

Supporting Information

The Important Role of the Location of Alkoxy Group on the Thiophene Ring in Designing Efficient Organic Nonlinear Optical Materials Based on Double-Donor Chromophores

Yuhui Yang ^{ab}, Jialei Liu ^a, Maolin Zhang ^{ab}, Fenggang Liu ^{ab}, Haoran Wang ^{ab}, Shuhui Bo ^{*a},
Zhen Zhen ^a, Ling Qiu ^a, Xinhou Liu ^{*a}

1. poling detailed parameters

Table 1 Contact poling parameters and EO coefficients (r_{33}).

y1 chromophore (wt%)	T_g (°C) ^a	T_p (°C) ^b	Time(min) ^c	r_{33} (pm/V) ^d
10	149	144	10	54
15	146	141	10	82
20	138	133	10	128
25	134	129	10	159
y2 chromophore (wt%)				
10	148	143	10	41
15	144	139	10	62
20	137	132	10	90
25	130	125	10	102

^a Glass transition temperature (T_g) was measured by DSC with a heating rate of 10°C/min in nitrogen.

^b Poling temperature.

^c Poling time.

^d pm/V, electro-optic coefficients, measured by simple-reflection technique at 1310 nm.

Table2 Corona poling parameters and EO coefficients (r_{33}).

γ 1chromophore (wt%)	T_g ($^{\circ}$ C) ^a	T_p ($^{\circ}$ C) ^b	V_p (kV) ^c	Time(min) ^d	r_{33} (pm/V) ^e
10	149	159	11	10	57
15	146	156	11	10	85
20	138	148	11	10	132
25	134	144	11	10	163
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γ 2 chromophore (wt%)					
10	148	158	11	10	43
15	144	154	11	10	63
20	137	147	11	10	94
25	130	140	11	10	105

^a Glass transition temperature (T_g) was measured by DSC with a heating rate of 10 $^{\circ}$ C/min in nitrogen.

^b Poling temperature.

^c Poling voltage.

^d Poling time.

^e pm/V, electro-optic coefficients, measured by simple-reflection technique at 1310 nm.

2. r_{33} Measurement

The r_{33} values were measured using the Teng-Man simple reflection technique at the wavelength of 1310 nm using a carefully selected thin ITO electrode with low reflectivity and good transparency in order to minimize the contribution from the multiple reflections. ¹ Teng-Man reflection method provides us with a reasonable estimate of the EO performance when performed very carefully. However, some drawbacks of this method are pointed out both from practical and intrinsic viewpoints in many papers. So in table 3 we described the sample structures including ITO, EO film, and glass substrate thicknesses in detail to obtain the accurate results.²⁻⁴ We have measured the standard samples LiNbO₃ to confirm the accuracy of our results and the error bar in using the measurement system is 10%. ⁵

Table 3 the detailed parameter of the r_{33} measurements

n	$d_{\text{ITO}}(\text{nm})$	$d_{\text{film}}(\mu\text{m})$	$d_{\text{glass}}(\text{mm})$	Angle of incidence.
1.5	40	2-3	3	45°

3. Reference

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