

Heavy-ion induced damage in fluorite nanopowder

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Compressed pellets of 40 nm sized CaF_2 powder were exposed to Pb ions of about 4 MeV/u. The structural change of the irradiated crystals was monitored by in situ X-ray diffraction experiments. The evolution of the diffraction spectra as a function of the ion fluence gives evidence for two different phenomena: (1) the area of the diffraction peaks slowly decreases due to the loss of the crystalline phase of CaF_2 , and (2) the width of the peaks broadens at a much faster rate. We assume that this latter observation can be ascribed to a grain breaking process.