Supporting Information

Detailed description of monomer MDATL synthesis

N-[4-(10-Bromodecyloxy)phenyl]acetamide (2). A mixture of 4-acetamidophenol (9.20 g, 0.06 mol), 1,10-dibromodecane (30.0 g, 0.10 mol) and potassium hydroxide (3.60 g, 0.06 mol) in a mixture of dioxane (100 ml) and water (40 ml) was heated under reflux for 6 h. After cooling to room temperature, the solution was poured into water (1 l). Precipitated *N*-(4-(10-bromodecyloxy)phenyl)acetamide was filtered off, washed with water and recrystallized from toluene. Yield 20.06 g (0.05 mol, 89 %) as a white solid. M.p. 123-125 °C. ^{1}H NMR ($CDCl_3$) δ 7.35 (d, *J*=8.8 Hz, 2H, H-2, H-6); 6.83 (d, *J*=8.8 Hz, 2H, H-3, H-5); 3.90 (t, 2H, CH_2O); 3.41 (t, *J*=6.6 Hz, 2 H, CH_2Br), 1.75 - 1.85 (q, 2 H, C**H**$_2$$CH_2O$), 1.61 - 1.71 (q, 2 H, C**H**$_2$$CH_2Br$), 1.53 - 1.14 (m, 12 H, $(CH_2)_6$).

4-(10-Bromodecyloxy)benzenamium hydrogensulphate (3).

*A*cetamide **2** (22.50 g, 0.05 mol) was suspended in sulphuric acid (150 ml, 40%) and refluxed, until the solid was completely dissolved. After cooling to room temperature, the precipitate was filtered off, washed with water and recrystallized from ethanol to yield white solid **3** (21.94 g, 0.05 mol, 95 %). ^{1}H NMR (DMSO-d_6) δ 7.28 (d, 2 H, *J*=9.1 Hz, H-2, H-6), 7.03 (d, 2 H, *J*=9.1 Hz, H-3, H-5), 3.97 (t, 2 H, *J*=6.3 Hz, CH_2O), 3.54 (t, 2 H, *J*=6.7 Hz, CH_2Br), 1.83 (q, 2 H, C**H**$_2$$CH_2O$), 1.72 (q, 2H, C**H**$_2$$CH_2Br$), 1.43 (m, 12 H $(CH_2)_6$).

4-[[4-(10-Bromodecyloxy)phenyl]diazenyl]-3,5-dimethylphenol (4)

A solution of sodium nitrite (5.0 g, 0.07 mol) in 5 ml of water) was added dropwise to a suspension of hydrogensulphate **3** (21.94 g, 0.05 mol) in glacial acetic acid (100 ml), keeping the temperature below 5 ºC. Diazotization mixture was stirred for further 30 min and then solid urea was added to destroy the excess of nitrous acid. The resulting solution was added portionwise to the mixture of 3,5-dimethylphenol (6.20 g, 0.05 mol) and sodium hydroxide (72.0 g, 1.80 mol) in water (100 ml). The temperature of the reaction was kept below 10 °C by ice water bath. After the addition of the last portion of diazonium salt solution, the reaction mixture was stirred for 3 hours. A red solid precipitated, which was filtered off and washed with HCl (100 ml, 1 : 5) and with water. Crude product was purified by boiling in ethanol with subsequent cooling to 0 °C and filtration of the precipitated product. The same

procedure was repeated with heptane to yield **4** as a red amorphous solid (20.70 g, 0.04 mmol, 87 %). M.p. 47 - 49 °C. ^{1}H NMR (300 MHz, $CDCl_3$) δ ppm 7.82 (d, *J*=8.8 Hz, 2 H, ArH – *ortho* to azo), 6.98 (d, *J*=8.8 Hz, 2 H, ArH – *ortho* to OCH_2), 6.59 (s, 2 H, ArH - *ortho* to OH), 4.02 (t, *J*=6.6 Hz, 2 H, CH_2O), 3.41 (t, *J*=6.6 Hz, 2 H, CH_2Br), 2.39 (s, 6 H, $ArCH_3$), 1.75 - 1.85 (q, 2 H, C**H**$_2$$CH_2O$), 1.61 - 1.71 (q, 2 H, C**H**$_2$$CH_2Br$), 1.53 - 1.14 (m, 12 H, $(CH_2)_6$).

10-[4-[(4-Hydroxy-2,6-dimethylphenyl)diazenyl]phenoxy]decyl methacrylate (5)

Phenol **4** (17.0 g, 36.84 mmol) was added to a stirred mixture of potassium methacrylate (11.40 g, 92.10 mmol) and potassium iodide (1.60 g, 0.01 mol) in DMSO (150 ml) at 50 °C. The mixture was allowed to cool to room temperature and stirred for 3 days. Resulting mixture was poured into water (700 ml), decanted and after neutralization of the residue by conc. acetic acid, the red oil was dissolved in chloroform (200 ml) and washed with water (3 x 500 ml). Organic layer was dried with anhydrous sodium sulphate. Evaporation of the solvent yielded crude **5**, which was further purified by the column chromatography on silica gel using dichloromethane – acetone (96 : 4) mixture as eluent. Yield 12.0 g (25.71 mmol, 70 %), red solid, m.p. 31 – 35 °C ^{1}H NMR (300 MHz, $CDCl_3$) δ ppm 7.82 (d, *J*=8.8 Hz, 2 H, ArH – *ortho* to azo), 6.98 (d, *J*=8.8 Hz, 2 H, ArH – *ortho* to OCH_2), 6.59 (s, 2 H, ArH - *ortho* to OH), 6.10 (bs, 1 H, *trans-H* C**H**$_2$=), 5.55 (bs, 1 H, *cis-H* C**H**$_2$=), 4.13 (t, *J*=7.3 Hz, 2 H, $COOCH_2$), 4.02 (t, *J*=6.6 Hz, 2 H, CH_2O), 2.39 (s, 6 H, $ArCH_3$), 1.94 (s, 3 H, C**H**$_3$CH), 1.75 - 1.85 (q, 2 H, C**H**$_2$$CH_2OOC$), 1.61 - 1.71 (q, 2 H, C**H**$_2$$CH_2O$), 1.14 - 1.53 (m, 12 H, 6xCH_2).

(S)-1-(Hexyloxy)-1-oxopropan-2-yl 4-formylbenzoate (7)

A mixture of 4-formylbenzoic acid (15.80 g, 0.10 mol) and (*S*)-hexyl lactate (17.40 g, 0.10 mol) was dissolved in a mixture of dichloromethane and THF (200 + 200 ml). Dicyclohexylcarbodiimide (21.70 ml, 0.11 mol) and 4-(*N,N*-dimethylamino)pyridine (1.30 g, 0.01 mol) was added and the mixture was stirred for 24 h at room temperature. Precipitated dicyclohexylurea was filtered off and the filtrate washed with HCl (150 ml, 1 : 15) and water.

Organic layer was dried with anhydrous sodium sulphate. Removal of the solvent under reduced pressure yielded benzoate **7** as a colourless viscous liquid (28.80 g, 0.09 mol, 94 %). Thus obtained product was used in the next step without further purification. ^{1}H NMR (300 MHz, $CDCl_3$) δ ppm 10.11 (s, 1H, CHO) 8.25 (d, 2 H,

J=8.8 Hz, *ortho* to CHO), 7.97 (d, 2H, *J*=8.8 Hz, *ortho* to COO), 5.37 (q, *J*=7.1 Hz, 1 H, CH*), 4.11 - 4.24 (m, 2 H, COOC**H**$_2$), 1.57 - 1.71 (m, 5 H, C**H**$_3$CH*, COOCH$_2$C**H**$_2$), 1.16 - 1.42 (m, 6 H, (CH$_2$)$_3$), 0.88 (t, 3 H, *J*=6.7 Hz, CH$_2$C**H**$_3$).

(S)-4-[[[1-(hexyloxy)-1-oxopropan-2-yl]oxy]carbonyl]benzoic acid (8)

The solution of potassium permanganate (14.5 g, 0.09 mol) in water (100 ml) at ca 50 °C was added in 8 portions every 15 min to the agitated solution of 4-formylbenzoate **7** (28.80 g, 0.09 mol) in pyridine, cooled to - 10°C by the ice-salt bath. After the addition of the last portion, the mixture was allowed to stand overnight at - 20°C and then it was slowly added to the mixture of conc. HCl (150 ml) in the ice-cold water (500 ml). Resulting suspension was neutralized by the additional amount of concentrated HCl (50 ml) and filtered by suction through a pad of celite. Filtered solid was boiled with acetone (200 ml) and filtered again. Filtrate was dried with anhydrous sodium sulphate. Evaporation of the acetone yielded crude **7** which was recrystallized from heptane. Yield 26.40 g (0.08 mol, 91 %), white solid, m.p. 69 – 70°C. ^{1}H NMR (300 MHz, CDCl$_3$) δ ppm 8.19 (s, 4 H, Ar-H), 5.36 (q, *J*=7.1 Hz, 1 H, CH*), 4.12 - 4.24 (m, 2 H, COOC**H**$_2$), 1.57 - 1.71 (m, 5 H, C**H**$_3$CH*, COOCH$_2$C**H**$_2$), 1.16 - 1.42 (m, 6 H, (CH$_2$)$_3$), 0.88 (t, 3 H, *J*=6.7 Hz, CH$_2$C**H**$_3$).

MDATL [(S)-1-(hexyloxy)-1-oxopropan-2-yl [4-[[4-[[10-(methacryloyloxy)decyl]-oxy]phenyl]diazenyl]-3,5-dimethylphenyl] terephthalate] Phenol **5** (1.40 g, 3.0 mmol) and benzoic acid **8** (1.0 g, 3.2 mmol) were dissolved in dry dichloromethane and dicyclohexylcarbodiimide (0.61 g, 3.0 mmol) and 4-(*N,N*-dimethylamino)pyridine (0.04 g, 0.3 mmol) were added. The mixture was stirred for 24 h and then the precipitated dicyclohexylurea was filtered off. The solvent was removed under reduced pressure and the crude product purified by column chromatography on silica gel (dichloromethane-acetone, 98 : 2). Recrystallization from hexane at -20 °C yielded 1.74 g (2.19 mmol, 73 %) of **MDATL**. ^{1}H NMR (300 MHz, CDCl$_3$) δ ppm 8.17 - 8.33 (m, 4 H, Ar-H), 7.89 (d, *J*=8.8 Hz, 2 H, Ar-H), 6.94 - 7.08 (m, 4 H, Ar-H), 6.10 (s, 1 H, *trans*-C**H**$_2$=), 5.56 (s, 1 H, *cis*-C**H**$_2$=), 5.37 (q, 1 H, *J*=7.0 Hz, CH*), 4.13 (t, *J*=7.3 Hz, 2 H, COOCH$_2$), 4.02 (t, *J*=6.6 Hz, 2 H, CH$_2$O), 2.38 (s, 6 H, ArCH$_3$), 1.95 (s, 3 H, C**H**$_3$CH), 1.75 - 1.85 (q, 2 H, C**H**$_2$CH$_2$OOC), 1.61 - 1.71 (q, 2 H, C**H**$_2$CH$_2$O), 1.14 - 1.53 (m, 12 H, 6xCH$_2$), 0.88 (t, 3 H, *J*=6.7 Hz, CH$_2$C**H**$_3$).

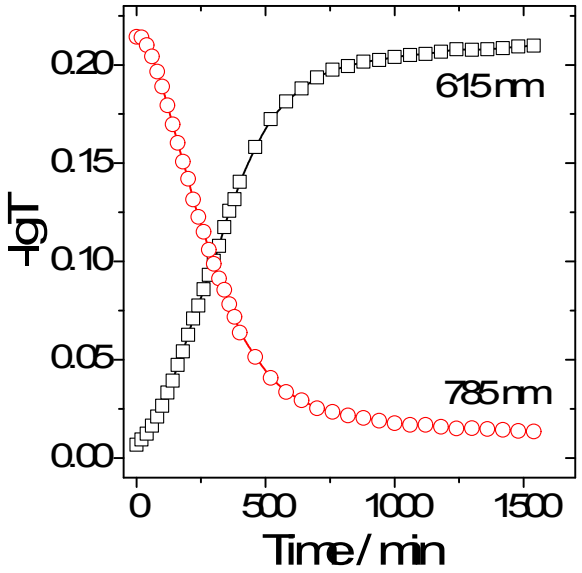

Fig. S1 Kinetics of absorbance changes at wavelengths corresponding to the peaks shown in Fig. 4a.

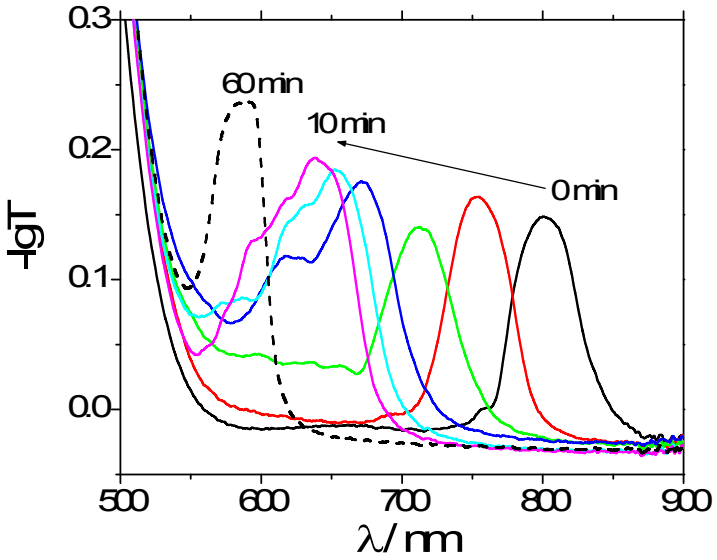

Fig. S2 Shift of selective light reflection peak during visible light irradiation (436 nm, ~2 mW/cm^2) of planarly oriented cell of **polymer-stabilized mixture**. Spectra were recorded each 120 s of irradiation. Dashed line shows selective light reflection peak after 60 min of irradiation. Prior to visible light irradiation cell was irradiated by UV light during 20 min (steady state).