of $^{12,14}\text{N}$ in BN(hexagonal) crystal were studied by detecting β -NQR of ^{12}N and FT-NMR of ^{14}N , respectively. β -NMR of $^{16}\text{N}(I^\pi = 2^-, T_{1/2} = 7.13 \text{ s})$ in MgO crystal was detected to determine the magnetic moment to be $|\mu(^{16}\text{N}: 2^-)| = (1.986 \pm 0.001) \mu_{\text{N}}$. Also, the β -NQR's of $^{12,16}\text{N}$ in TiO_2 crystal were detected to be $|Q(^{16}\text{N}: 2^-)| = (17.9 \pm 1.7) \text{ mb}$. An abnormally small effective charge for neutrons is required to account for $|Q(^{16}\text{N}: 2^-)|$.

Key words: Quadrupole Moments; N in TiO_2 ; FT- and β -NMR; Effective Charges of Nucleons in the Nucleus.