

Abstract Submitted
for the OSS05 Meeting of
The American Physical Society

The Electrical Field Gradient at ^{181}Ta in ZrSiO_4 and HfSiO_4 SEAN MCBRIDE, HERBERT JAEGER, Miami University — We have used perturbed angular correlation spectroscopy (PAC) to measure the electric field gradient (*EFG*) at the *Zr*-site in zircon (ZrSiO_4) between room temperature and 1100°C using ^{181}Ta probe nuclei. The *EFG* is axially symmetric and the quadrupole interaction frequency ν_Q decreases linearly with increasing temperature. While for some zircon specimens the slope of the ν_Q vs. T increases above 900°C , for others this change in slope is not observed. This change in the thermal behavior ν_Q is consistent with a displacive structural transition reported in the literature.¹ In order to learn more about this structure we have begun performing PAC experiments on isostructural hafnon (HfSiO_4), which was synthesized in our laboratory. PAC spectra of hafnon are very similar to those of zircon but show a small second-site interaction due to residual HfO_2 from the sample preparation. The temperature dependence of the quadrupole interaction frequency will be discussed in context of a displacive phase transition in these materials.

¹Z. Mursic, T. Vogt, and F. Frey, Acta Cryst. **B48** (1992) 584.

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Date submitted: 14 Mar 2005

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