

Supporting Information

Detailed results of the Rietveld refinements for the three powder samples: The initial powder, the powder ball milled for 10 minutes, and the powder ball milled for 20 minutes.

Table 1: Results of the Rietveld refinements from the obtained PXRD patterns.

	Initial SrFe ₁₂ O ₁₉	SrFe ₁₂ O ₁₉ ball milled 10 min	SrFe ₁₂ O ₁₉ ball milled 20 min
SrFe ₁₂ O ₁₉ (wt%)	96(1)	96(1)	95(5)
α-Fe ₂ O ₃ (wt%)	4.(1)	4(1)	5(1)
R _F (SrFe ₁₂ O ₁₉)	6.87	5.51	9.02
R _{wp} (SrFe ₁₂ O ₁₉)	18.3	19.8	7.94
SrFe ₁₂ O ₁₉ crystallite c- size (nm)	46.5(4)	40 (6)	53.4(7)
SrFe ₁₂ O ₁₉ crystallite ab- size (nm)	168(2)	148(4)	141(2)
SrFe ₁₂ O ₁₉ unit cell c-axis (Å)	23.0795(1)	23.0769(3)	23.0802(1)
SrFe ₁₂ O ₁₉ unit cell ab- axis (Å)	5.882889(2)	5.88249(5)	5.88291(2)
R _F α-Fe ₂ O ₃	8.04	28.8	13.6
α-Fe ₂ O ₃ unit cell c-axis (Å)	13.7543(3)	13.7519(8)	13.7548(4)
α-Fe ₂ O ₃ unit cell ab-axis (Å)	5.03613(6)	5.0365(2)	5.0363(1)

TEM measurements were made on the initial and ball milled powder. The images are seen in figure 1.

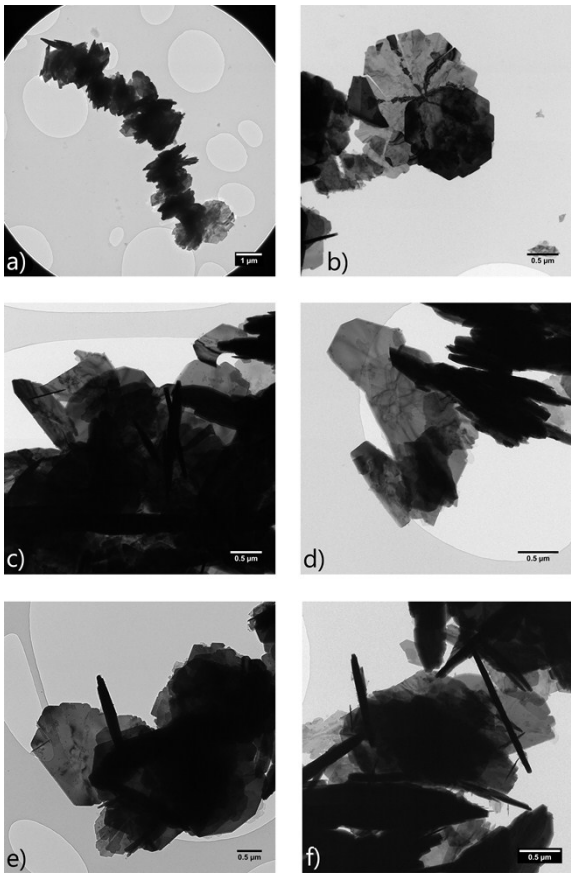


Figure 1: TEM measurements of SrFe₁₂O₁₉. a) and b): Initial powder, c) and d) powder ball milled for 10 minutes, e) and f) powder ball milled for 20 minutes.

Pole figure measurements

The obtained pole figure measurements can be seen on Figure 2, 3, and 4 showing pRT, p950, and p950_Ha.

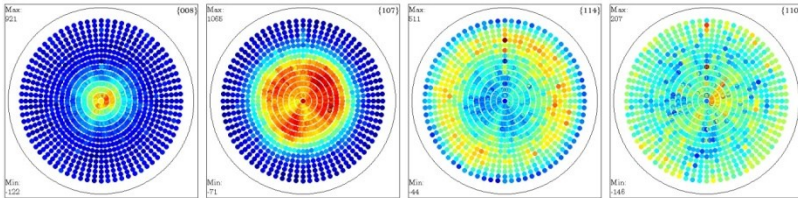


Figure 2: Pole figure measurement of pellet pRT.

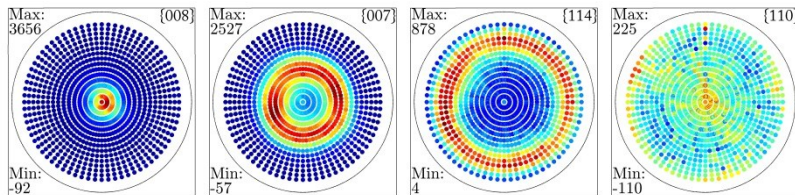


Figure 3: Pole figure measurement of p950.

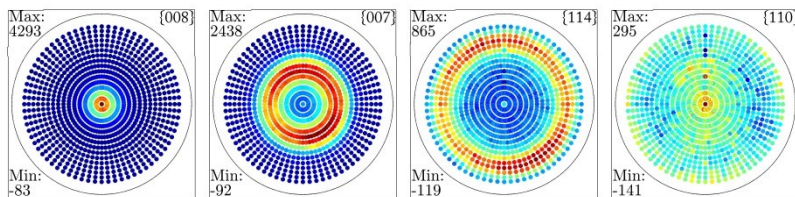


Figure 4: Pole figure measurement of p950_Ha.