

Phase Transitions in Oxides Studied by Perturbed Angular Correlation Spectroscopy

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Radioactive atoms located on cation sites in oxide matrices can be used to monitor phase transitions by measuring the electric or magnetic hyperfine interactions by means of Perturbed Angular Correlations spectroscopy. The article illustrates three types of phase transitions studied with ^{111}In tracers and their daughter nuclei ^{111}Cd , namely magnetic, structural and REDOX phase transitions in binary and ternary polycrystalline or single-crystalline oxides. In this context, we also discuss the question of identifying the probes' lattice site(s), the scaling of the Electric Field Gradients in oxides, the influence of the (impurity) probes themselves on the phase transitions, and the occurrence and mechanisms of dynamic interactions. Recent results on ^{111}In in pure and Li-doped In_2S_3 will also be presented.

Key words: Phase Transitions; Oxides; Perturbed Angular Correlations; ^{111}In ; Point Charge Model.