

Supplementary information for

Synthesis of porous high-temperature superconductors *via* a melamine formaldehyde sacrificial template

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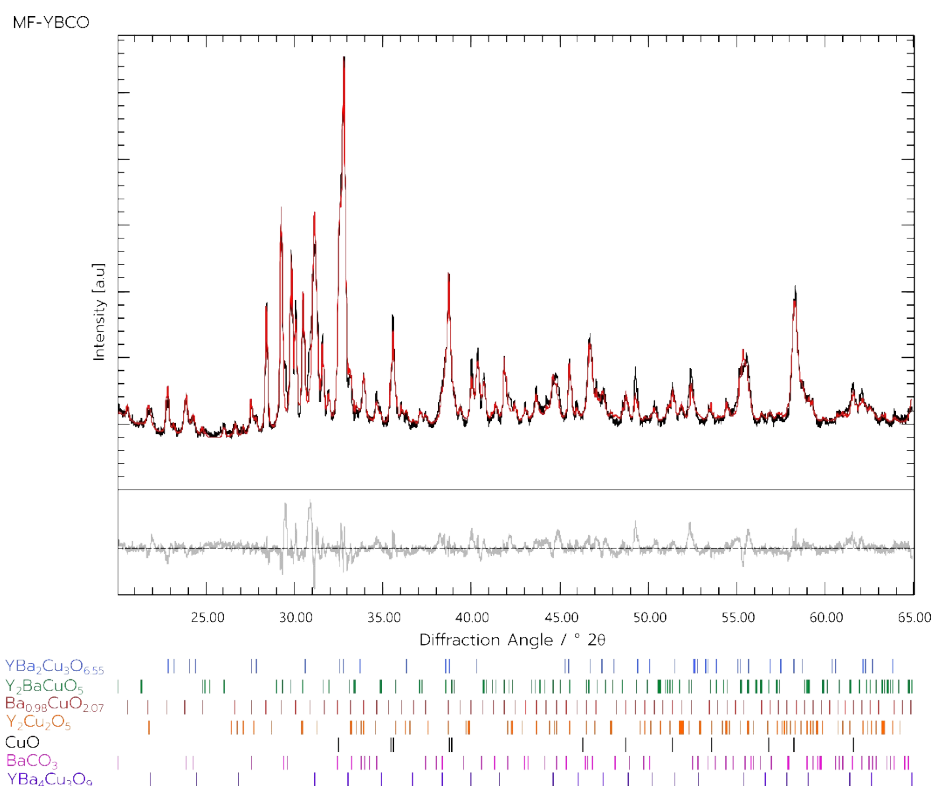


Figure S1 – YBCO MF sponge only (MF-YBCO), refined PXRD pattern with $R_{wp} = 6.93\%$. Observed data points and calculated pattern are shown as black and red, respectively.

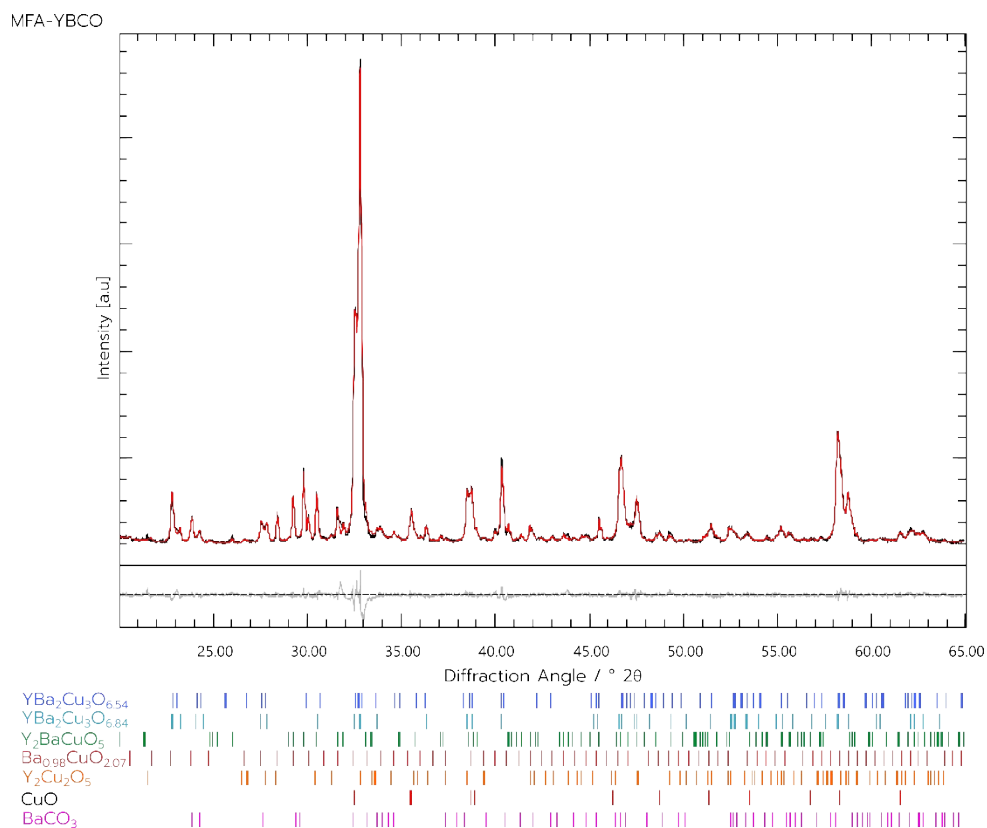


Figure S2 – YBCO sodium alginate only (MFA-YBCO), refined PXRD pattern with $R_{\text{wp}} = 4.01\%$. Observed and calculated plots are shown as black and red, respectively.

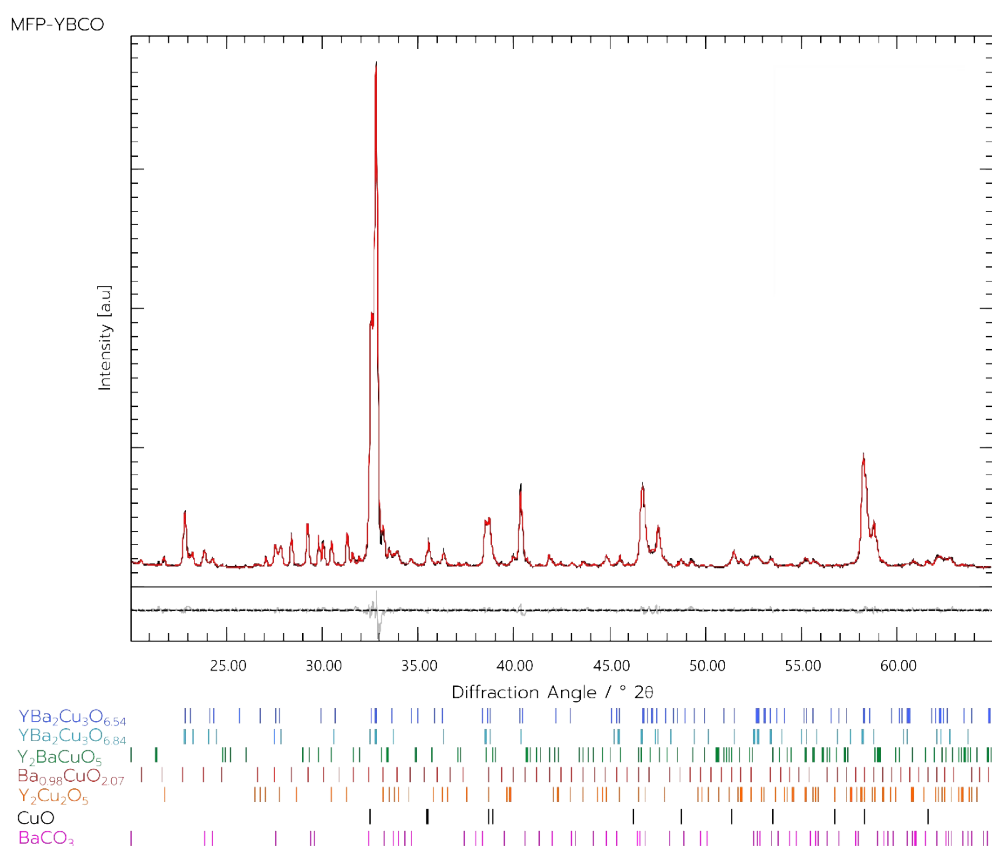


Figure S3 – YBCO Pechini synthesis with the MF sponge (MFP-YBCO) refined PXRD pattern with $R_{\text{wp}} = 3.37\%$. Observed and calculated plots are shown as black and red, respectively.

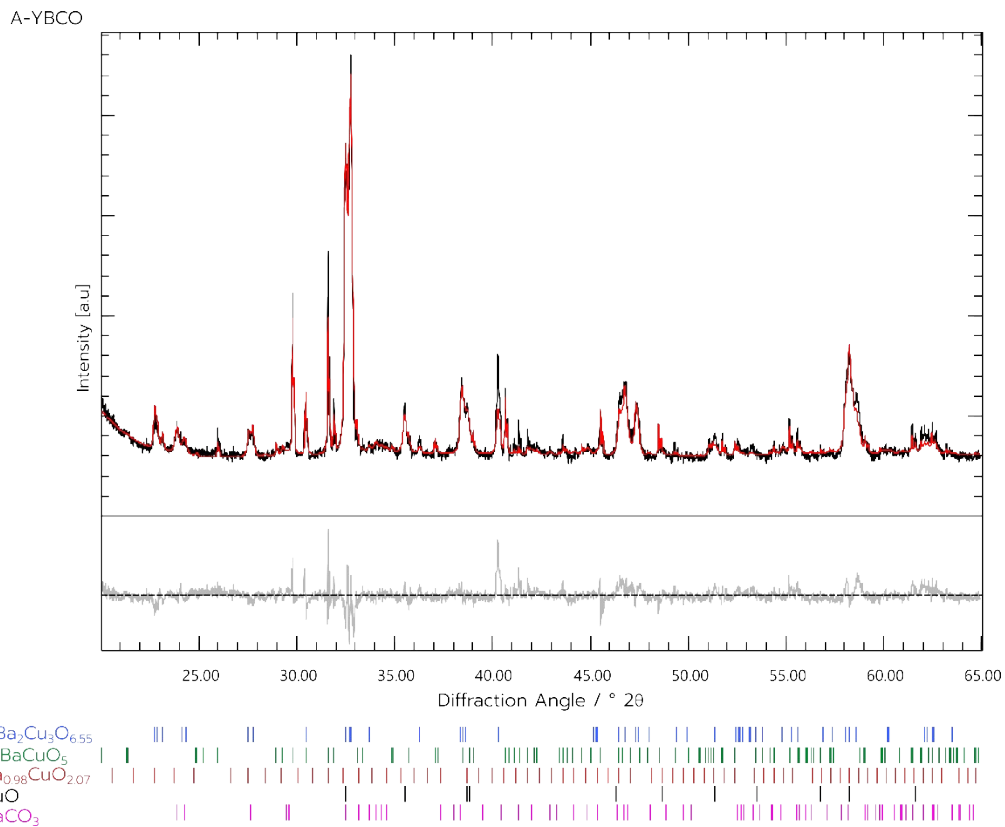


Figure S4 - YBCO Alginate-only control synthesis $R_{wp} = 7.21\%$. Observed and calculated plots are shown as black and red, respectively.

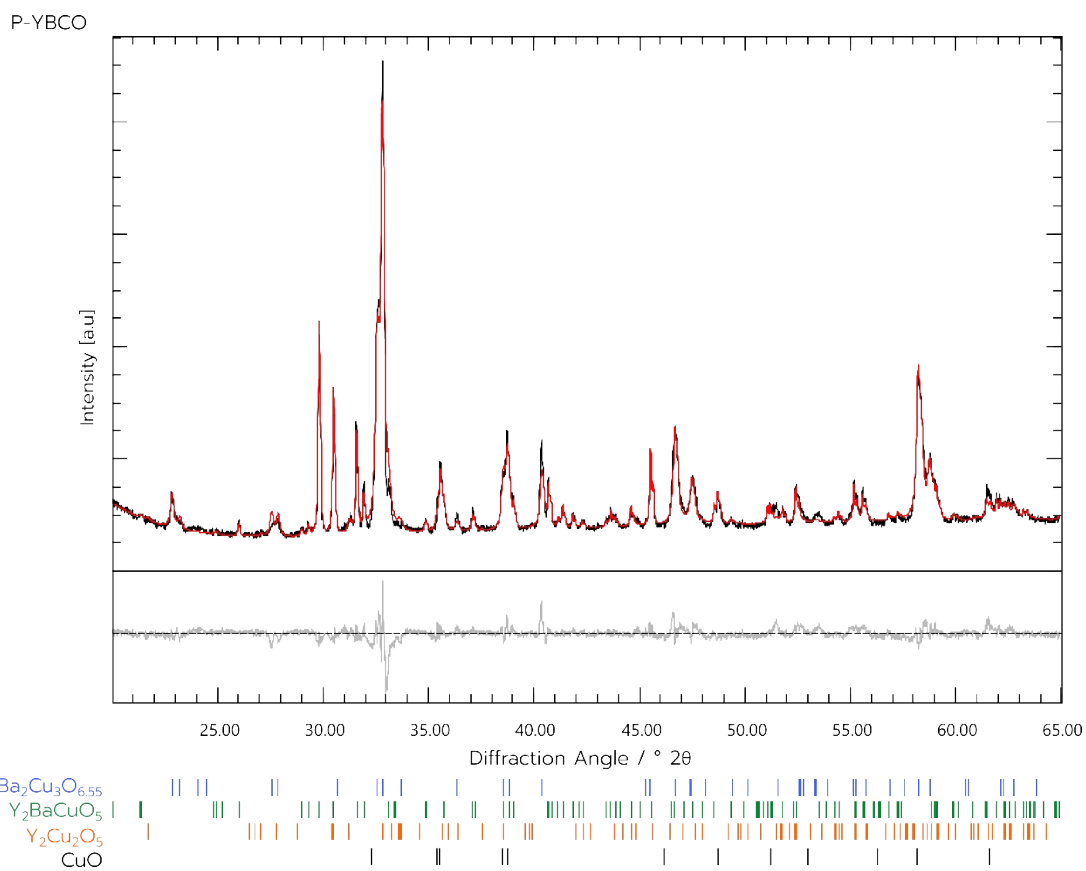


Figure S5 – YBCO Pechini method control synthesis $R_{wp} = 6.45\%$. Observed and calculated plots are shown as black and red, respectively.

Phase	MF Only Quantity / %	Alginate method Quantity / %	Pechini method Quantity / %	Alginate only control Quantity / %	Pechini only control Quantity / %	ICSD reference code
YBa ₂ Cu ₃ O _{6+δ}	36	65	69	59	50	79050 / 173898 / 83061
Y ₂ BaCuO ₅	17	13	4	18	22	10883
Ba _{0.98} CuO _{2.07}	18	8	9	0	0	202998
Y ₂ Cu ₂ O ₅	4	1	8	0	4	72058
CuO	12	9	7	16	23	87126
BaCO ₃	4	4	3	6	0	15196
YBa ₄ Cu ₃ O ₉	9	0	0	0	0	65867

Table S1 - Table of YBCO phases as determined by multi-phase Rietveld refinement

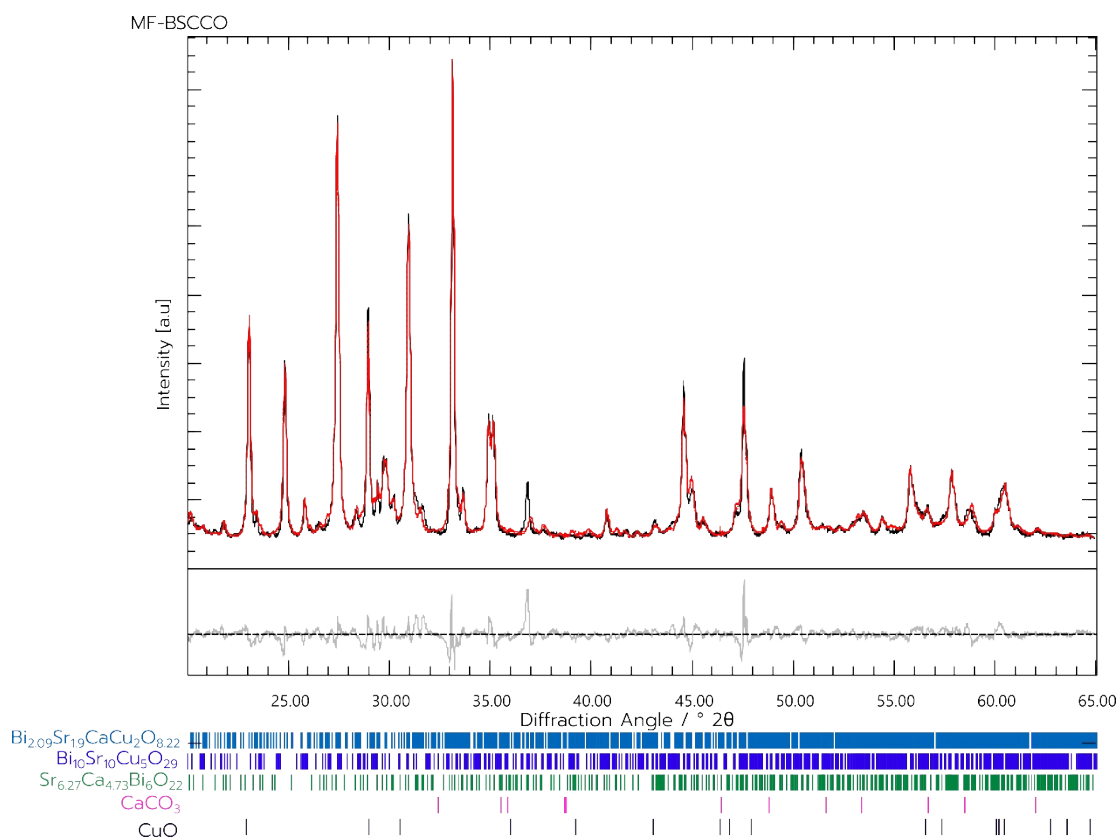


Figure S6 - BSCCO MF sponge only (MF-BSCCO) refined PXRd pattern $R_{wp} = 8.93\%$. Observed and calculated plots are shown as black and red, respectively.

MFA-BSCCO

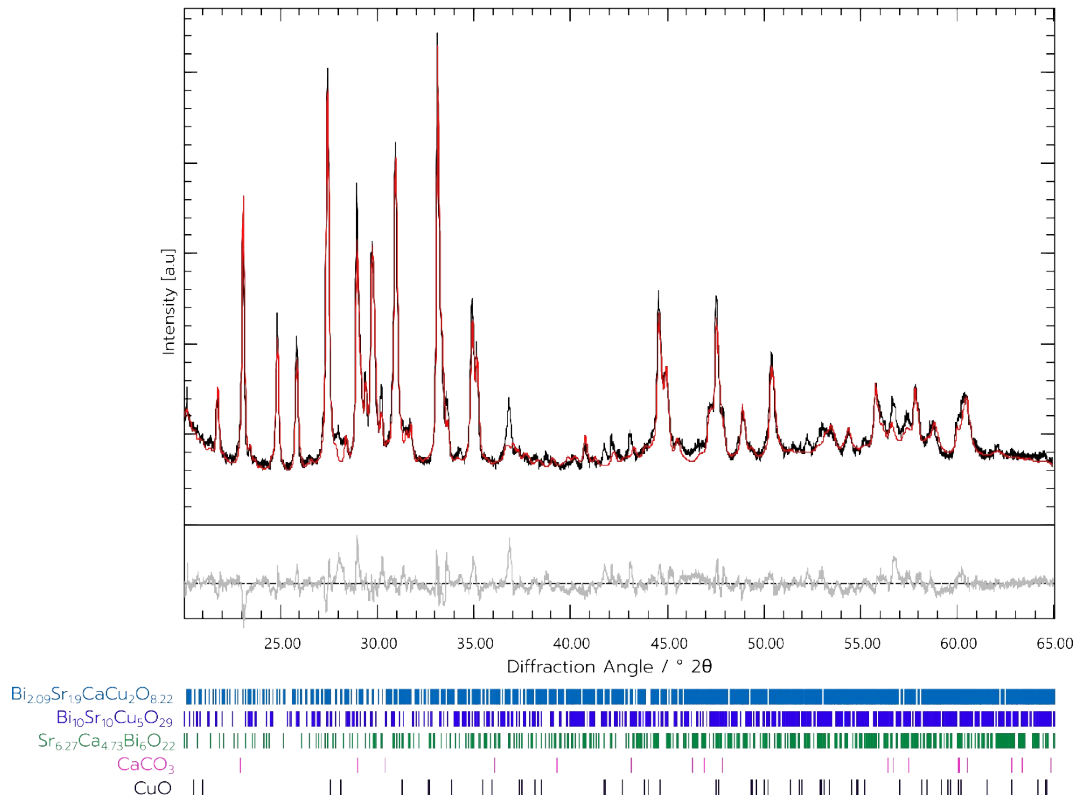


Figure S7 - BSCCO alginate and MF sponge method (MFA-BSCCO) refined PXRDR pattern, $R_{\text{wp}} = 7.72\%$. Observed and calculated plots are shown as black and red, respectively.

MFP-BSCCO

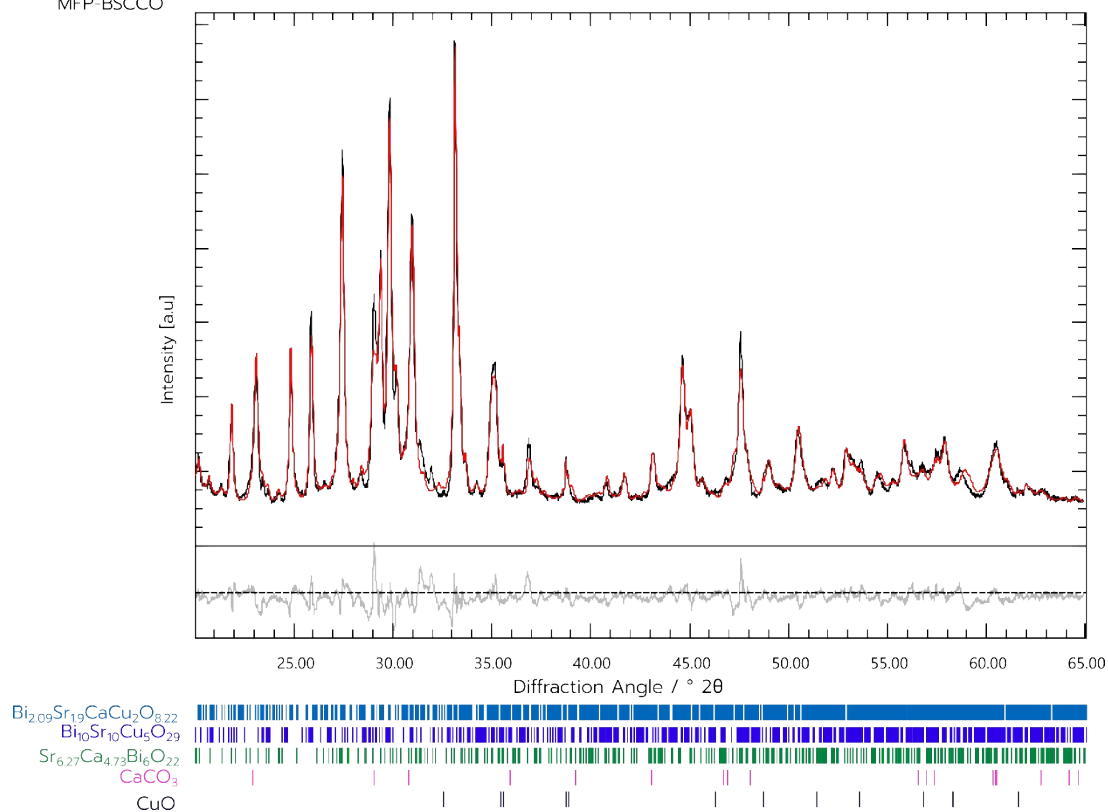


Figure S8 - BSCCO Pechini synthesis with the MF sponge (MFP-BSCCO) refined PXRDR pattern, $R_{\text{wp}} = 7.57\%$. Observed and calculated plots are shown as black and red, respectively.

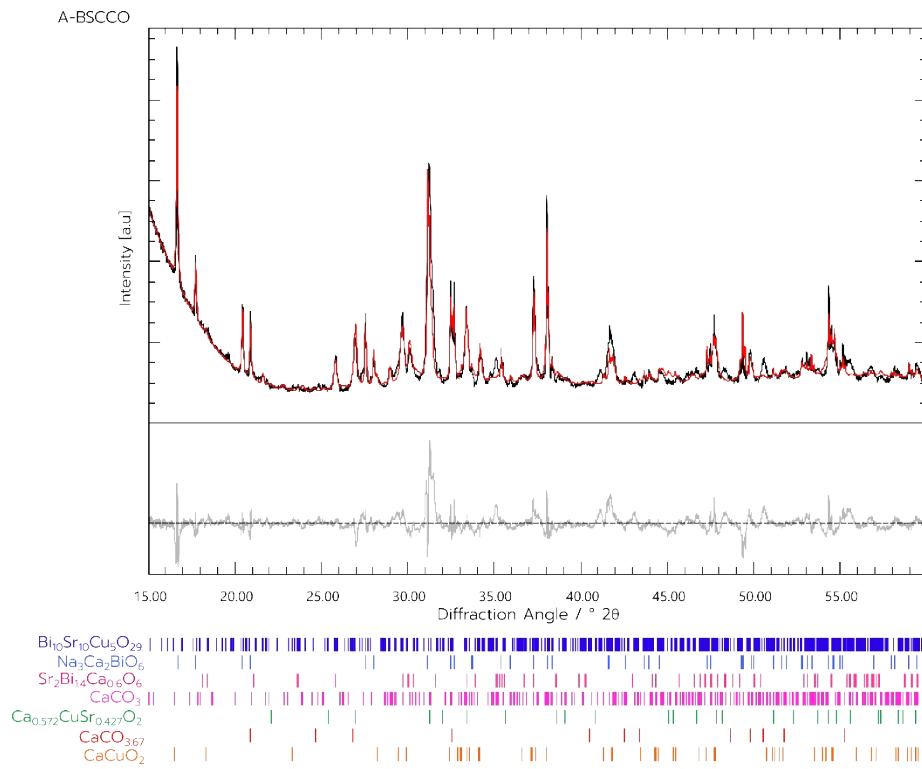


Figure S9 – BSCCO alginate only control synthesis $R_{wp} = 10.63\%$. Observed and calculated plots are shown as black and red, respectively.

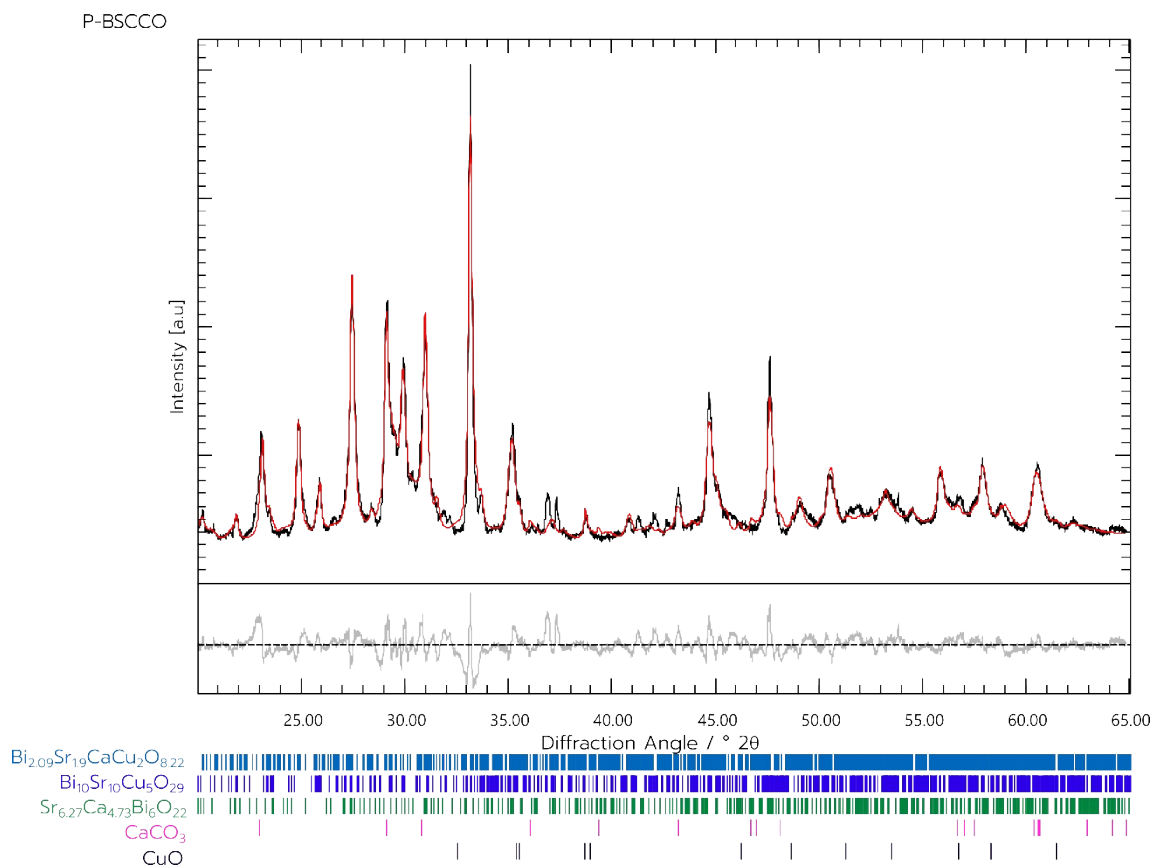


Figure S10 – BSCCO Pechini only control experiment $R_{wp} = 9.46\%$. Observed and calculated plots are shown as black and red, respectively

Phase	MF Only	Alginate	Pechini	Alginate only	Pechini method only	ICSD reference code
	Quantity / %	method	method	control	control	
		Quantity / %	Quantity / %	Quantity / %	Quantity / %	
$\text{Bi}_{2.09}\text{Sr}_{0.9}\text{CaCu}_2\text{O}_{8.22}$	86	65	56	-	63	203210
$\text{Bi}_{10}\text{Sr}_{10}\text{Cu}_5\text{O}_{29}$	6	17	17	5	6	65557
$\text{Sr}_{6.27}\text{Ca}_{4.73}\text{Bi}_6\text{O}_{22}$	6	5	14	-	15	56774
CaCO_3	2	14	11	44	12	191880
CuO	0	0	3	-	3	16025
$\text{Na}_3\text{Ca}_2\text{BiO}_6$	-	-	-	23	-	240975
$\text{Ca}_{0.573}\text{CuO}_2\text{Sr}_{0.427}$	-	-	-	6	-	77286
CaCuO_2	-	-	-	17	-	84868
$\text{Ca}(\text{CO}_3)_{0.67}$	-	-	-	6	-	130016

Table S2 - Table of BSCCO phases as determined by multi-phase Rietveld refinement

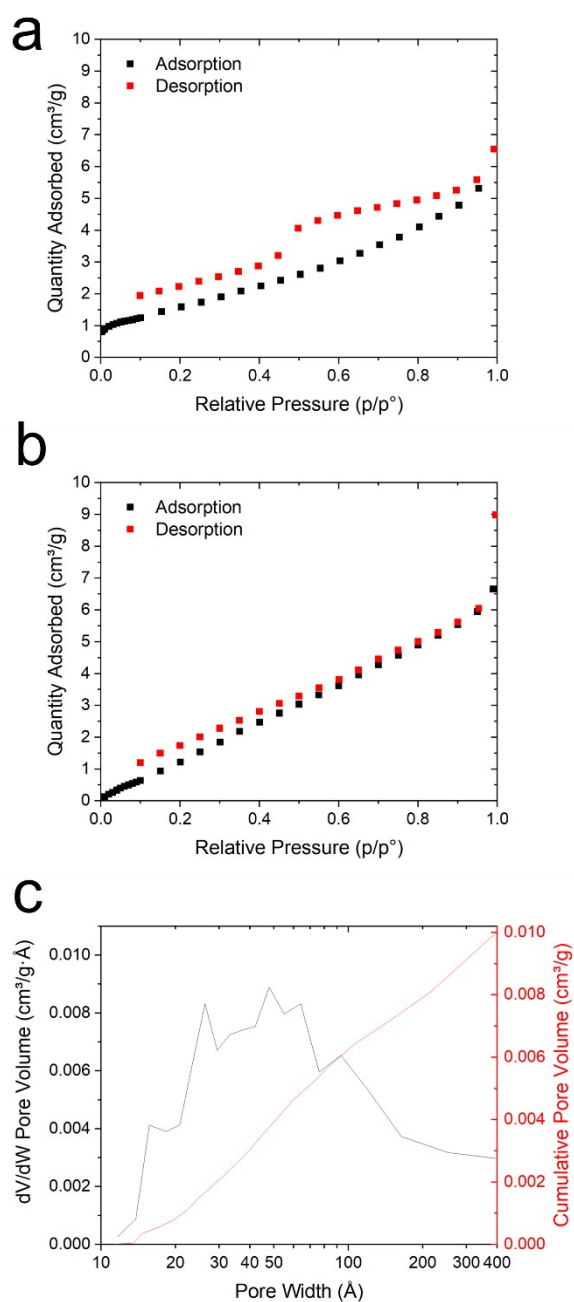


Figure S11: - N₂ gas sorption isotherms of a) MFP-YBCO sponges and b) MFP-BSCCO sponges. c) BJH pore size distribution for YBCO

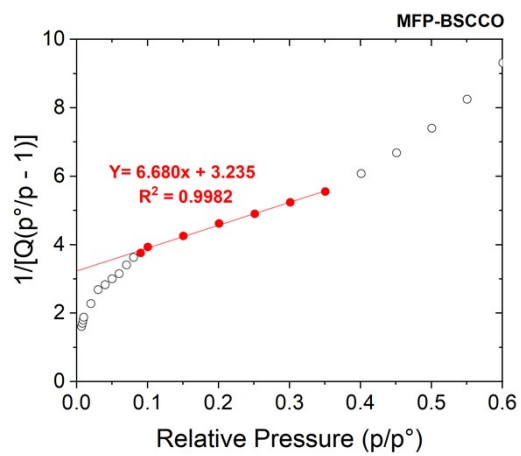
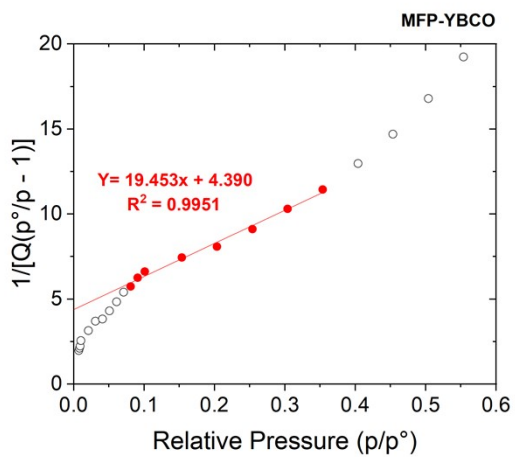


Figure S12: BET Plots for typical MFP-YBCO (A) and MFP-BSCCO (B) samples.