

# Supporting material

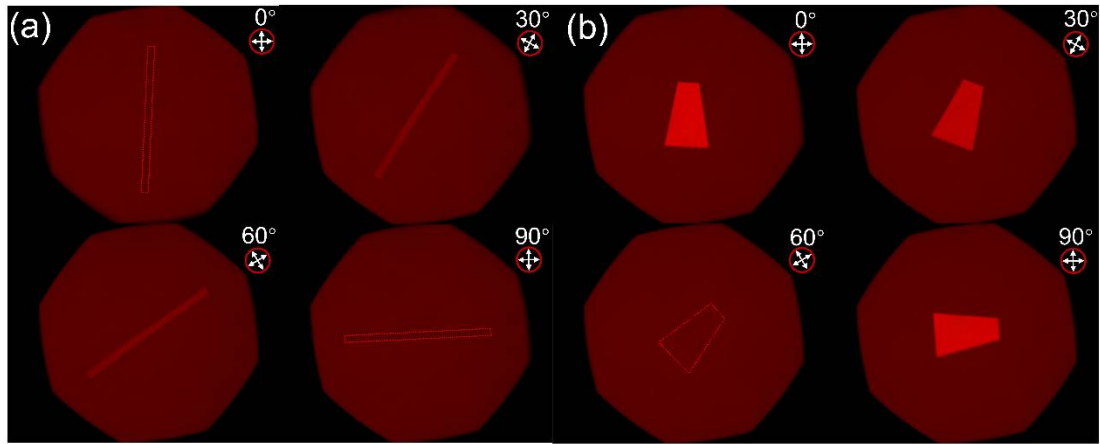
## Morphology dependent optoelectronic properties of pentacene nanoribbon and nanosheet crystallite

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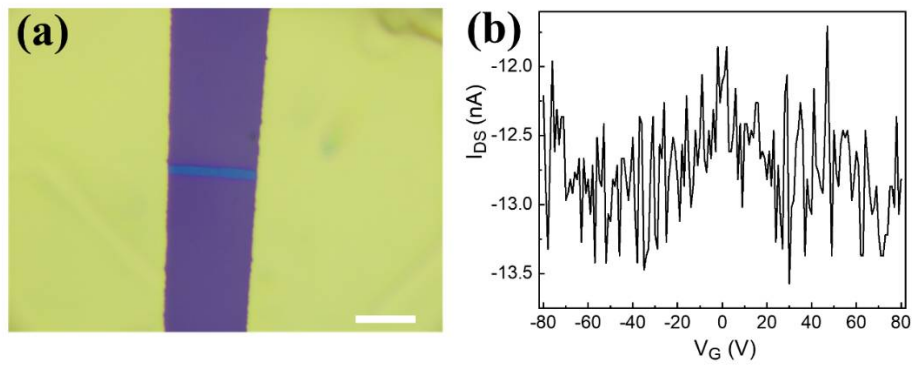
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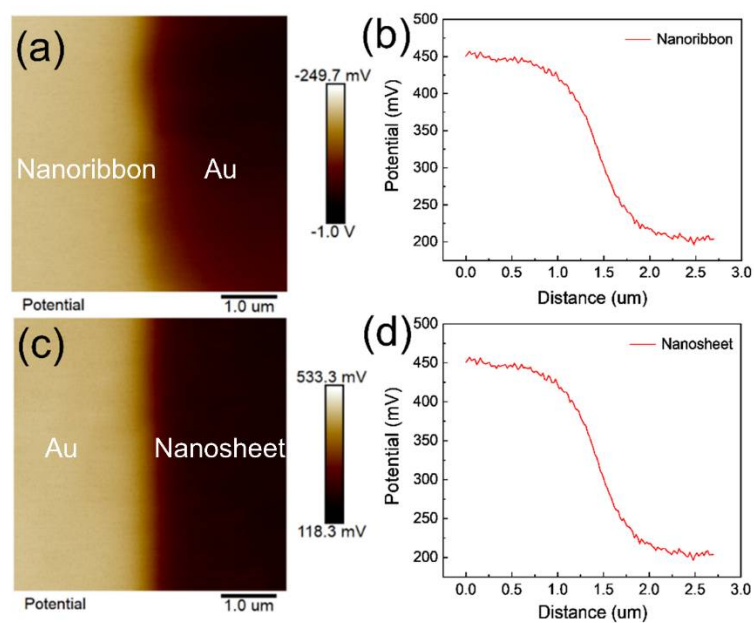
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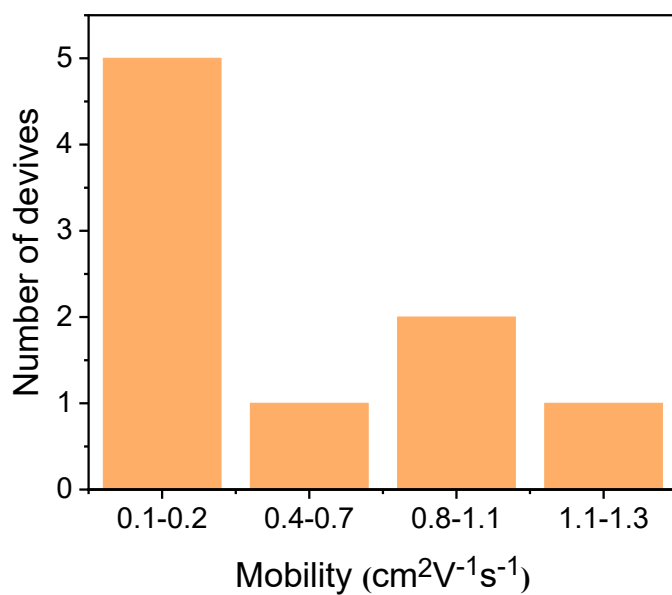
**Figure S1.** The Cross-polarized optical microscopy images of (a) the nanoribbon crystal and (b) nanosheet crystal in different polarization directions.



**Figure S2.** (a) Microscopy image of a representative nanoribbon crystal device. Scale bar: 5  $\mu\text{m}$ . (b) The corresponding transfer curve of device based on the nanoribbon crystal.



**Figure S3.** The KPFM images of (a) the nanoribbon crystal device and (c) the nanosheet crystal device, respectively. The corresponding surface potential profiles of (b) the nanoribbon crystal device and (d) the nanosheet crystal device.



**Figure S4.** Carrier mobility distribution of 10 OFETs fabricated on pentacene sheet-like single crystals.