

Supramolecular dendrimers: Unusual mesophases of ionic liquid crystals derived from protonation of DAB dendrimers with facial amphiphilic carboxylic acids†

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Electronic Supporting Information

Table S1. X-ray data from Guinier powder patterns (θ_{obs} : experimental scattering angle; d_{obs} : experimental and d_{calc} : calculated d spacing; hk : assigned indices. in case of 3D-Hex phases hl or lh (see text) Parameter used: Lattice parameters or d values used to calculate d_{calc}).

Compound/ mixture	T (°C)	Phase Plane group	θ_{obs} (°)	d_{obs} (nm)	hk	d_{calc} (nm)	$d_{\text{obs}} - d_{\text{calc}}$ (nm)	Parameter used (nm)
A0/G3 16:1	130	SmA	1.45	3.04				
A4	55	SmA	1.25	3.53				
A3/G1 4:1	80	Col _{hex}	0.91	4.84	10	4.93	-0.01	$a = 5.7$
		$p6mm$	1.54	2.87	11	2.85	0.02	
			1.77	2.49	20	2.46	0.03	
A3/G2 8:1	105	Col _{squ}	1.15	3.84	10	3.83	0.01	$a = 3.8$
		$p4mm$	1.64	2.70	11	2.71	-0.01	
A3/G2 8:1	100	Col _{squ}	0.98	4.53	20	4.55	-0.02	$a = 9.1$
		$p4gm$	1.09	4.06	21	4.07	-0.01	
			1.38	3.21	22	3.21	-0.00	
			2.05	2.15	33	2.14	0.01	

Table S1 continued

Compound/ mixture	T (°C)	Phase Plane group	θ_{obs} (°)	d_{obs} (nm)	hk	d_{calc} (nm)	$d_{\text{obs}} - d_{\text{calc}}$ (nm)	Parameter used (nm)
A3/G3 16:1	108	Col _{squ}	1.18	3.75	10	3.80	-0.05	$a = 3.8$
		<i>p4mm</i>	1.62	2.73	11	2.69	0.04	
A3/G3 16:1	80	Col _{squ}	0.98	4.53	20	4.55	-0.02	$a = 9.1$
		<i>p4gm</i>	1.10	4.02	21	4.07	-0.05	
			1.38	3.21	22	3.22	-0.01	
			1.52	2.90	31	2.88	0.02	
			1.74	2.54	32	2.52	0.02	
			1.99	2.22	41	2.21	0.01	
			2.16	2.04	42	2.04	0.00	
A3/G2 2:1	95	Col _{squ}	0.99	4.45	10	4.50	-0.05	$a = 4.5$
		<i>p4mm</i>	1.38	3.19	11	3.18	0.01	
			1.98	2.24	20	2.25	-0.01	
A3/G2 4:1	91	Col _{squ}	1.10	4.03	10	4.06	-0.03	$a = 4.1$
		<i>p4mm</i>	1.53	2.89	11	2.87	0.02	
			2.17	2.04	20	2.03	0.01	
A3/G2 4:1	55	Col _{squ}	0.96	4.58	20	4.59	-0.01	$a = 9.2$
		<i>p4gm</i>	1.08	4.11	21	4.11	-0.00	
			1.72	2.57	32	2.55	0.02	
			1.98	2.23	41	2.23	-0.00	
A3/G2 10:1	100	3D-Hex ^a	1.15	3.83	01	3.84	-0.01	$d_1 = 3.8$
			1.25	3.53	10	3.53	-0.00	$d_2 = 3.5$
			1.70	2.59	11	2.60	-0.01	
			2.29	1.93	02	1.92	0.01	

^a Hexagonal channelled layer phase ChL_{hex}

Table S1 continued

Compound/ mixture	T (°C)	Phase Plane group	θ_{obs} (°)	d_{obs} (nm)	hk	d_{calc} (nm)	$d_{\text{obs}} - d_{\text{calc}}$ (nm)	Parameter used (nm)
A3/G2 14:1	110	3D-Hex ^a	1.15	3.84	01	3.84	0.00	$d_1 = 3.8$
			1.25	3.54	10	3.54	0.00	$d_2 = 3.5$
			1.70	2.60	11	2.60	0.00	
A4/G1 4:1	85	Col _{squ} <i>p4mm</i>	1.09	4.06	10	4.08	-0.02	$a = 4.1$
			1.52	2.90	11	2.89	0.01	
			2.16	2.04	20	2.04	0.00	
A4/G1 4:1	65	Col _{squ} <i>p4gm</i>	0.94	4.71	20	4.72	-0.01	$a = 9.4$
			1.05	4.21	21	4.22	-0.01	
			1.32	3.34	22	3.34	-0.00	
			1.48	2.99	31	2.98	0.01	
			1.67	2.64	32	2.62	0.02	
			1.93	2.29	41	2.29	0.00	
			2.11	2.09	42	2.11	-0.02	
A4/G3 16:1	80	Col _{squ} <i>p4mm</i>	1.08	4.09	10	4.20	-0.11	$a = 4.2$
			1.49	2.97	11	2.97	0.00	
			2.09	2.11	20	2.10	0.01	
A4/G5 64:1	80	Col _{squ} <i>p4mm</i>	1.01	4.38	10	4.40	-0.02	$a = 4.4$
			1.42	3.11	11	3.11	-0.00	
			1.97	2.24	20	2.20	0.04	

^a Hexagonal channelled layer phase ChL_{hex}

Table S2. X-ray data of the system **A3/G4** (32:1) obtained from Guinier powder patterns.

T (°C)	θ_{obs} (°)	d_{obs} (nm)	h	k	θ_{calc} (°)	$\theta_{\text{obs}}-\theta_{\text{calc}}$	plane group	a_{squ} (nm)		
110	1.131	3.906	1	0	1.126	0.005	<i>p4mm</i>	3.92		
	1.589	2.780	1	1	1.593	-0.004				
100	1.152	3.834	1	0	1.129	0.023	<i>p4mm</i>	3.91		
	1.596	2.768	1	1	1.597	-0.001				
90	0.959	4.606	2	0	0.959	0.000	<i>p4gm</i>	9.21		
	1.075	4.1095	2	1	1.071	0.004				
	1.350	3.272	2	2	1.356	-0.006				
	1.726	2.559	3	2	1.729	-0.003				
	1.974	2.238	4	1	1.977	-0.003				
	1.138	3.882	1	0	1.124	0.014			<i>p4mm</i>	3.93
	1.587	2.784	1	1	1.589	-0.002				
80	0.952	4.640	2	0	0.959	-0.007	<i>p4gm</i>	9.21		
	1.075	4.109	2	1	1.072	0.003				
	1.353	3.265	2	2	1.356	-0.003				
	1.741	2.538	3	2	1.729	0.012				
	1.973	2.239	4	1	1.977	-0.004				
	1.125	3.926	1	0	1.123	0.002			<i>p4mm</i>	3.93
	1.586	2.785	1	1	1.589	-0.003				
70	0.950	4.650	2	0	0.955	-0.005	<i>p4gm</i>	9.25		
	1.063	4.155	2	1	1.067	-0.004				
	1.351	3.270	2	2	1.350	0.001				
	1.725	2.561	3	2	1.721	0.004				
	1.970	2.243	4	1	1.968	0.002				
	1.087	4.064	1	0	1.104	-0.017			<i>p4mm</i>	4.00
	1.579	2.798	1	1	1.561	0.018				
25	0.926	4.770	2	0	0.932	-0.006	<i>p4gm</i>	9.47		
	1.039	4.253	2	1	1.042	-0.003				
	1.314	3.362	2	2	1.319	-0.005				
	1.677	2.635	3	2	1.681	-0.004				
	1.877	2.354	4	0	1.865	0.012				
	1.927	2.293	4	1	1.922	0.005				

Table S3. X-ray data of the system **A3/G5** (64:1) obtained from Guinier powder patterns.

T (°C)	θ_{obs} (°)	d_{obs} (Å)	h	k	θ_{calc} (°)	$\theta_{\text{obs}} - \theta_{\text{calc}}$	Plane group	a_{squ} (Å)		
100	1.112	3.971	1	0	1.115	-0.003	<i>p4mm</i>	3.96		
	1.575	2.805	1	1	1.577	-0.002				
90	0.955	4.625	2	0	0.955	0.000	<i>p4gm</i>	9.25		
	1.050	4.207	2	1	1.067	-0.017				
	1.975	2.237	4	1	1.968	0.007				
	1.100	4.016	1	0	1.098	0.002			<i>p4mm</i>	4.02
1.555	2.841	1	1	1.553	0.002					
80	0.962	4.589	2	0	0.955	0.007	<i>p4gm</i>	9.25		
	1.050	4.207	2	1	1.067	-0.017				
	1.712	2.580	3	2	1.721	-0.009				
	1.975	2.237	4	1	1.968	0.007				
	1.100	4.016	1	0	1.098	0.002			<i>p4mm</i>	4.02
	1.555	2.841	1	1	1.553	0.002				
70	0.945	4.674	2	0	0.939	0.006	<i>p4gm</i>	9.40		
	1.038	4.258	2	1	1.050	-0.012				
	1.675	2.637	3	2	1.694	-0.019				
	1.950	2.266	4	1	1.937	0.013				
	1.100	4.016	1	0	1.098	0.002			<i>p4mm</i>	4.02
	1.549	2.852	1	1	1.553	-0.004				
60	0.925	4.775	2	0	0.929	-0.004	<i>p4gm</i>	9.50		
	1.038	4.258	2	1	1.039	-0.001				
	1.688	2.618	3	2	1.676	0.012				
	1.912	2.310	4	1	1.916	-0.004				
	1.088	4.062	1	0	1.093	-0.005			<i>p4mm</i>	4.04
	1.549	2.852	1	1	1.546	0.003				
50	0.912	4.841	2	0	0.920	-0.008	<i>p4gm</i>	9.60		
	1.025	4.309	2	1	1.028	-0.003				
	1.662	2.657	3	2	1.658	0.004				
	1.912	2.310	4	1	1.896	0.016				
	1.088	4.062	1	0	1.087	0.001			<i>p4mm</i>	4.06
	1.538	2.873	1	1	1.538	0.000				
40	0.912	4.841	2	0	0.920	-0.008	<i>p4gm</i>	9.60		
	1.038	4.258	2	1	1.028	0.010				
	1.912	2.310	4	1	1.896	0.016				
	1.075	4.109	1	0	1.077	-0.002			<i>p4mm</i>	4.10
	1.548	2.854	1	1	1.523	0.025				