

Raman spectroscopy of heavy ion induced damage in cordierite

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Natural cordierite crystals were irradiated with Xe ions of 1.465 GeV kinetic energy and fluences ranging from 10^8 to 10^{12} ions/cm². Raman spectra of the surface and line scans along the trajectory of the ions have been recorded. At a fluence of 10^{12} ions/cm² the colour of the originally blue sample changed to yellow and the Raman spectrum shows distinct band broadening. Irradiation also alters the content and nature of volatiles (CO₂, H₂O) incorporated into structural channels. Similar effects have been described for cordierite affected by natural irradiation from α decay processes.