Donor-acceptor-donor conjugated oligomers based on isoindigo and anthra[1,2-b]thieno[2,3-d]thiophene for organic thin-film transistors: effect of alkyl side chain length on semiconducting properties

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Figure S1. MALDI-TOF MS of all the three oligomers.

Figure S2. Thermogravimetric analysis (TGA) curves of all the three oligomers.

Table S1. OTFT device performance of 2ATT-IID-C8C10, 2ATT-IID-C6C8 and 2ATT-IID-C4C6 annealed at other temperatures.

Figure S3. Representative output and transfer characteristics of OTFT devices based on thermally annealed films of 2ATT-IID-C8C10. The annealing was done in nitrogen for 15 minutes at 60 °C and 150 °C.

Figure S4. Representative output and transfer characteristics of OTFT devices based on thermally annealed films of 2ATT-IID-C6C8. The annealing was done in nitrogen for 15 minutes at 60 °C and 150 °C.

Figure S5. Representative output and transfer characteristics of OTFT devices based on thermally annealed films of 2ATT-IID-C4C6. The annealing was done in nitrogen for 15 minutes at 150 °C and 200 °C.
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<table>
<thead>
<tr>
<th>Oligomer</th>
<th>T_a (°C)</th>
<th>( \mu_{\text{max}}/\mu_{\text{ave}} ) (cm² V⁻¹ s⁻¹)</th>
<th>( V_T ) (V)</th>
<th>( I_{on}/I_{off} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>2ATT-IID-C8C10</td>
<td>60</td>
<td>0.028/0.023</td>
<td>-14 ~ -3</td>
<td>( 10^4 \sim 10^5 )</td>
</tr>
<tr>
<td></td>
<td>150</td>
<td>0.022/0.020</td>
<td>-10 ~ -2</td>
<td>( 10^4 \sim 10^5 )</td>
</tr>
<tr>
<td>2ATT-IID-C6C8</td>
<td>60</td>
<td>0.10/0.076</td>
<td>-12 ~ -1</td>
<td>( 10^4 \sim 10^7 )</td>
</tr>
<tr>
<td></td>
<td>150</td>
<td>0.022/0.016</td>
<td>-9 ~ -2</td>
<td>( 10^4 \sim 10^7 )</td>
</tr>
<tr>
<td>2ATT-IID-C4C6</td>
<td>150</td>
<td>0.43/0.39</td>
<td>-15 ~ -10</td>
<td>( 10^5 \sim 10^8 )</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>0.60/0.50</td>
<td>-16 ~ -12</td>
<td>( 10^5 \sim 10^8 )</td>
</tr>
</tbody>
</table>

aThermal annealing was carried out in nitrogen for 15 min. bMobility calculated from saturation regime, and average mobility was calculated from more than 5 parallel devices. cThreshold voltage. dCurrent on/off ratio.

Figure S3. Representative output (a, c) and transfer characteristics (b, d) of OTFT devices based on thermally annealed films of 2ATT-IID-C8C10. The annealing was done in nitrogen for 15 minutes at 60 °C (a, b) and 150 °C (c, d).
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**Figure S4.** Representative output (a, c) and transfer characteristics (b, d) of OTFT devices based on thermally annealed films of 2ATT-IID-C6C8. The annealing was done in nitrogen for 15 minutes at 60 °C (a, b) and 150 °C (c, d).

**Figure S5.** Representative output (a, c) and transfer characteristics (b, d) of OTFT devices based on thermally annealed films of 2ATT-IID-C4C6. The annealing was done in nitrogen for 15 minutes at 150 °C (a, b) and 200 °C (c, d).