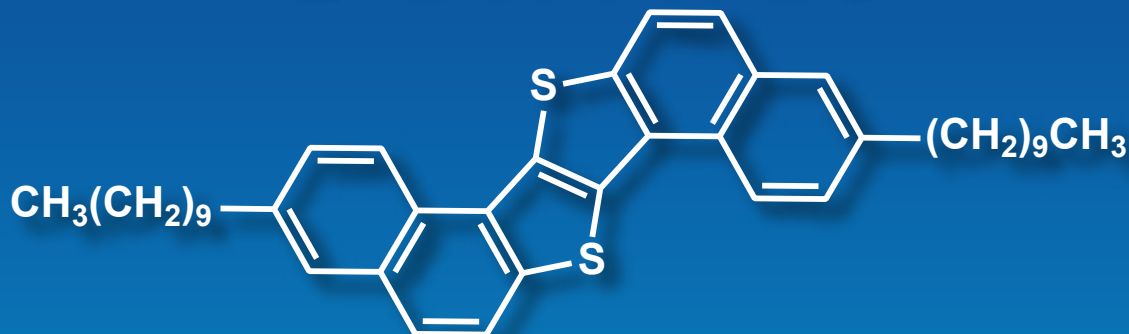


New

MATERIALS



# High Performance S-shaped Organic Semiconductor S-DNTT-10

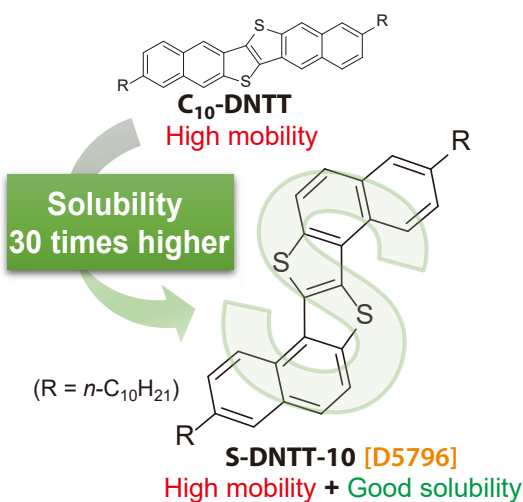


S-DNTT-10 [for organic electronics]  
100mg / 250mg  
[D5796]

## Advantages

- High hole mobility >10 cm<sup>2</sup>/Vs (Dip-coating method)
- Applicable to both dry and wet processes
- High durability

## Device Characteristics



## Performance of Dip-Coated OFETs Based on S-DNTT-10 [D5796]

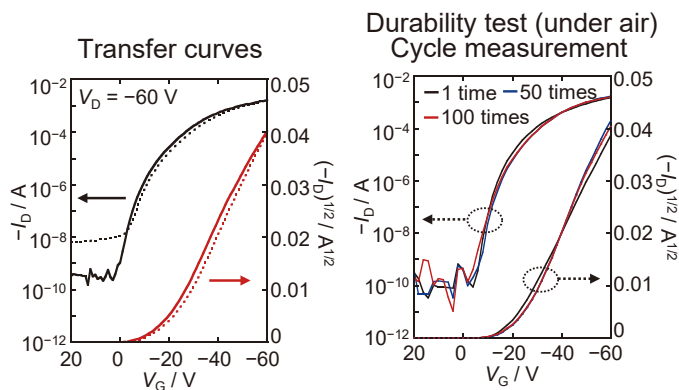


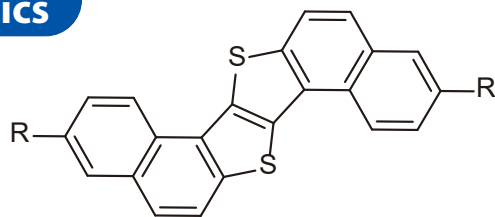
Table 1. Characteristics of OFETs based on S-DNTT-10 [D5796]

| Fabrication method   | Surface modification<br>Si/SiO <sub>2</sub> substrate | Maximum mobility<br>(cm <sup>2</sup> /Vs) | Threshold voltage<br>(V) | on/off          |
|----------------------|---|---|--------------------------|-----------------|
| Wet<br>(Dip-coating) | w/o<br>(bare)   | 11  | -17                      | 10 <sup>7</sup> |
| Vacuum deposition    | w/o<br>(bare)   | 3.5                                       | -8                       | 10 <sup>7</sup> |

Reference Y. Yamaguchi, Y. Kojiguchi, S. Kawata, T. Mori, K. Okamoto, M. Tsutsui, T. Koganezawa, H. Katagiri, T. Yasuda, *Chem. Mater.* **2020**, 32, 5350–5360.  
DOI: <https://doi.org/10.1021/acs.chemmater.0c01740>

# High Performance S-shaped Organic Semiconductor S-DNTT-10

## Characteristics



**S-DNTT-*n*<sup>1)</sup>**  
(*n* = 4, 6, 8, 10)

R =  $-(\text{CH}_2)_3\text{CH}_3$  (*n* = 4)

R =  $-(\text{CH}_2)_5\text{CH}_3$  (*n* = 6)

R =  $-(\text{CH}_2)_7\text{CH}_3$  (*n* = 8)

R =  $-(\text{CH}_2)_9\text{CH}_3$  (*n* = 10)

Table 2. Physical property data <sup>1)</sup>

| Compound                                | Solubility <sup>a</sup><br>(mmol/L) | HOMO<br>(eV)       | Mobility<br>(cm <sup>2</sup> /Vs) |                  |
|---|-------------------------------------|--------------------|-----------------------------------|------------------|
|   |                                     |                    | Vacuum deposition <sup>b</sup>    | Wet process      |
| <b>S-DNTT-4</b>                         | 19.4                                | -5.3               | 0.16                              | 3.5 <sup>c</sup> |
| <b>S-DNTT-6</b>                         | 9.7                                 | -5.3               | 1.6 × 10 <sup>-3</sup>            | 6.8 <sup>c</sup> |
| <b>S-DNTT-8</b>                         | 8.0                                 | -5.3               | 2.7                               | 5.7 <sup>c</sup> |
| <b>S-DNTT-10</b><br>[D5796]             | 3.7                                 | -5.3               | 3.5                               | 11 <sup>c</sup>  |
| <b>C<sub>10</sub>-DNTT<sup>2)</sup></b> | ~0.12 <sup>2)</sup>                 | -4.9 <sup>3)</sup> | 3.7 <sup>2)</sup>                 | 11 <sup>4)</sup> |

<sup>a</sup>Data obtained in toluene at 60 °C. <sup>b</sup>Data obtained using Si/SiO<sub>2</sub> (bare) substrates. <sup>c</sup>Dip-coating method.

### References:

- 1) Y. Yamaguchi, Y. Kojiguchi, S. Kawata, T. Mori, K. Okamoto, M. Tsutsui, T. Koganezawa, H. Katagiri, T. Yasuda, *Chem. Mater.* **2020**, 32, 5350–5360.
- 2) M. J. Kang, I. Doi, H. Mori, E. Miyazaki, K. Takimiya, M. Ikeda, H. Kuwabara, *Adv. Mater.* **2011**, 23, 1222–1225.
- 3) K. Takimiya, I. Osaka, T. Mori, M. Nakano, *Acc. Chem. Res.* **2014**, 47, 1493–1502.
- 4) K. Nakayama, Y. Hirose, J. Soeda, M. Yoshizumi, T. Uemura, M. Uno, W. Li, N. J. Kang, M. Yamagishi, Y. Okada, E. Miyazaki, Y. Nakazawa, A. Nakao, K. Takimiya, J. Takeya, *Adv. Mater.* **2011**, 23, 1626–1629.

**S-DNTT-10 has a product specification for the hole mobility of >3.0 cm<sup>2</sup>/Vs (vacuum deposition method, bare substrate) on OFET devices.**

## Related Products

High-performance p-type organic semiconductor

**Ph-BTBT-10** [for organic electronics]

100mg / 250mg / 1g [D5491]

High-performance n-type organic semiconductor

**TU-1** [for organic electronics]

100mg / 250mg [T3922]

**TU-3** [for organic electronics]

100mg / 250mg [T3924]

## Organic Transistor Webpage



TCI has released a new page for organic transistors which includes product details, device fabrication and evaluation data, and its physical properties (e.g. UV-Vis spectra and 2D-GIXD data).

<https://bit.ly/33zmkIX> or



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