

The Nuclear Quadrupole Interaction of $^{204\text{m}}\text{Pb}$ in Cadmium

Monitored by γ - γ -Perturbed Angular Correlations

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For the first time the nuclear probe $^{204\text{m}}\text{Pb}$ was produced at the on-line isotope separator ISOLDE at CERN and used for time differential perturbed angular correlation experiments. The electric field gradient of $^{204\text{m}}\text{Pb}$ at room temperature in Cd metal was determined to be $V_{zz} = 19(1) \cdot 10^{21} \text{ V/m}^2$. *Ab initio*-calculations of the electric field gradient for the impurities Pt to Bi in cadmium were performed with the full-potential linearized augmented plane waves code WIEN97 to interpret this result. For Au, Hg and Pb, where experimental results are now available, these agree with the calculations within 10 %.

Key words: Nuclear Quadrupole Interaction; Electric Field Gradient; Perturbed Angular Correlation (PAC); ab-initio Calculations.