

Supporting Information

High-Performance Organic Field-Effect Transistors with Low-Cost Copper Electrodes

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Table S1. Detailed performances of the pentacene and tetracene top contact OFETs with PVP dielectric layer and the varied metal electrodes.

	Pentacene			Tetracene		
	Mobility (cm ² /V.s)	I _{on} /I _{off}	V _T (V)	Mobility (cm ² /V.s)	I _{on} /I _{off}	V _T (V)
Au	0.14	10 ⁴	−9	0.033	10 ⁴	−23
Ag	0.05	10 ⁵	−13	0.0006	10 ³	−20
Cu	0.15	10 ⁵	−10	0.052	10 ⁶	−8

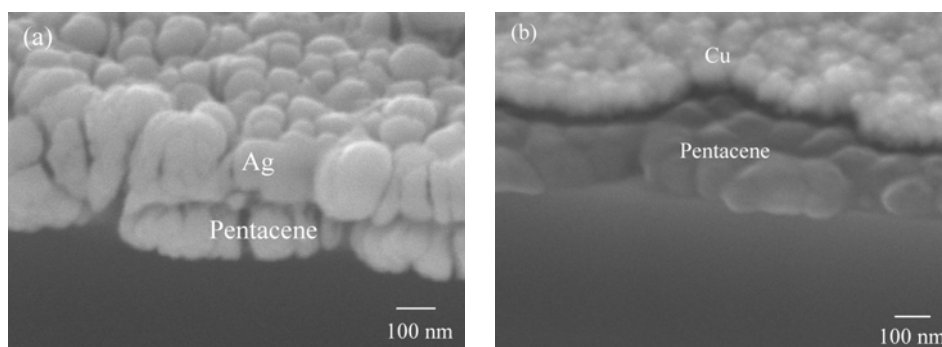


Figure S1. SEM images of the cross section of the metal film deposited on pentacene. a) Ag on pentacene, b) Cu on pentacene. Dramatically penetration of Ag atom into pentacene layer and good Cu/pentacene contact were observed, respectively.

X-ray photoelectron spectroscopy data were obtained with an ESCALab220i-XL electron spectrometer from VG Scientific using 300W AlK α radiation. The base pressure was about 3×10^{-9} mbar. The binding energies were referenced to the C1s line at 284.8 eV from adventitious carbon.

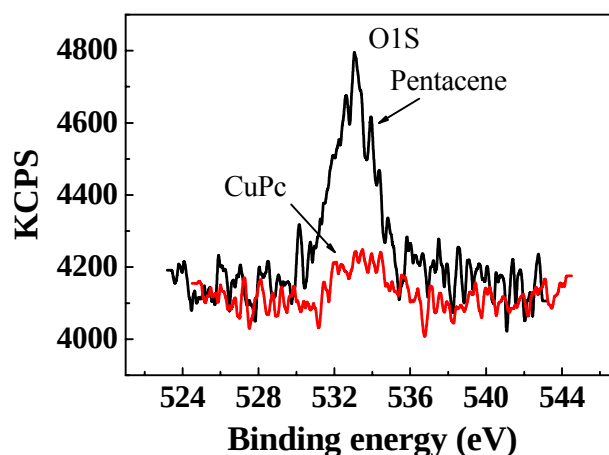


Figure S2. O1s of pentacene layer and CuPc layer by XPS measurement of organic active layer. Strong O1s peak of pentacene layer indicate that the O₂ can be absorbed on the pentacene layer even under high vacuum.

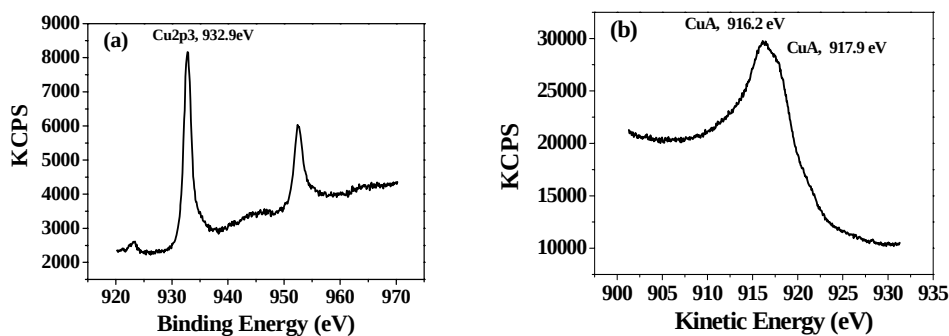


Figure S3. a) Cu2p3 peak of Cu electrode surface. b) Cu auger optoelectronic energy spectrum peak of Cu electrode surface, the peak at 916.2eV indicates the existence of Cu⁺.

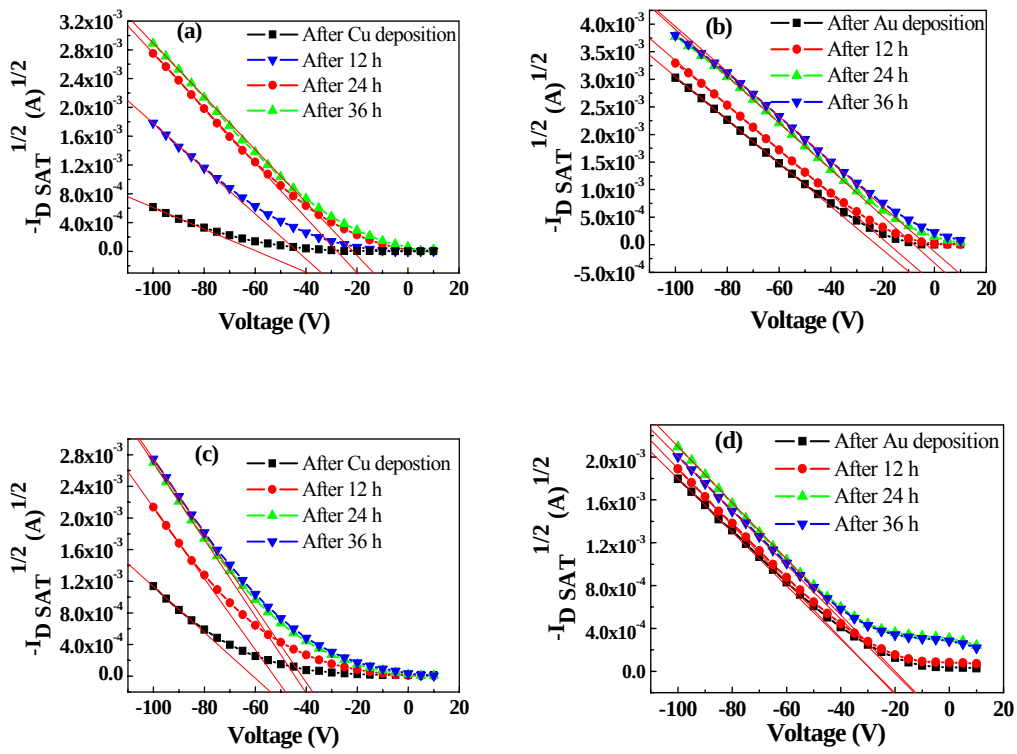


Figure S4. Transfer characteristics of the CuPc and VOPc based OFETs with the different source-drain electrodes as a function of store time under ambient atmosphere. a) CuPc based device with Cu electrode. b) CuPc based device with Au electrode. c) VOPc based device with Cu electrode. d) VOPc based device with Au electrode.