Supporting Information

Synthesis and optical reactivity of 6,13-α-diketoprecursors of 2,3,9,10-tetraalkylopentacenes in solution, film and crystals

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### Table S1: Solubility of Et-PDK and PDK.

<table>
<thead>
<tr>
<th></th>
<th>Toluene</th>
<th>CH₂Cl₂</th>
<th>Hexane</th>
<th>THF</th>
<th>EtOAc</th>
<th>Et₂O</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDK</td>
<td>3.6</td>
<td>12</td>
<td>1.4</td>
<td>8.8</td>
<td>2.1</td>
<td>1.1</td>
</tr>
<tr>
<td>Et-PDK</td>
<td>16</td>
<td>61</td>
<td>1.5</td>
<td>28</td>
<td>4.1</td>
<td>1.6</td>
</tr>
</tbody>
</table>

![Figure S1](image1.png)

**Figure S1.** Photoreaction of Et-PDK to Et-PEN in toluene under Ar atmosphere.

![Figure S2](image2.png)

**Figure S2.** Photoreaction of Pr-PDK to Pr-PEN in toluene under Ar atmosphere.
Figure S3. Photoreaction of Hex-PDK to Hex-PEN in toluene under Ar atmosphere.

Figure S4. Absorption (black line) and fluorescent (black dotted-line, excited at 540 nm) spectra of Pr-PEN in toluene.

Figure S5. Absorption (black line) and fluorescent (black dotted-line, excited at 541 nm) spectra of Hex-PEN in toluene.
Figure S6. Change on absorption spectra before- and after-photoreaction of Pr-PDK in film.

Figure S7. Change on IR spectra before- and after-photoreaction of Pr-PDK in film.
Figure S8. Change on absorption spectra before- and after-photoreaction of Hex-PDK in film.

Figure S9. Change on IR spectra before- and after-photoreaction of Hex-PDK in film.

Figure S9. $I-V$ curve of Et-PEN (light green) and Pr-PEN (dark green) measured by SCLC method.
$^1$H-NMR spectrum of 6a in CDCl$_3$. 
$^{13}$C-NMR spectrum of 6a in CDCl$_3$. 
$^{1}$H-NMR spectrum of 6b in CDCl$_3$. 
$^{13}$C-NMR spectrum of 6b in CDCl$_3$. 
$^1$H-NMR spectrum of 6c in CDCl₃.
$^{13}$C-NMR spectrum of 6c in CDCl$_3$. 
$^1$H-NMR spectrum of 7a in CDCl$_3$. 
$^{13}$C-NMR spectrum of 7a in CDCl$_3$. 
$^1$H-NMR spectrum of 7b in CDCl$_3$. 
$^{13}$C-NMR spectrum of 7b in CDCl$_3$. 
$^1$H-NMR spectrum of 7c in CDCl$_3$. 
$^{13}$C-NMR spectrum of 7c in CDCl$_3$. 
$^1$H-NMR spectrum of Et-PDK in CDCl$_3$. 
$^{13}$C-NMR spectrum of Et-PDK in CDCl$_3$. 
$^1$H-NMR spectrum of Pr-PDK in CDCl$_3$. 
$^{13}$C-NMR spectrum of Pr-PDK in CDCl$_3$. 
$^1$H-NMR spectrum of Hex-PDK in CDCl$_3$. 
$^{13}$C-NMR spectrum of Hex-PDK in CDCl$_3$. 