FT-NMR Detection of $^{45}$Sc, $^{49}$Ti and $^{93}$Nb in TiO$_2$ Single Crystal*


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In order to determine the electric quadrupole moment of the short-lived $\beta$-emitter $^{41}$Sc from the quadrupole coupling constant in TiO$_2$, we measured the field gradient by detecting the Fourier-Transformed-NMR of stable isotope $^{45}$Sc doped in TiO$_2$. Also, in order to study the electronic structure of impurities systematically, EFGs were measured for $^{45}$Sc, $^{49}$Ti and $^{93}$Nb in a TiO$_2$ single crystal.

Key words: TiO$_2$; $^{41}$Sc; Quadrupole Moment; Transition Metal Impurity; Electric Field Gradient.

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