Nuclear Quadrupole Interaction at $^{187}W(\beta^{-})^{187}Re$

in Tungsten Compounds

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Z. Naturforsch. 53a, 323–339 (1998); received January 26, 1998

The nuclear quadrupole interaction at $^{187}W(\beta^{-})^{187}Re$ was determined by time differential perturbed angular correlation in WC, WS$_2$, WSe$_2$, WSi$_2$, and CaWO$_4$ to be (at 300 K): $\nu_Q = 335.9(2)$, $1094.9(1)$, $1031.6(1)$, $1131.5(1)$, and $1085.9(1)$ MHz, respectively. The asymmetry parameter $\eta$ was zero in all cases. For WSe$_2$ and CaWO$_4$ the temperature dependence of the nuclear quadrupole interaction was determined between 300 K and about 900 K. Ab initio calculations of electric field gradients, using the WIEN95-code, were carried out for WC, WS$_2$, WSe$_2$, and WSi$_2$ at W-sites and Re-impurities, and for CaWO$_4$ at W-sites. Good agreement with experimental data was found.

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