NMR Detection of Oxygen Isotopes in TiO$_2$ Single Crystal*


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We studied the electric quadrupole interactions of Oxygen isotopes in a TiO$_2$ single crystal. For $^{13}$O and $^{19}$O nuclei, quadrupole coupling constants were measured by the $\beta$-NMR technique, and for the $^{17}$O nucleus the FT-NMR technique was utilized. We synthesized a TiO$_2$ single crystal which was enriched in $^{17}$O up to 5 atom % to observe NMR signals without any perturbations from impurities. Using the known quadrupole moment of $^{17}$O, EFGs at an O site in TiO$_2$ and the quadrupole moments of $^{13}$O and $^{19}$O were determined.

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