

Electronic Supporting Information

Cinnamate-Intercalated Layered Yttrium Hydroxide: UV Light-Responsive Switchable Material

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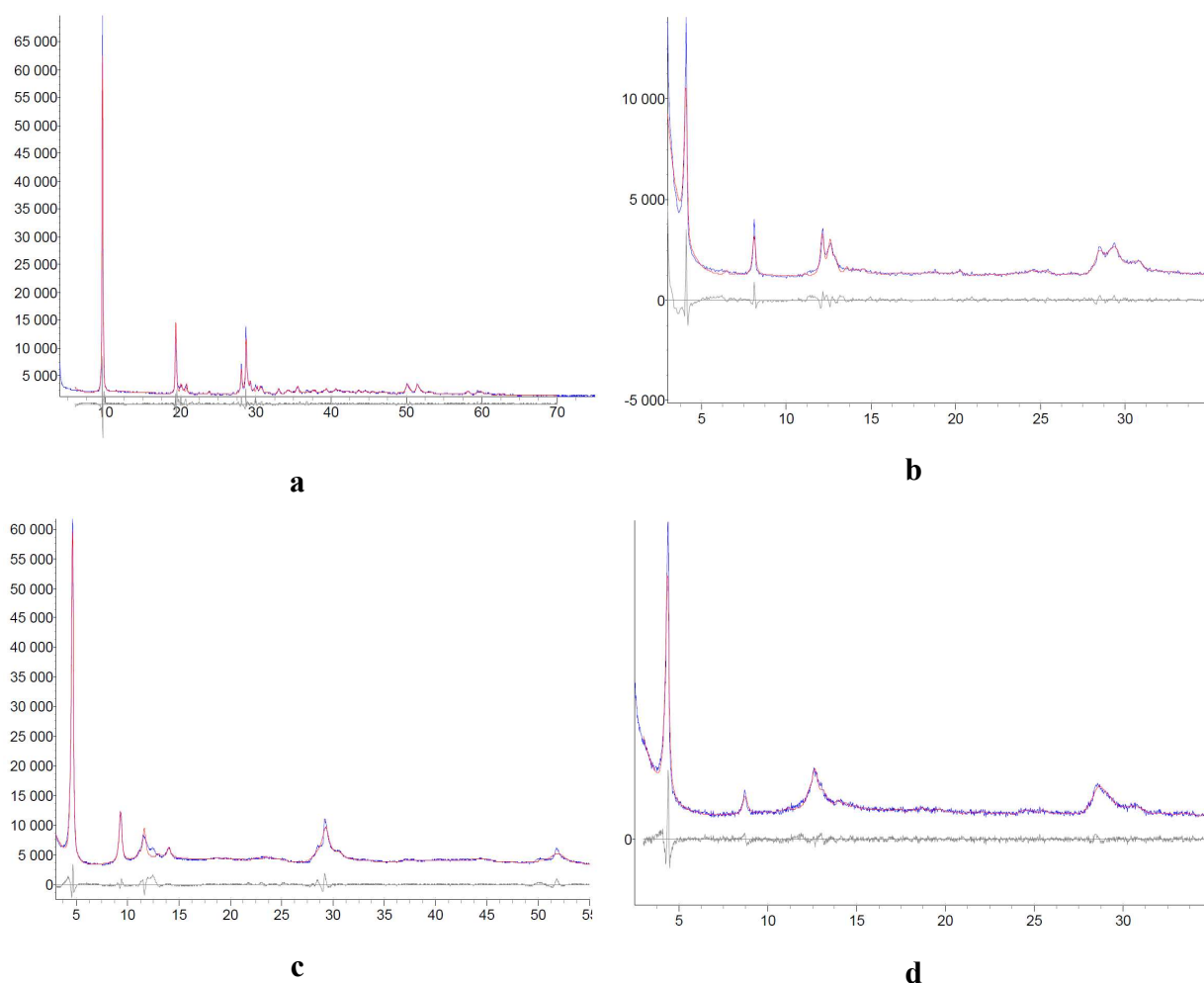


Figure S1. The full-profile refinement charts for the samples of (a) LYH-NO₃; (b) trans-cinnamate intercalated LYH (LYH-trans); (c) cis-cinnamate intercalated LYH (LYH-cis); (d) trans-cinnamate intercalated LYH after 52.5 h of UV-exposure of the suspension in isopropanol.

Table S1. The results of full-profile refinement for LYH-NO₃, trans-cinnamate (LYH-trans), and cis-cinnamate (LYH-cis) intercalated LYH sample (space group P2₁).

Sample	a, Å	b, Å	c, Å	β, °	Rwp
LYH-NO ₃	13.2290(13)	7.0100(20)	9.1620(16)	87.6550(93)	7.86
LYH-trans	13.955(28)	7.485(10)	21.712(12)	81.29(13)	8.12
LYH-cis	13.618(15)	6.972(11)	19.001(11)	87.084(50)	5.05
LYH-trans after 52.5 h of UV- exposure	14.474(21)	6.254(12)	20.640(31)	84.518(44)	6.77

Table S2. Position of the bands (cm^{-1}) in the Raman spectra of layered yttrium hydroxide (LYH) intercalated with cinnamate and assignment of the vibrations according to literature data [1]–[4].

Layered yttrium hydroxo- nitrate	LYH intercalated with trans- cinnamate at 120°C	LYH intercalated with cis- cinnamate at 120°C	LYH intercalated with trans- cinnamate at 160°C	Cinnamic acid [3]		Vibration
				monomer	dimer	
	621	621	620	621	618	ring deformation
719						$\delta(\text{NO}_3^-)$ [2]
	744				768	ring (aliphatic)
					808	C-COOH
	853	851	854	846		
	876	883	876	873		
	1002	1002	1002	1000	1000	ring
	1029	1031	1029	1026	1032	C-H in plane
1055						$\nu(\text{NO}_3^-)$, $\delta(\text{OH})$ [2]
	1158	1157	1158	1161	1156	C-H in plane; inorganic CO_3^{2-} [1]
					1169	C-H in plane
	1182	1180	1183	1179	1187	C-H in plane [3]
	1203	1203	1204	1210	1207	/
					1215	cinnamate [1] /
	1253	1253	1253	1258		C-O in plane [4]
					1289	C-H saturated
					1360	
1406			1395			
	1434		1435			O-H in plane [4]
	1456	1451	1457	1450		C-H unsaturated; inorganic CO_3^{2-} [1]
	1497	1495	1497	1494		C-H unsaturated
					1586	C=C (aromatic)
	1603	1600	1603	1599	1599	
	1644	1642	1644	1637		C=C (isolated) [1] C=C (aliphatic) [3]
					2915	C-H saturated
					2942	
					2964	
					2986	
	3060	3060	3060		3058	O-H[1]; C-H unsaturated [3]

Table S3. Position of the bands (cm^{-1}) in the infrared spectra of layered yttrium hydroxide (LYH) intercalated with cinnamate and assignment of the vibrations according to literature data [5].

Trans-cinnamic acid	LYH intercalated with trans-cinnamate	LYH intercalated with cis-cinnamate	Mg ₂ Al-LDH intercalated with trans-cinnamate [5]	Mg ₂ Al-LDH intercalated with cis-cinnamate [5]	Vibration [5]
1667					
1626	1641	1636	1637	1637	n(C=C)cinn
1599					
1576	1578	1577	1576		n(CC)ar + b(CH) + a(CCC)
		1555		1550	n _{as} (COO ⁻)
	1545		1537		
1494	1495	1497	1499	1493	b(CH) + n(CC)ar
1447	1452	1448			b(CH) + n(CC)ar
		1437			
1416	1423	1420			O-H
	1398	1399	1394		n _s (COO ⁻)
		1356		1363	
1333, 1311					
1283	1292	1292	1290		b(CH)cinn + n(CC)
	1250	1249	1248		b(CH)cinn
1219				1211	
1205	1203	1203			
1175				1184	b(CH)ar + n(CC)ar
1158		1149			
1098	1070	1072	1070	1076	b(CH)ar + n(CC)ar
	1047	1045			
1027	1028	1028		1032	b(CH)ar + n(CC)ar
1000				1007	a(CCC) + n(CCC)
976	974	978	978	968	g(CCH)cinn
942				941	
909		917			
878	876	878	880	882	g(CH)ar
844	850	848	850	856	b _s (COO ⁻) + b(CH)cinn
765	771	775	777	764	g(CH)ar + g(HCCO) + g(OCOC)
	737				
707	715	719	717		F(CCC) + g(CH)ar

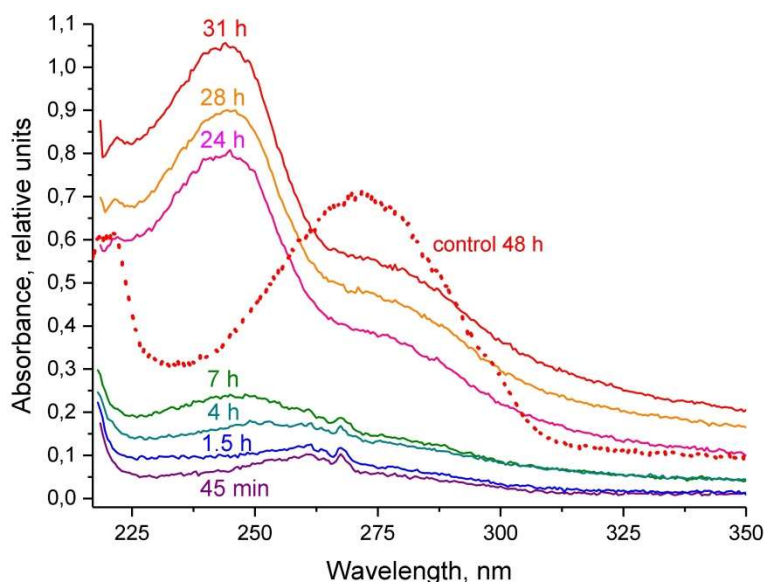


Figure S2. Absorption spectra of aliquots sampled at different time intervals during UV-irradiation of trans-cinnamate intercalated LYH suspension in isopropanol.

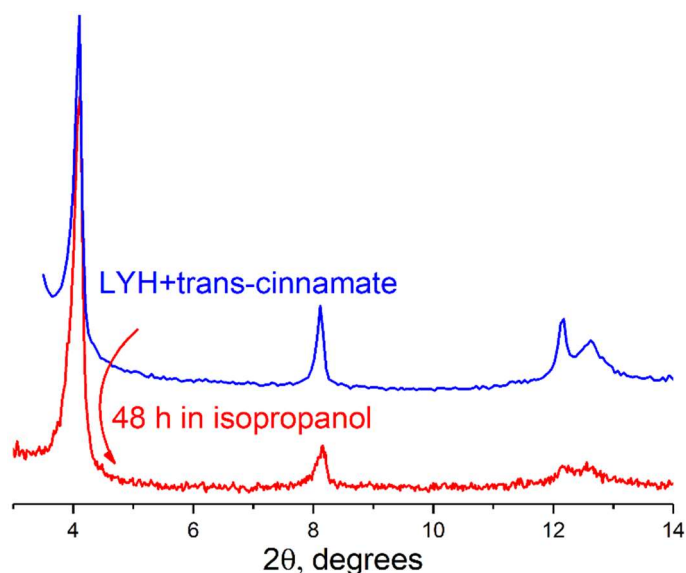


Figure S3. Diffraction patterns of the initial trans-cinnamate intercalated LYH and the product of its soaking in isopropanol for 48 h.

References

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