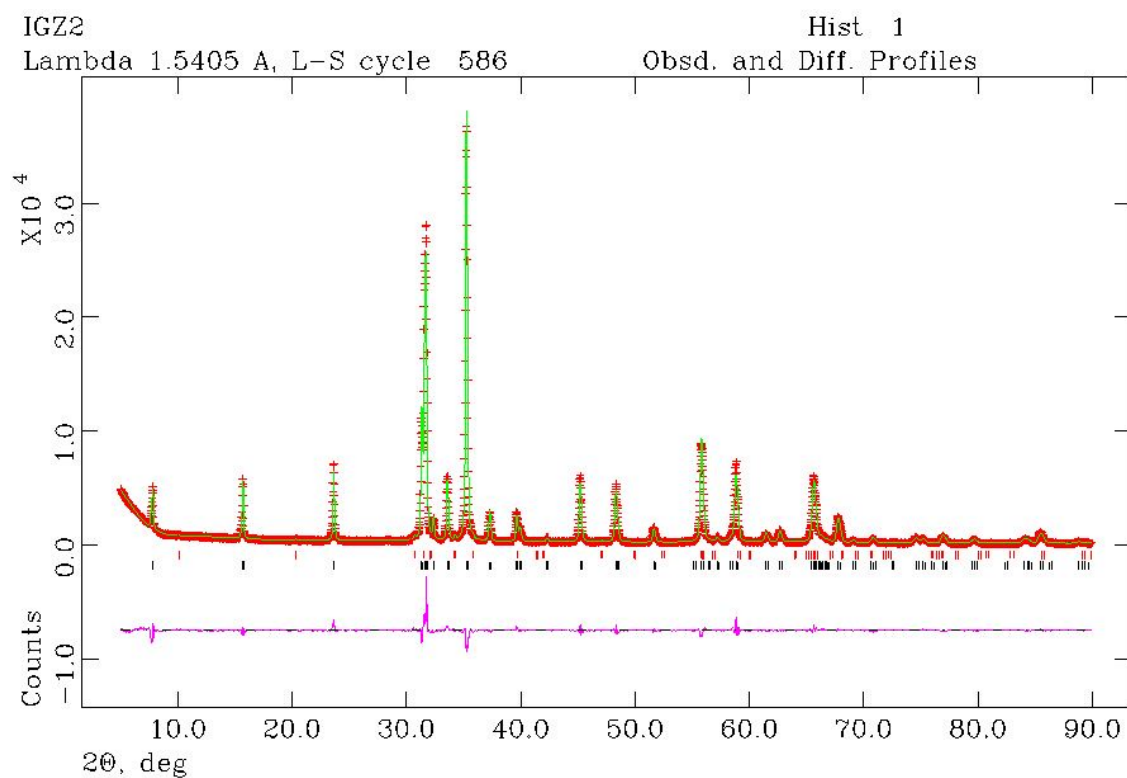
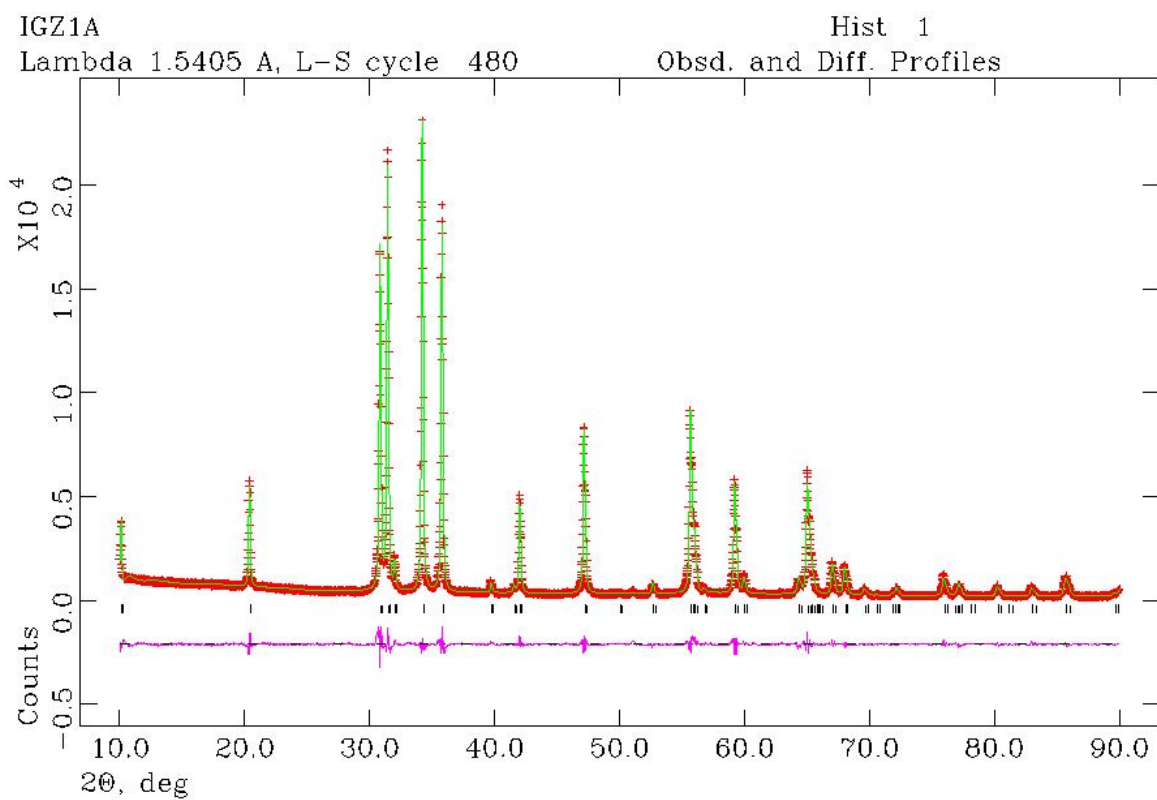


Investigations into variations in local cationic environment in layered oxide series $\text{InGaO}_3(\text{ZnO})_m$ ($m = 1-4$)

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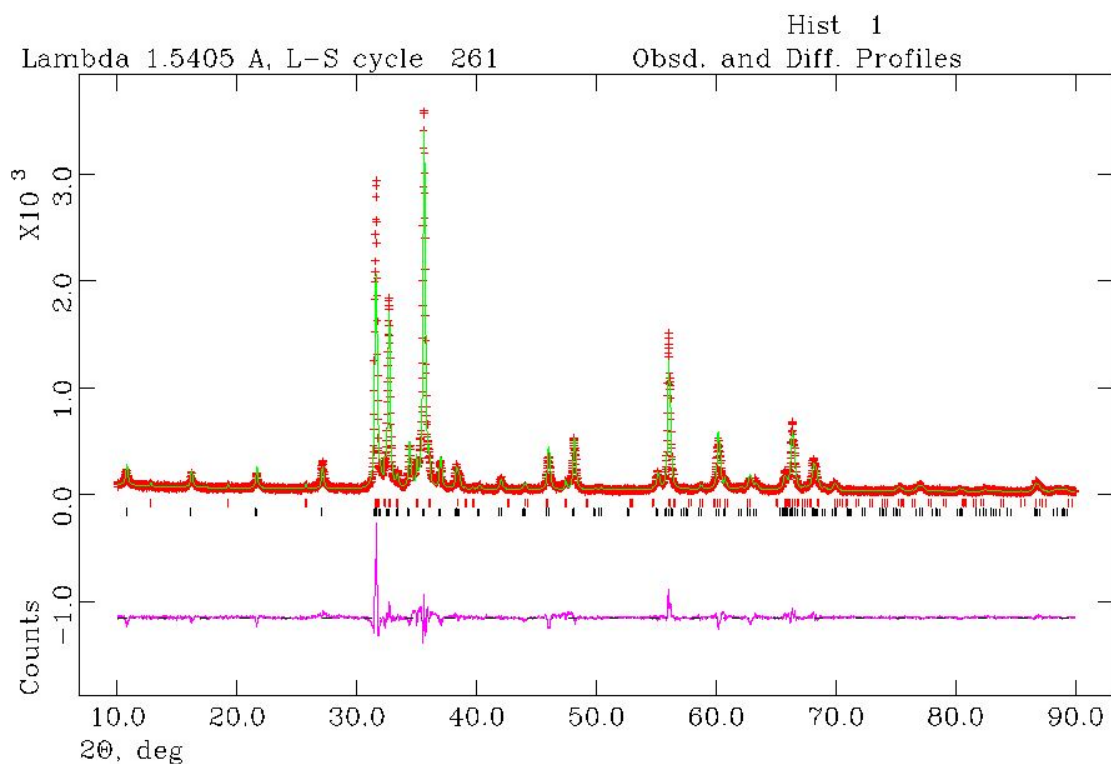
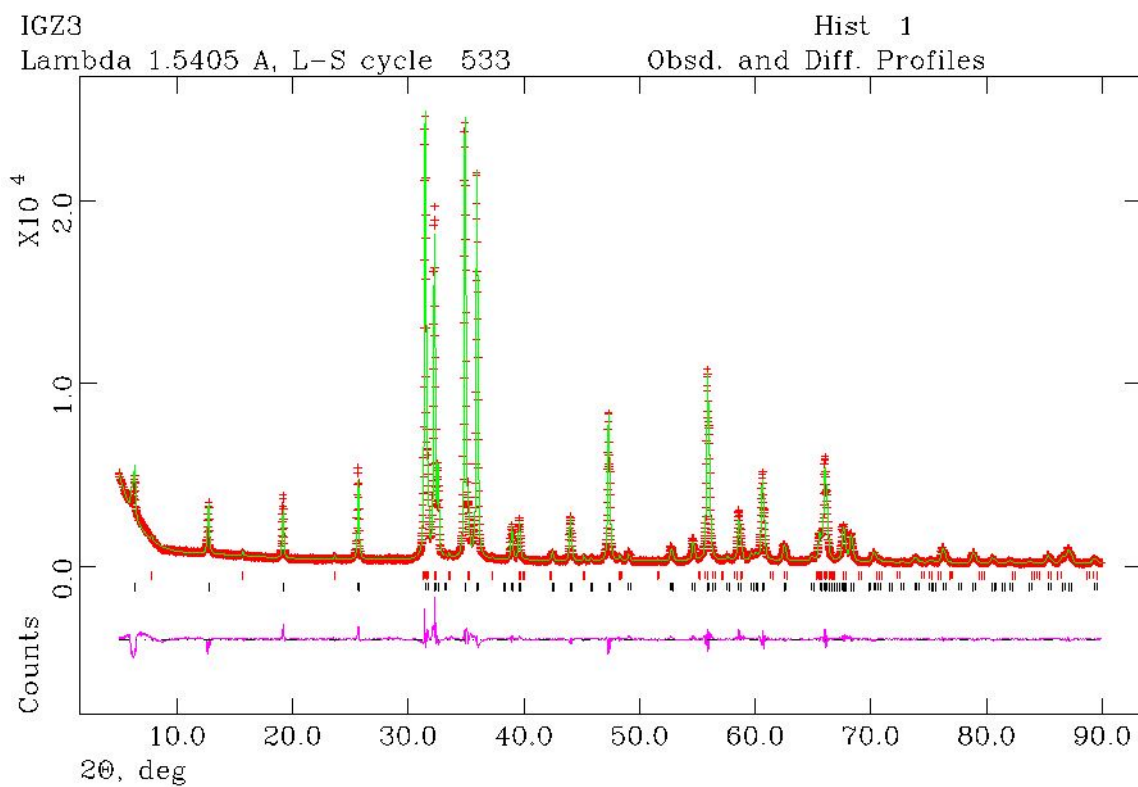


Figure S1. Rietveld refinement of the powder XRD pattern of $\text{InGaO}_3(\text{ZnO})_m$ ($m=1,2,3$ and 4) corresponding to IGZ1,2,3 and 4.

Table S2. The NMR fitting parameters for $\text{InGaO}_3(\text{ZnO})_m$ ($m=1,2,3$ and 4) corresponding to IGZ1,2,3 and 4.

	IGZ1					IGZ2				
	Td	Intermediate	TBP	Oct 1	Oct 2	Td	Intermediate	TBP	Oct 1	Oct 2
Model (DMFIT)	—	Q mas 1/2	CzSimple	CzSimple	CzSimple	Q mas 1/2	Q mas 1/2	CzSimple	CzSimple	CzSimple
pos(ppm)	—	176.86	128.52	75.94	35.94	214.58	171.56	139.00	69.00	29.35
Chemical Shift dist (ppm)	—	—	6.00	4.00	4.00	—	—	8.00	3.00	3.00
C_Q (KHz)	—	6950.12	6500.00	8025.36	8211.66	6084.53	6058.06	9000.00	8181.86	8314.07
%	—	11.56	67.89	15.97	4.58	26.41	13.83	49.41	5.90	4.45
	IGZ3					IGZ4				
	Td	Intermediate	TBP	Oct 1	Oct 2	Td	Intermediate	TBP	Oct 1	Oct 2
Model (DMFIT)	Q mas 1/2	Q mas 1/2	CzSimple	CzSimple	CzSimple	CzSimple	—	CzSimple	CzSimple	CzSimple
pos(ppm)	223.00	173.80	139.00	70.76	21.42	211.00	—	137.81	69.00	24.00
Chemical Shift dist (ppm)	—	—	1.00	3.00	3.00	5.00	—	2.00	1.00	2.00
C_Q (KHz)	6350.00	6599.58	8900.00	8653.14	8403.67	5120.06	—	8009.21	8983.16	8405.60
%	32.75	11.07	48.20	3.78	4.21	48.86	—	38.94	6.56	5.64

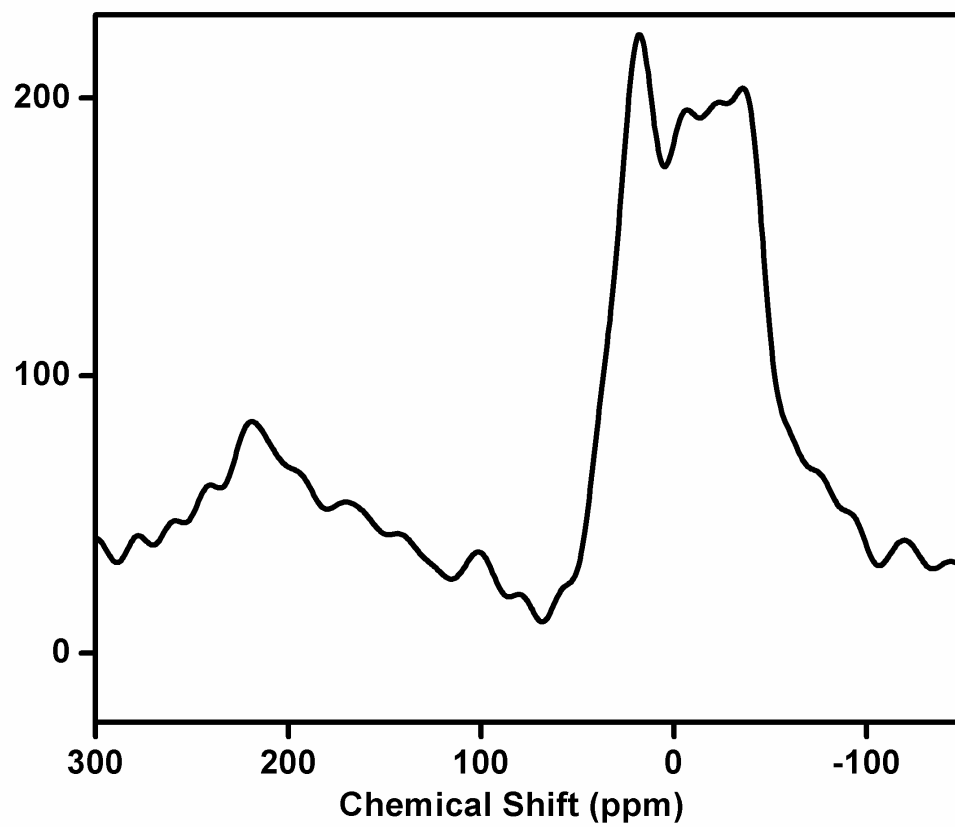


Figure S3. ^{71}Ga Solid state NMR of $\beta\text{-Ga}_2\text{O}_3$

Table S4. Local structural parameters for $\text{InGaO}_3(\text{ZnO})_m$ ($m=1,2,3$ and 4 named as IGZ1,2,3 and 4) evaluated by EXAFS measurements at Ga K-edge.

Paths	Parameters	IGZ1	IGZ2	IGZ3	IGZ4
Ga-O	R (Å)	1.86(±0.002)	1.85(±0.004)	1.84(±0.002)	1.85(±0.010)
	N	3.2(±0.012)	3.3(±0.03)	3.28(±0.015)	3.27(±0.058)
	σ^2	0.002(±0.003)	0.002(±0.001)	0.012(±0.004)	0.002(±0.001)
Ga-O	R (Å)	2.23(±0.006)	2.24(±0.029)	2.14(±0.009)	2.20(±0.020)
	N	1.85(±0.10)	0.94(±0.11)	0.8(±0.007)	1.42(±0.11)
	σ^2	0.002(±0.001)	0.002(±0.001)	0.002(±0.002)	0.002(±0.001)
Ga-Zn	R (Å)		3.01(±0.013)	3.02(±0.006)	3.18(±0.01)
	N		6(±0.167)	3(±0.068)	6(±0.11)
	σ^2		0.008(±0.002)	0.005(±0.001)	0.003(±0.002)
Ga-In	R (Å)	3.47(±0.015)			
	N	2.27(±0.116)			
	σ^2	0.009(±0.003)			

Table S5. Local structural parameters for $\text{InGaO}_3(\text{ZnO})_m$ ($m=1,2,3$ and 4 named as IGZ1,2,3 and 4) evaluated by EXAFS measurements at Zn K-edge.

Paths	Parameters	IGZ1	IGZ2	IGZ3	IGZ4
Zn-O	R (Å)	1.91(±0.003)	1.91(±0.003)	1.89(±0.005)	1.91(±0.007)
	N	3(±0.03)	3.78(±0.024)	2.85(±0.039)	3.0(±0.08)
	σ^2	0.006(±0.001)	0.006(±0.001)	0.006(±0.001)	0.007(±0.001)
Zn-O	R (Å)	2.34(±0.001)	2.38(±0.018)	2.24(±0.015)	2.21(±0.001)
	N	2(±0.09)	0.91(±0.15)	1.37(±0.17)	0.96(±0.11)
	σ^2	0.009(±0.002)	0.005(±0.003)	0.01(±0.003)	0.003(±0.001)
Zn-Ga	R (Å)	3.11(±0.006) (Zn-Zn/Ga)	3.18(±0.012)	3.07(±0.015)	3.09(±0.016)
	N	3.17(±0.011)	3(±0.16)	3(±0.13)	3(±0.15)
	σ^2	0.003(±0.001)	0.009(±0.002)	0.008(±0.001)	0.003(±0.002)
Zn-Zn	R (Å)	3.29(±0.005)	3.18(±0.008)	3.24(±0.007)	3.26(±0.016)
	N	6(±0.06)	4.48(±0.076)	6(±0.084)	6(±0.11)
	σ^2	0.006(±0.001)	0.009(±0.001)	0.009(±0.001)	0.006(±0.002)
Zn-In	R (Å)	3.44(±0.012)	3.52(±0.016)	3.65(±0.028)	4.11(±0.011)
	N	2.68(±0.11)	2.21(±0.016)	2.4(±0.028)	3(±0.011)
	σ^2	0.009(±0.002)	0.008(±0.003)	0.01(±0.009)	0.015(±0.002)

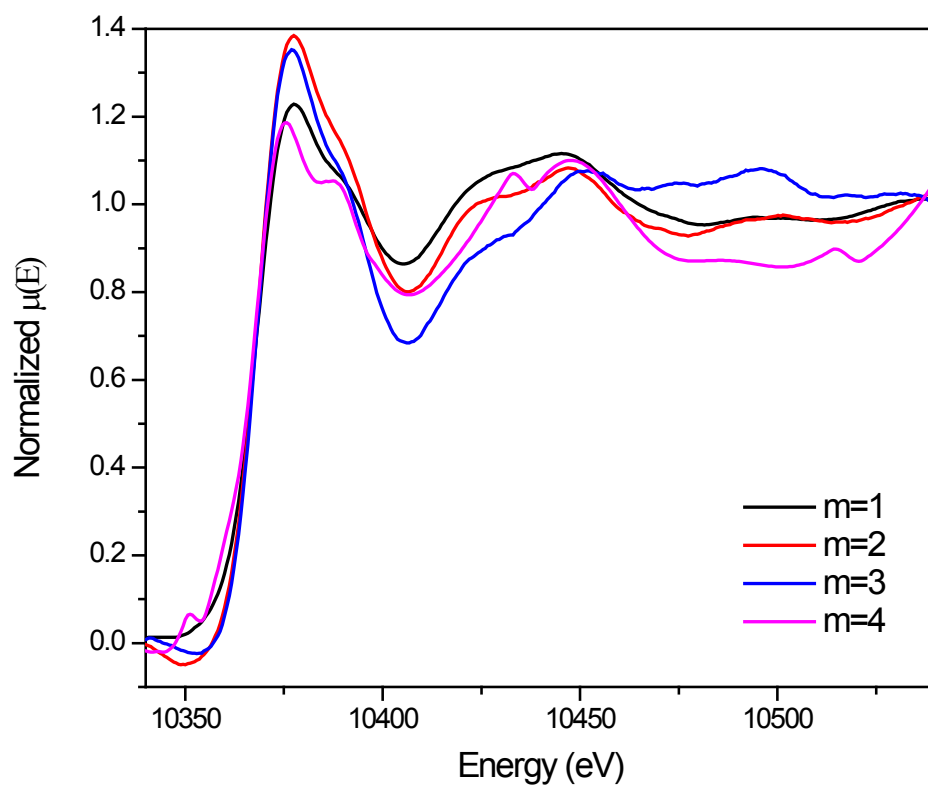


Figure S6. Normalised EXAFS spectra for $\text{InGaO}_3(\text{ZnO})_m$ for $m=1,2,3$ and 4 at Ga K-edge.

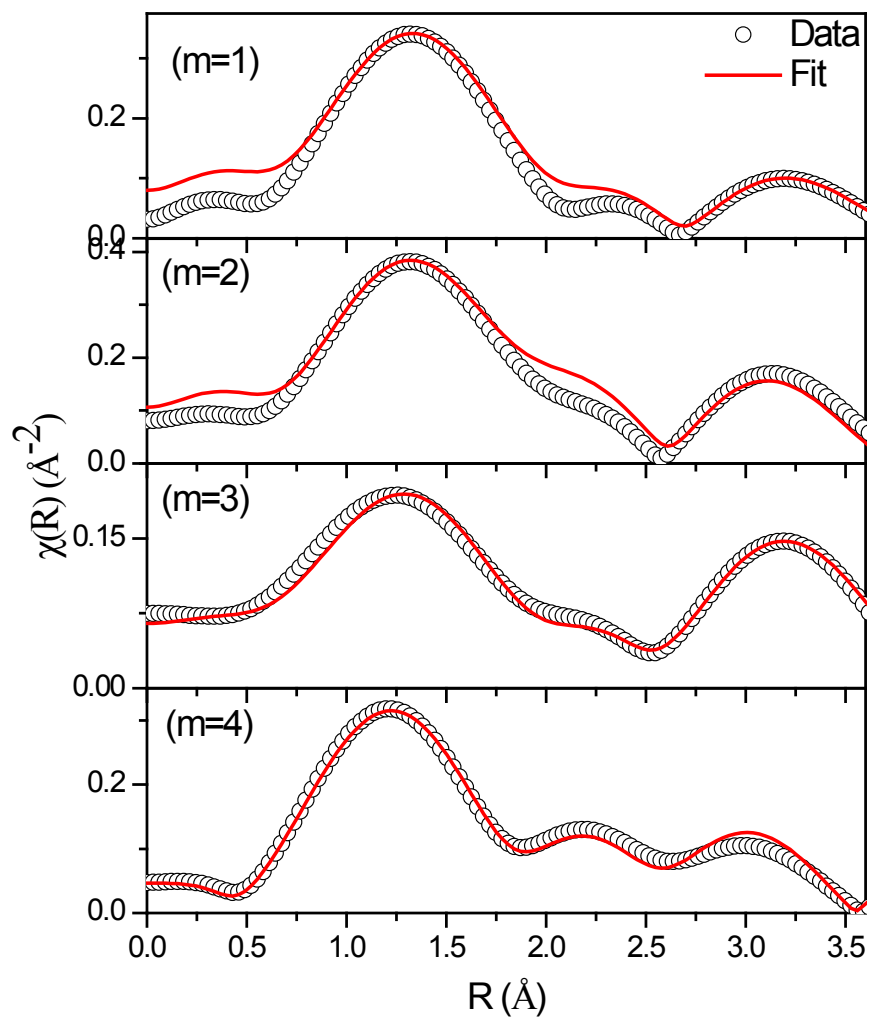


Figure S7. Fourier transformed EXAFS spectra of $\text{InGaO}_3(\text{ZnO})_m$ for $m=1,2,3$ and 4 at Ga K-edge (Scatter points) and theoretical fit (Solid line).