Supplementary Table 1. Coefficients of the second order polynomial equations (P_1, P_2, P_3) and (Q_1, Q_2, Q_3) used to fit the lattice parameter '*a*' and volume '*v*' against temperature T (K) for$(Th_{0.7-x}U_{0.3}Gd_x)O_{2+y}$ oxides in the temperature range 298–1273 K.

Sample	P_1	P_2 (10^{-5})	P_3(10^{-9})	Q_1	Q_2 (10^{-3})	Q_3(10^{-7})
TU	5.546	4.255	6.927	170.62	3.874	7.219
TUG1	5.525	4.445	5.864	165.65	4.144	5.261
TUG2	5.518	3.735	12.13	167.94	3.642	10.172
TUG3	5.506	5.099	1.603	166.93	4.510	2.809

Supplementary Table-2. Bond length, co-ordination number and disorder factor obtained from EXAFS fitting at Th L_3 edge

Paths	Parameters	TU	TUG1	TUG2	TUG3
Th-O	R (Å)	2.38	2.39	2.39	2.38
	N	8	7.07	8.33	6.4
	σ^2	0.0068	0.0050	0.0068	0.0026
Th-Th	R (Å)	3.91	3.89	3.90	3.88
	N	12	10.6	12.50	9.60
	σ^2	0.0063	0.0052	0.0063	0.0042
Th-O	R (Å)	4.55	4.52	4.53	4.49
	N	24	21.22	25.0	19.2
	σ^2	0.0058	0.0074	0.0060	0.0086

Supplementary Table-3. Bond length, co-ordination number and disorder factor obtained from EXAFS fitting at Gd L_3 edge

Paths	Parameters	TUG1	TUG2	TUG3
Gd-O	R (Å)	2.38	2.41	2.39
	N	7.75	8.25	8.0
	σ^2	0.0045	0.0065	0.0097
Gd-Th	R (Å)	3.86	3.73	3.89
	N	12.38	13.2	12.38
	σ^2	0.0047	0.0112	0.0055
Gd-O	R (Å)	4.49		4.52
	N	24.72		24.72
	σ^2	0.0049		0.0013