

## Characterization of quartz by lattice defects: Physical properties of lattice defect centers produced by high energy particles

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Lattice defects in quartz have a direct influence on dislocation slip or diffusion in plastic deformation. In order to characterize quartz by lattice defects, I analyzed ESR (electron spin resonance) signals produced by irradiation of high energy particles (fast neutrons and alpha-rays). As a result, I detected an unknown ESR signal at  $g=2.0050$ , besides intrinsic lattice defect centers in quartz such as E' and peroxy centers derived from oxygen vacancies and interstitials. The unknown signal is detectable also from quartz grains in fault gouge which has high concentrations of U and Th, so that it may be a superoxide or ozonide radical produced in depleted zones in quartz, which are formed by knock-on with high energy particles.