Electronic Supplementary Information (ESI) for:

Bending TIPS-pentacene Single Crystals: From Morphology to Transistor Performance

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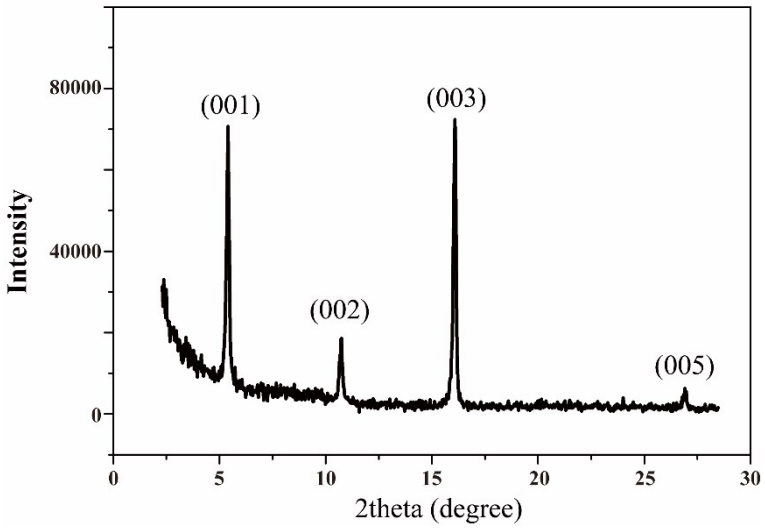

Figure S1. The out-of-plane X-ray diffraction (XRD) image of the TIPS-pentacene single crystals.

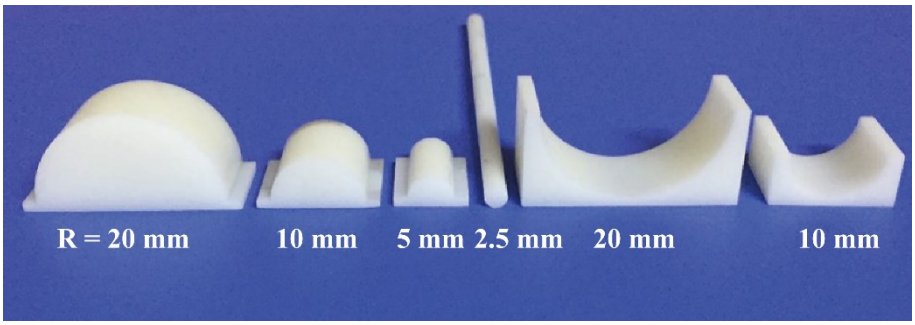

Figure S2. The shapes of bending moulds.

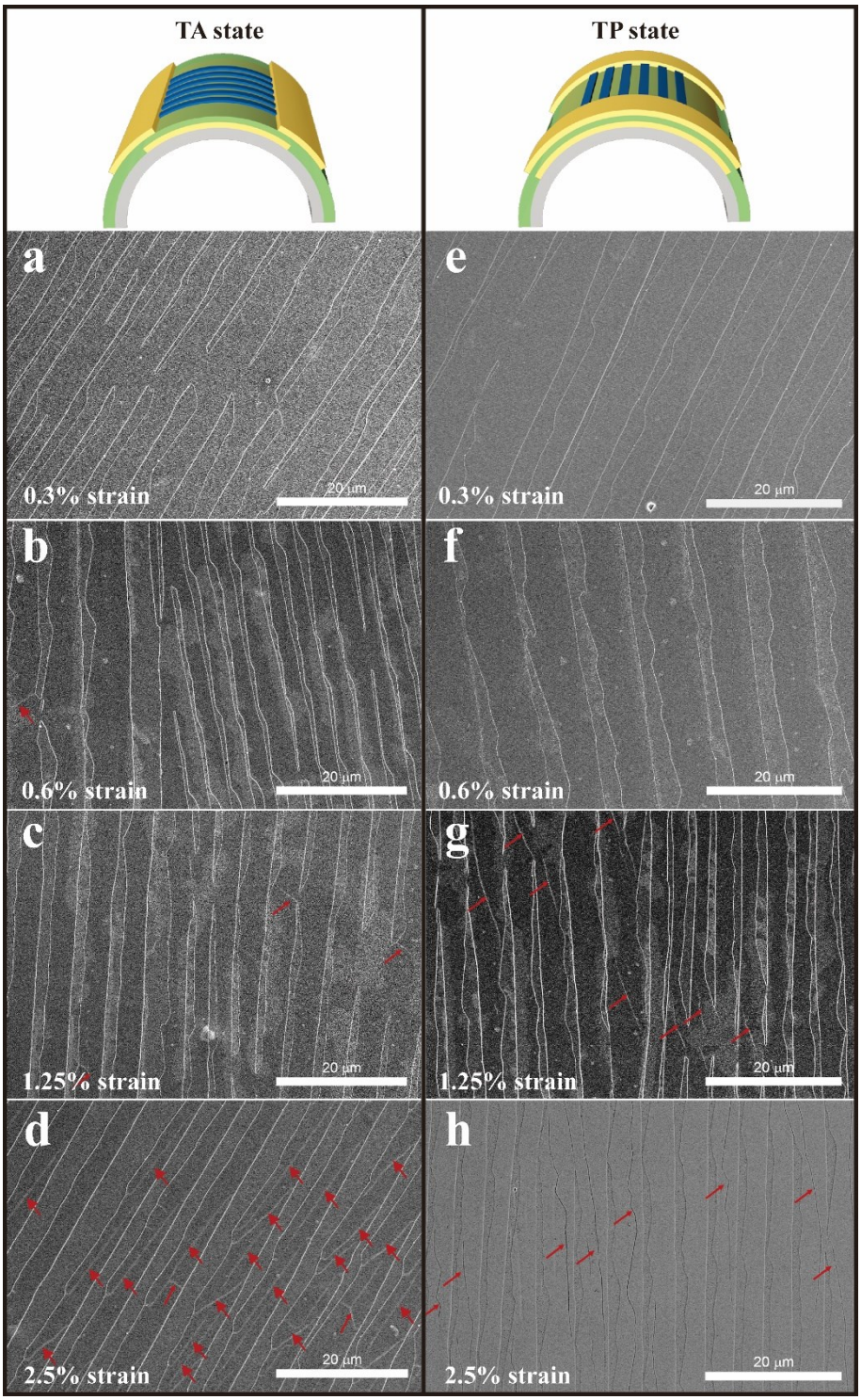

Figure S3. The scanning electron microscope (SEM) images of crystals under tensile state. (a-d) Under TA state, bending strain are equal to 0.3% (a), 0.6% (b), 1.25% (c), 2.5% (d), respectively; (e-h) Under TP state, bending strain are equal to 0.3% (e), 0.6% (f), 1.25% (g), 2.5% (h), respectively.

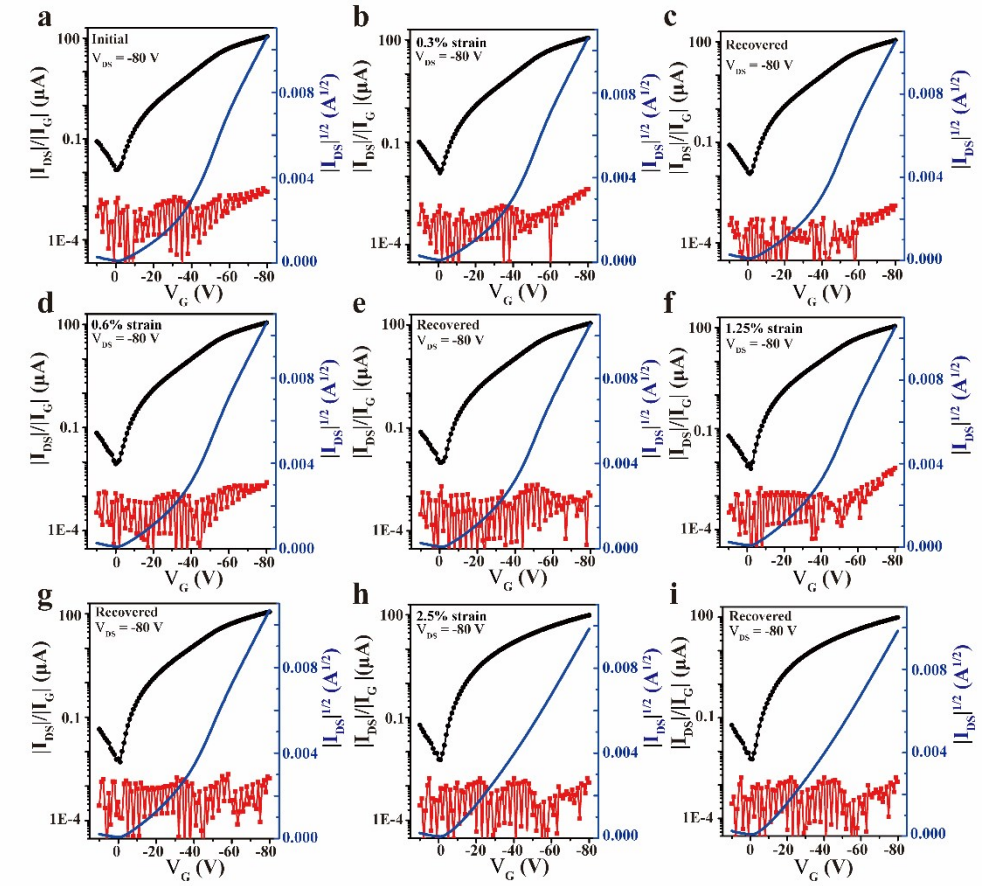

Figure S4. The typical transfer characteristics of a flexible transistor device under different TA states. (a) Initial state, there is no bending strain. (b) Bending state, bending strain = 0.3%. (c) Recovery state, recover from 0.3% bending strain to initial state. (d) Bending state, bending strain = 0.6%. (e) Recovery state, recover from 0.6% bending strain to initial state. (f) Bending state, bending strain = 1.25%. (g) Recovery state, recover from 1.25% bending strain to initial state. (h) Bending state, bending strain = 2.5%. (i) Recovery state, recover from 2.5% bending strain to initial state.

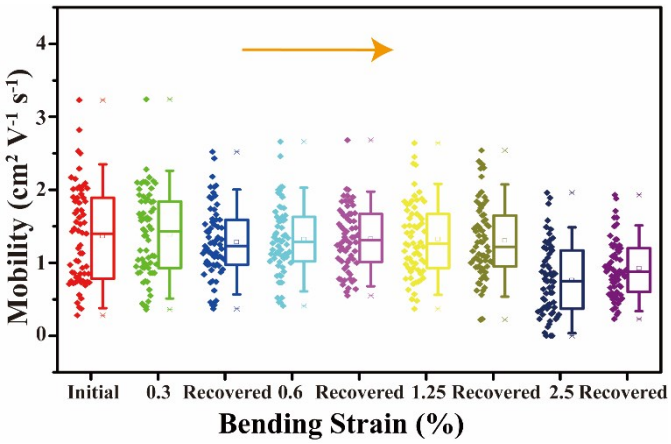

Figure S5. The mobility statistical diagrams of 50 transistor devices under TA state.

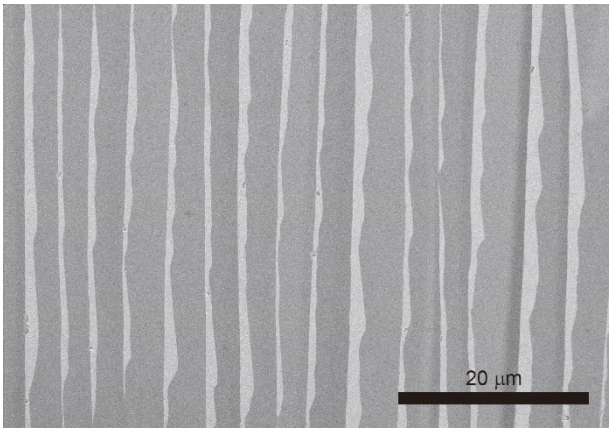

Figure S6. The bottom surface morphology of crystals under TA state, bending strain = 1.25%.

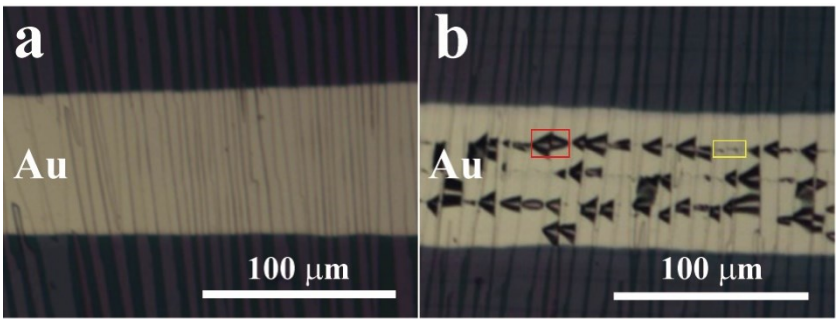

Figure S7. The morphology of the gold electrode under TA state, bending strain = 1.25% (a), 2.5% (b). The red box indicates a location of delamination, and the yellow box indicates a location of crack.

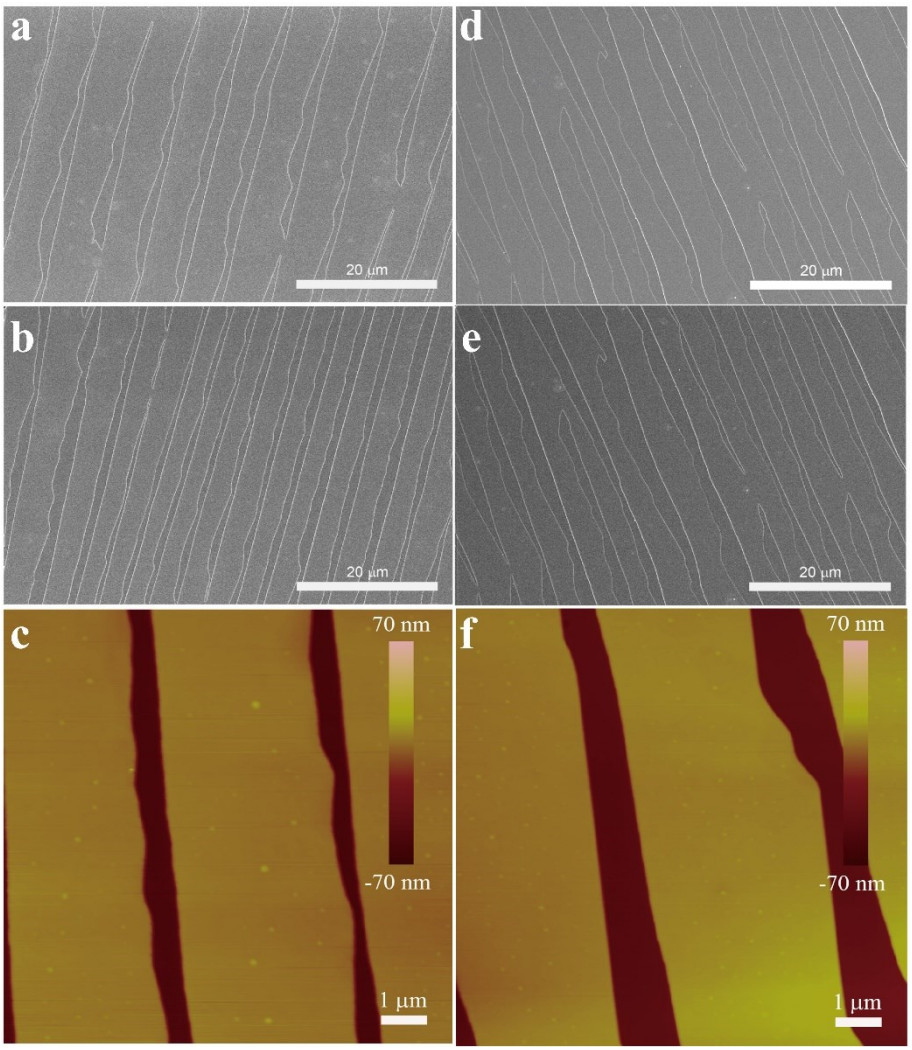

Figure S8. The morphology of crystals under compressive state, the bending strain was 0.3% here. (a-c) The SEM images of crystals under CA state (a), after CA state (b), and the AFM image of crystals after CA state (c). (d-f) The SEM images of crystals under CP state (d), after CP state (e), and the AFM image of crystals after CP state (f).

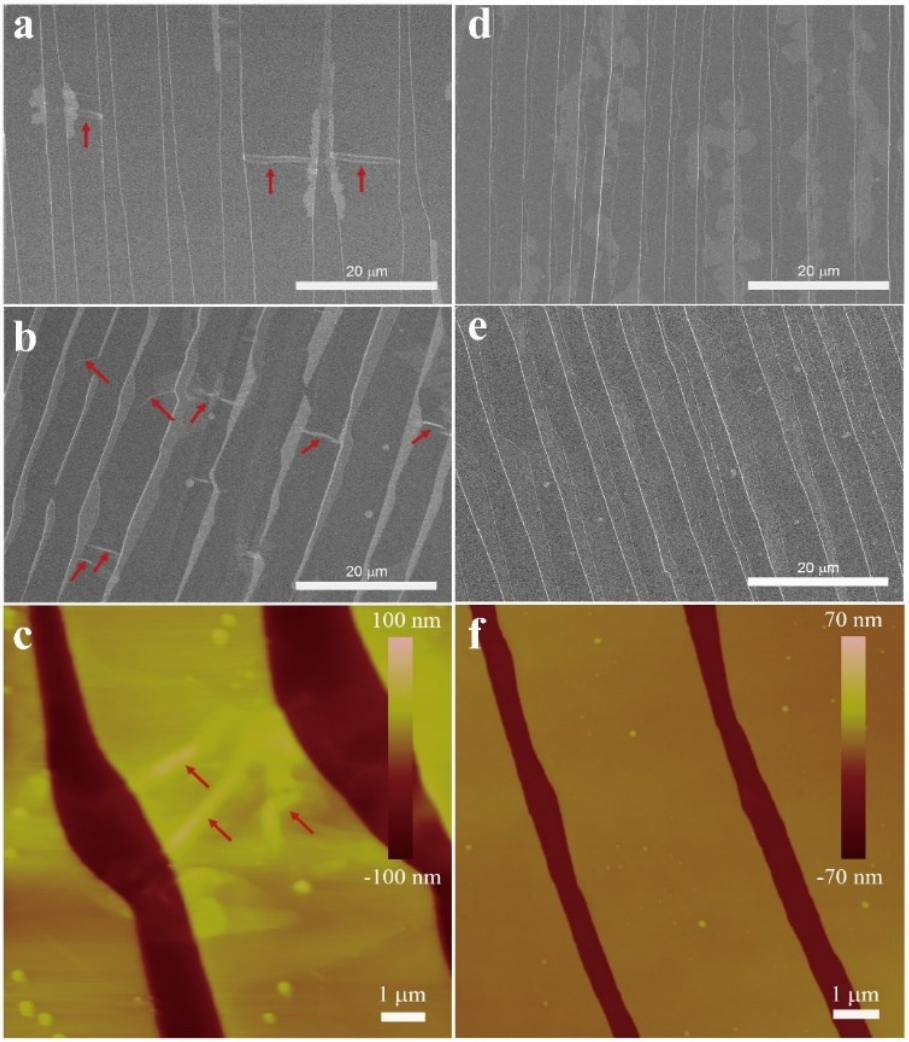

Figure S9. The morphology of crystals under compressive state, the bending strain was 0.6% here. (a-c) The SEM images of crystals under CA state (a), after CA state (b), and the AFM image of crystals after CA state (c). (d-f) The SEM images of crystals under CP state (d), after CP state (e), and the AFM image of crystals after CP state (f).

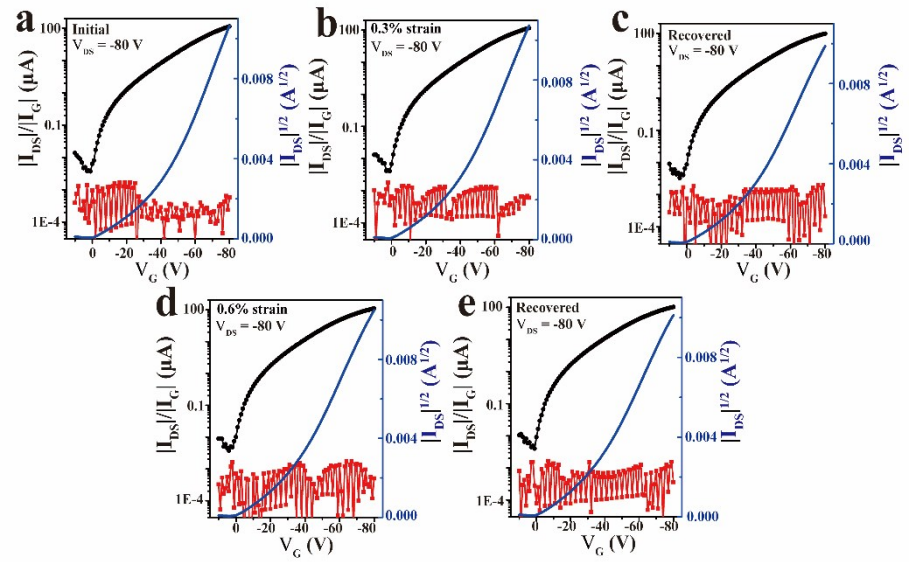

Figure S10. The typical transfer characteristics of a flexible transistor device under different CA states. (a) Initial state, there is no bending strain. (b) Bending state, bending strain = 0.3%. (c) Recovery state, recover from 0.3% bending strain to initial state. (d) Bending state, bending strain = 0.6%. (e) Recovery state, recover from 0.6% bending strain to initial state.

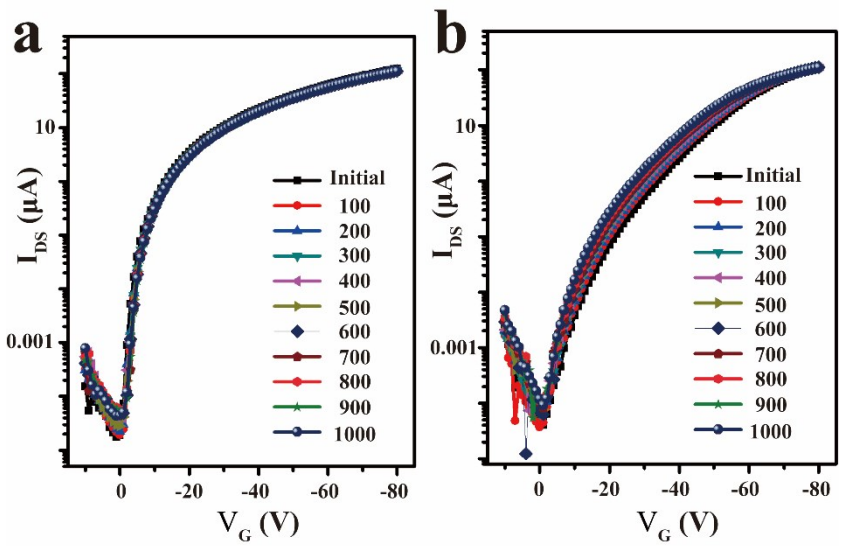

Figure S11. The typical transfer characteristics of the flexible transistor device in bending cycle test (bending strain = 0.6%) in TA (a), CA (b) situation.

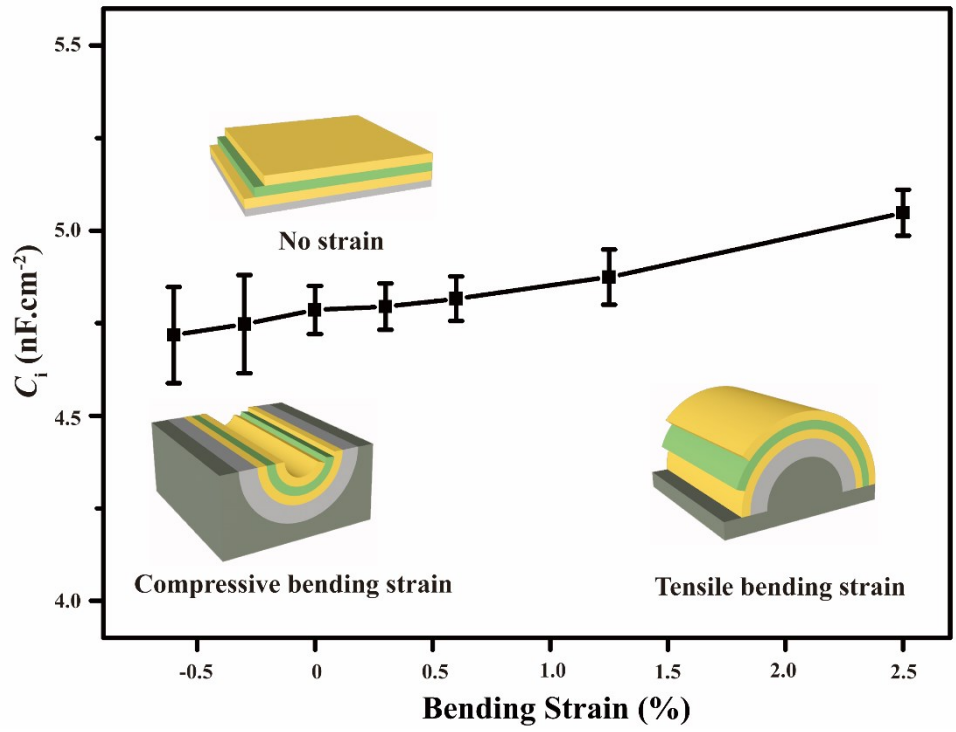

Figure S12. The areal capacitance (C_i) of the dielectric layer in different bending states.