

# Structural and chemical properties of superconducting Co-doped BaFe<sub>2</sub>As<sub>2</sub> thin films grown on CaF<sub>2</sub>

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## Video description

The two videos show electron-beam induced damage of Co-doped BaFe<sub>2</sub>As<sub>2</sub> thin films on CaF<sub>2</sub> substrates. File 1 (“Irradiation-damage-Ba122-STEM.mp4”) shows the destruction of an undamaged sample region under a high electron dose (roughly 1 nA beam current) in STEM imaging mode. The formation of a reaction layer with amorphous structure at the interface is visible. In addition, an ordered lattice of F gas bubbles is also forming in the CaF<sub>2</sub> region [1,2].

File 2 (“Prolonged\_Irradiation\_200s\_TEM\_BrightField.mp4”) shows the formation of a damaged layer with constant thickness during prolonged irradiation (200 s) under parallel electron-beam illumination in bright-field TEM imaging mode.

- [1] Nikolaichik V I, Sobolev B P, Zaporozhets M A and Avilov A S 2012 Effect of high-energy electron irradiation in an electron microscope column on fluorides of alkaline earth elements (CaF<sub>2</sub>, SrF<sub>2</sub>, and BaF<sub>2</sub>) *Crystallogr. Reports* **57** 299–307
- [2] Johnson E and Chadderton L T 1983 Anion voidage and the void superlattice in electron irradiated CaF<sub>2</sub> *Radiat. Eff.* **79** 183–233