PAC Identification of Electric-Nuclear-Quadrupole Interactions in Sm-Sesquioxides

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Z. Naturforsch. **55 a,** 155–159 (2000); received August 26, 1999

Presented at the XVth International Symposium on Nuclear Quadrupole Interactions, Leipzig, Germany, July 25 - 30, 1999.

We present Perturbed Angular Correlation (PAC) results of the electric-nuclear quadrupole interaction at ^{181}Ta located at the nonequivalent cation sites of cubic C-Sm_2O_3 and monoclinic B-Sm_2O_3 free of defects. The application of the empirical Cd/Ta correlation found in binary oxides allowed us to correlate the interactions with each site and to identify the single Sm site populated in ^{111}In-implanted B-Sm_2O_3 experiments. The preferential site occupation of Cd and Ta in B-Samaria is discussed in terms of the "chemistry" of the probe-atoms.

Key words: Perturbed-Angular Correlations; Electric-Field Gradients; Sm_2O_3; Rare-earth Semiconductor and Insulator Oxides; ^{181}Hf-Impurity Implantation.