

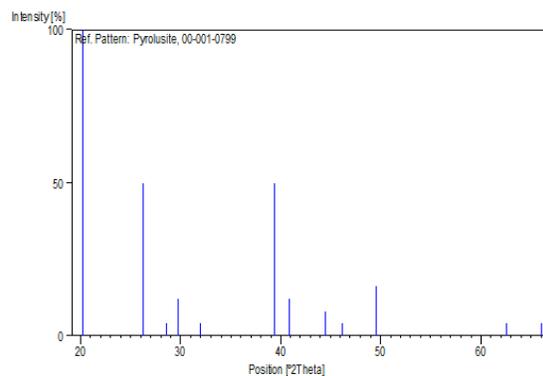
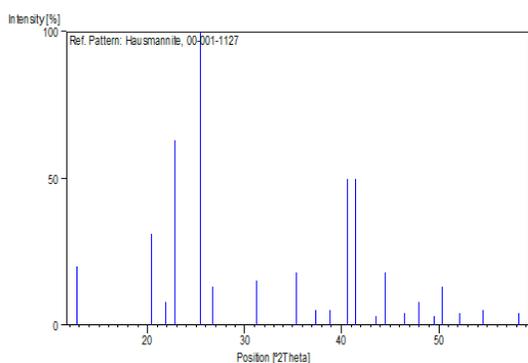
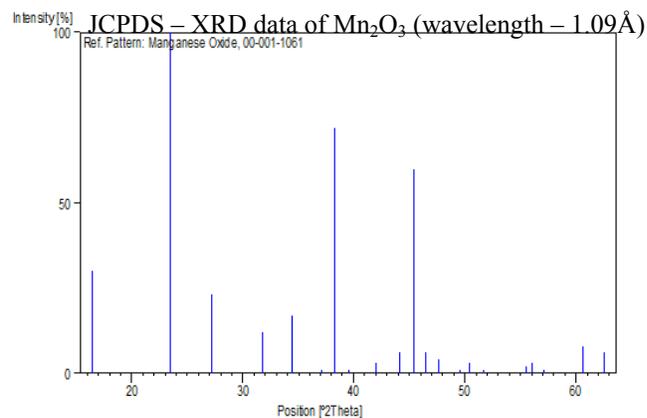
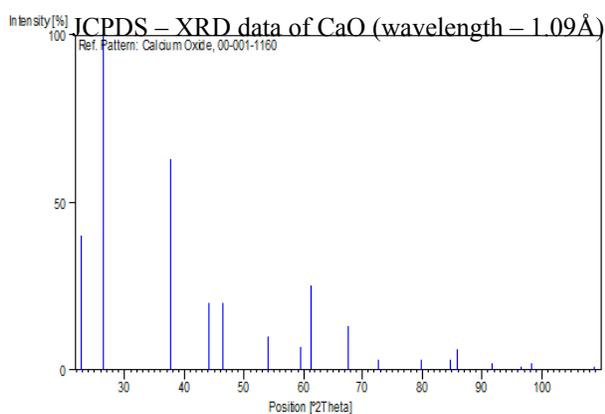
Supplementary information :

Structural, transport, magnetic and magnetoelectric properties of $\text{CaMn}_{1-x}\text{Fe}_x\text{O}_{3-\delta}$ ($0.0 \leq x \leq 0.4$)

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JCPDS – XRD data of Mn_3O_4 (wavelength – 1.09Å)

JCPDS – XRD data of MnO_2 (wavelength – 1.09Å)

Table II: Comparison of the reported in literature (calculated and experimentally recorded frequencies of the Raman – active modes in LaMnO₃, CaMnO₃) with Mn⁺³/Mn⁺⁴ mixed valences containing CaMnO_{3-δ}. * frequencies are observed because of (Mn⁺³ – O) vibrations. Bold Frequencies in bold fonts indicate Raman lines with highest intensity.

Mode Symmetry	LaMn ⁺³ O ₃		CaMn ⁺⁴ O ₃		CaMn ^{+3/+4} O _{3-δ}
	Calc. Ref ³⁴	Expt.	Calc. Ref ³⁴	Expt.	Expt. This Paper
A _g	582	-	555	-	
A _g	480	493	467	487	483
A _g	263	-	345	322	
A _g	162	198	299	278	273
A _g	81	140	242	243	238
A _g	326	284	200	184	215, 295*
A _g	246	257	154	160	155
B _{2g}	669	611	749	-	607*
B _{2g}	509	-	485	-	
B _{2g}	464	481	453	465	463
B _{2g}	369	308	366	-	371*
B _{2g}	150	170	292	-	
B _{2g}	123	109	232	258	255, 116*
B _{2g}	218	-	148	-	
B _{1g}	693	-	743	-	
B _{1g}	575	-	536	-	
B _{1g}	182	184	354	-	
B _{1g}	347	-	281	-	
B _{1g}	254	-	178	179	172
B _{3g}	692	-	754	-	718
B _{3g}	603	-	541	564	576
B _{3g}	462	-	459	-	
B _{3g}	343	320	304	320	314
B _{3g}	158	-	290	-	

Table III: Comparison of the reported in literature [calculated and experimentally recorded frequencies of the Raman – active modes of CaFeO_3 (CFO) and $\text{La}_{0.33}\text{Sr}_{0.67}\text{FeO}_3$ (LSFO)] with $\text{CaMn}_{1-x}\text{Fe}_x\text{O}_{3-\delta}$. Bold Frequencies in bold fonts indicate Raman lines with highest intensity.

CMO Ref ³⁴	CFO Ref ³⁸	LSFO Ref ³⁸	CaMn _{1-x} Fe _x O _{3-δ} (This Paper)			
			x =	0.1	0.2	0.3
-	-	-	115	107	116	-
-	149	-	-	-	-	-
160	-	-	163	-	-	-
179	-	-	-	-	-	-
184	-	-	-	-	-	-
-	197	-	-	-	211	-
-	218	-	226	233	239	-
-	-	251	-	247	-	-
243	-	-	-	-	-	-
258	-	-	-	-	-	-
278	-	-	277	-	-	279
-	305	307	-	-	-	-
320	-	-	315	313	-	-
322	-	-	-	-	-	-
-	-	380	-	-	-	-
465	-	-	444	-	-	-
487	-	-	470	476	474	473
			516	546	-	-
564	-	-	547	564	546	546
			643	-	-	-
-	707	704	715	708	709	706
			-	729	737	733