

Equation of state and high-pressure phase behavior of SrCO₃

Biedermann, N.^{1,2}, Bykova, E.^{3,4}, Morgenroth, W.^{2,5}, Efthimiopoulos, I.⁶, Mueller, J.⁶, Spiekermann, G.², Glazyrin, K.³, Pakhomova, A.³, Appel, K.¹ and Wilke M.²

¹European XFEL GmbH, Schenefeld, Germany

²Institute for Geosciences, University of Potsdam, Potsdam-Golm, Germany

³Deutsches Elektronen Synchrotron DESY, Hamburg, Germany

⁴Geophysical Laboratory, Carnegie Institution of Washington, Washington, D.C., USA

⁵Institute for Geosciences, Goethe University of Frankfurt, Frankfurt am Main, Germany

⁶GFZ German Research Center for Geosciences, Potsdam, Germany,

Corresponding author: Nicole Biedermann, nicole.biedermann@xfel.eu,

Supplementary material

The single crystals of pure SrCO₃ strontianite were synthesized using a Walker-type multi-anvil apparatus at 4 GPa and 1273 K for 24 h using SrCO₃ powder from Sigma Aldrich Chemical Company (99.995% purity) as starting material. The chemical composition of the synthesized crystals was determined using a JEOL Hyperprobe JXA-8500F with a field emission cathode at the GFZ Potsdam, Germany. Analysis was conducted with an acceleration voltage of 15 kV, a 10 nA beam current and a <10 µm focused beam size. Dolomite and strontianite were used as standard reference materials. Table S1 shows the chemical analyses of the samples with calculated CO₂-contents. In addition, the morphology and chemical composition of the single crystals were studied with scanning electron microscopy (Fig. S1)

Table S1: Chemical composition of synthesized strontianite samples.

The composition in wt % was determined by electron microprobe analysis. The standard deviation is given in parentheses and refers to the last printed digit.

sample	SrO [wt%]	CaO [wt%]	CO ₂
MA393-1	67.65	0.02	32.33
MA393-2	67.27	0.02	32.71
MA393-3	67.43	0.02	32.55
MA393-4	67.90	0.02	32.09
MA393-5	67.41	0.00	32.59
Average	67.5(2)	0.01(1)	32.5(2)

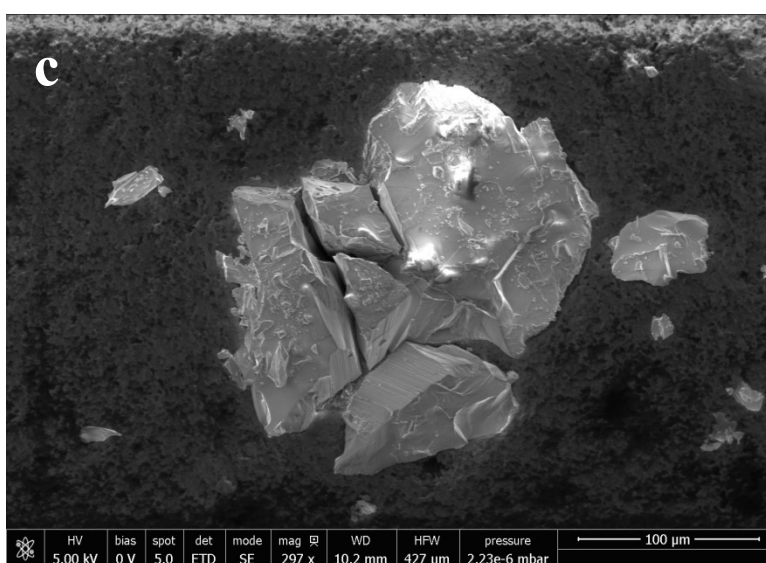
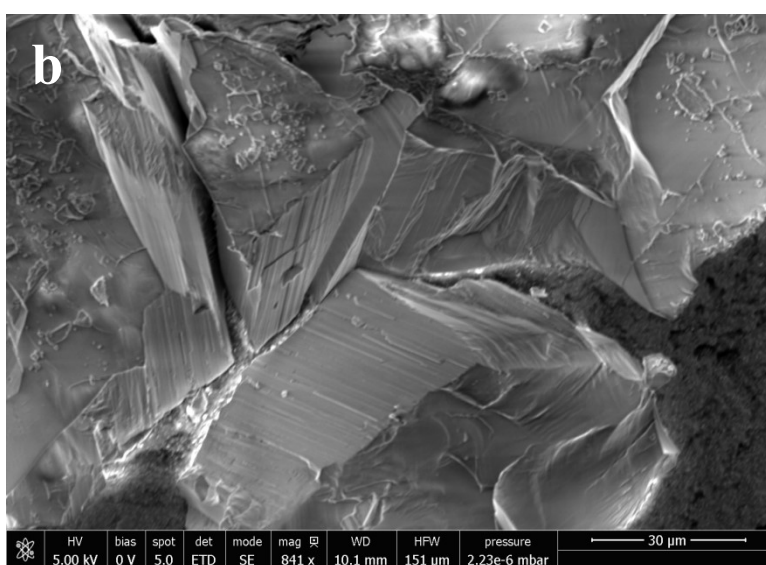
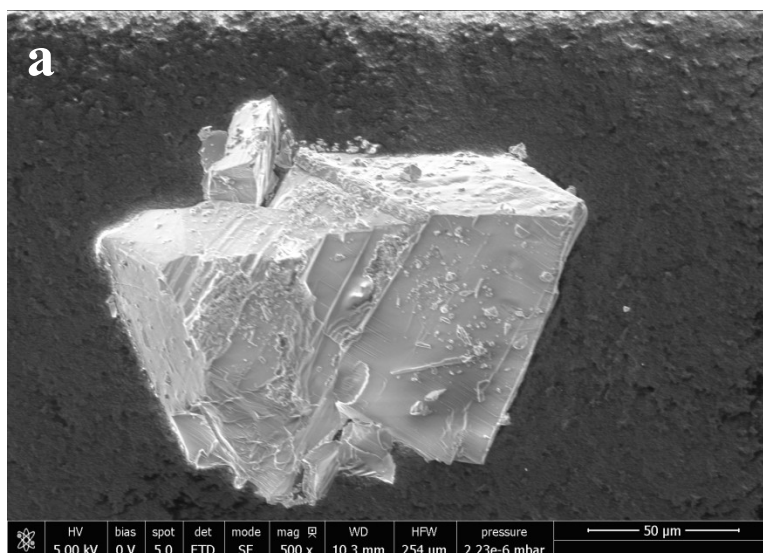


Figure S1: Scanning electron images of synthesized strontianite.
SEM imaging was performed on a QUANTA FEG 650 with 5 kV acceleration voltage.