

Supplementary material for
Electrical conductivity and dielectric properties of Sr doped
M-type barium hexaferrite BaFe₁₂O₁₉

Y. Marouani^{1,2}, J. Massoudi², M. Noumi², A. Benali^{1,2,3}, E. Dhahri², P. Sanguino⁴, M.P.F.

Graça³, M. A. Valente³ and B.F.O. Costa¹

1University of Coimbra, CFisUC, Physics Department, 3004-516 Coimbra, Portugal.

2Laboratoire de Physique Appliquée, Faculté des Sciences, Université de Sfax, 3000- Tunisie.

3IN and Physics Department, University of Aveiro, 3810-193, Portugal.

4University of Coimbra, CEMMPRE, Mechanical Engineering Department, 3030-788Coimbra, Portugal

*Corresponding author: Y. Marouani@gmail.com

Table S1: detailed Rietveld parameters of different samples

Sample	Fe ₂ O ₃ wt(%)	Space group	Atoms (Wyck)	x	y	z	Occupancy
X = 0	9.8	P6 ₃ /mmc	Ba (2d)	0.33333	0.66666	0.75000	0.1723 ₈
			Fe1 (12k)	0.1664 ₁	0.3328 ₃	0.6089 ₀	1.0376 ₇
			Fe2 (4f)	0.33333	0.66666	0.0282 ₅	0.3368 ₆
			Fe3 (4f)	0.33333	0.66666	0.1901 ₀	0.3429 ₇
			Fe4 (4e)	0.00000	0.00000	0.2400 ₂	0.1763 ₉
			Fe5 (2a)	0.00000	0.00000	0.00000	0.1922 ₈
			O1 (12k)	0.1623 ₃	0.3246 ₃	0.1623 ₃	1.00000
			O2 (12k)	0.5026 ₀	0.0024 ₀	0.1515 ₃	1.00000
			O3 (6h)	0.1767 ₃	0.3534 ₃	0.25000	0.50000
			O4 (4f)	0.33333	0.66666	0.5582 ₁	0.3641 ₃
			O5 (4e)	0.00000	0.00000	0.1436 ₇	0.3485 ₆
X = 0.5	8.1	P6 ₃ /mmc	Ba (2d)	0.33333	0.66666	0.75000	0.0783 ₀
			Sr (2d)	0.33333	0.66666	0.75000	0.0833 ₃
			Fe1 (12k)	0.1672 ₉	0.3345 ₉	0.6086 ₄	1.0376 ₇
			Fe2 (4f)	0.33333	0.66666	0.0269 ₆	0.3225 ₉
			Fe3 (4f)	0.33333	0.66666	0.1901 ₅	0.3394 ₀
			Fe4 (4e)	0.00000	0.00000	0.2422 ₄	0.1750 ₃
			Fe5 (2a)	0.00000	0.00000	0.00000	0.1805 ₇
			O1 (12k)	0.1654 ₆	0.3309 ₁	0.0524 ₅	1.00000
			O2 (12k)	0.5323 ₅	0.0242 ₂	0.1520 ₄	1.00000
			O3 (6h)	0.1767 ₀	0.3533 ₇	0.25000	0.50000
			O4 (4f)	0.33333	0.66666	0.5564 ₈	0.3315 ₁
O5 (4e)	0.00000	0.00000	0.1455 ₃	0.2996 ₉			
			Sr (2d)	0.33333	0.66666	0.75000	0.1604 ₅
			Fe1 (12k)	0.1701 ₆	0.3403 ₁	0.60910	1.00000
			Fe2 (4f)	0.33333	0.66666	0.0271 ₃	0.3315 ₅
			Fe3 (4f)	0.33333	0.66666	0.1905 ₈	0.3340 ₅

X = 1	4.7	P6₃/mmc	Fe4 (4e)	0.00000	0.00000	0.2442₉	0.1687₆
			Fe5 (2a)	0.00000	0.00000	0.00000	0.1728₈
			O1 (12k)	0.1599₃	0.3198₄	0.0528₀	1.00000
			O2 (12k)	0.4745₅	0.0113₃	0.1516₂	1.00000
			O3 (6h)	0.1849₅	0.3698₆	0.25000	0.50000
			O4 (4f)	0.33333	0.66666	0.5561₆	0.3276₆
			O5 (4e)	0.00000	0.00000	0.1497₃	0.3276₆

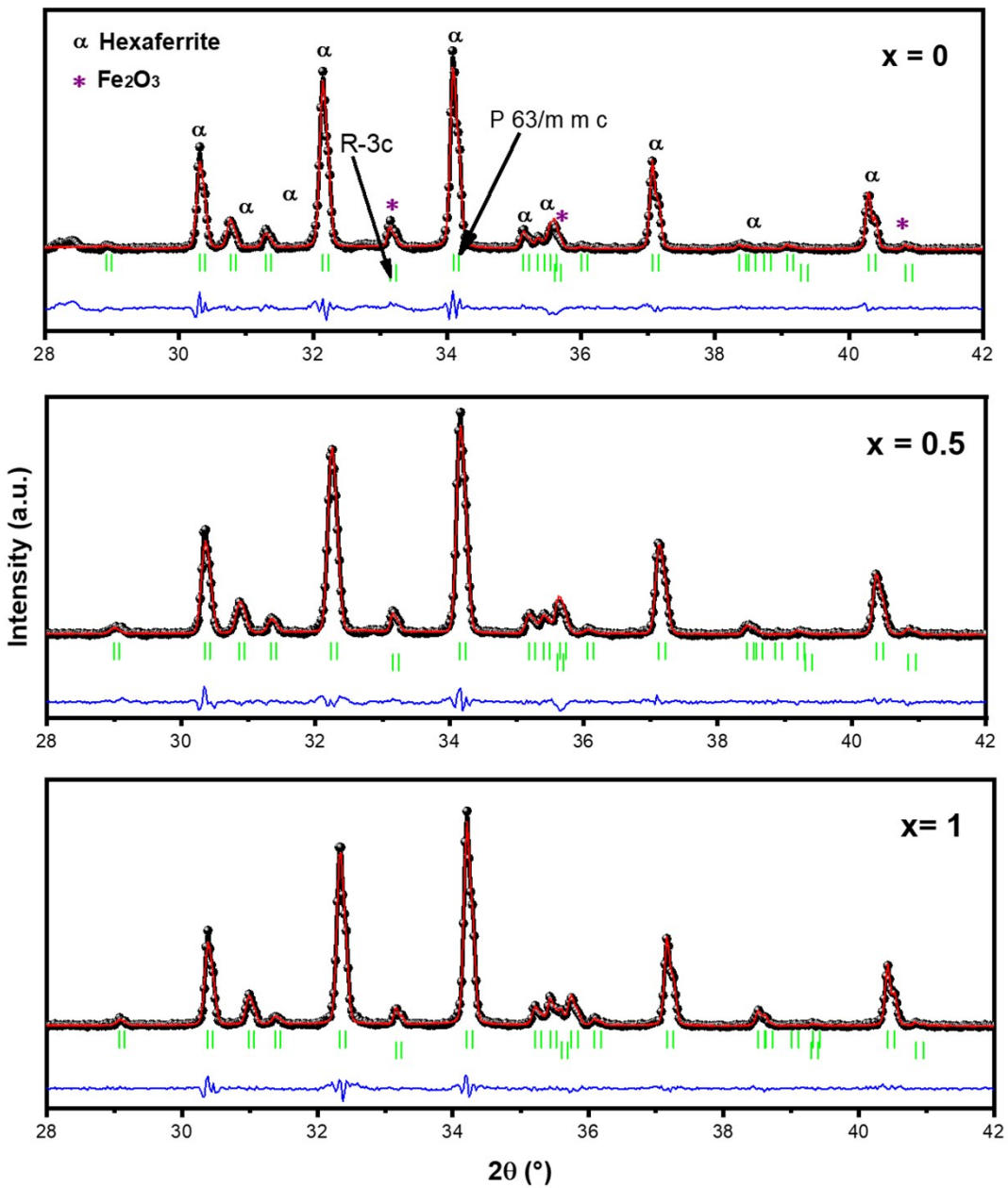


Figure S1: Zoomed views in the 2θ interval of 28–42 ($^\circ$). These Bragg peaks are referred to the space group R-3C and $P6_3/mmc$ for Fe_2O_3 and $\text{ba}_{1-x}\text{Sr}_x\text{Fe}_{12}\text{O}_{19}$ respectively.

4. Full details of what was refined needs to be provided. Errors need to be added to the refined parameters. Goodness of fit parameters should also be given along with the refinements for all materials (some of these could be in an ESI).

Our response:

Full details of what was refined needs and errors have been provided (see please Table1 and TableS1).

5. It would be useful to see a zoomed in region so that the impurity can be seen. Have the authors tried a 2 phase refinement which would give them relative amounts of the phases?

Our response:

Zoomedviews in region so that the impurity can be seen and the relative amounts of the phases has been added (see please Fig.S1 and Table S1 in Supplementary material).