

Electronic Supplementary Information

Solvent and Polymer Matrix Effects on TIPS-Pentacene/Polymer Blend

Organic Field-Effect Transistors

**Do Kyung Hwang,^a Canek Fuentes-Hernandez^a, John D. Berrigan,^b Yunnan Fang,^b
Jungbae Kim,^a William J. Potscavage, Jr.,^a Hyeunseok Cheun,^a Kenneth H. Sandhage,^b
and Bernard Kippelen*^a**

^a *Center for Organic Photonics and Electronics (COPE)*

Air Force Center of Excellence on Bio-nano-enabled Inorganic/Organic Nanocomposites and Improved Cognition (BIONIC)

School of Electrical and Computer Engineering

Georgia Institute of Technology, Atlanta, Georgia 30332 (USA).

E-mail: kippelen@ece.gatech.edu

^b *Center for Organic Photonics and Electronics (COPE)*

Air Force Center of Excellence on Bio-nano-enabled Inorganic/Organic Nanocomposites and Improved Cognition (BIONIC)

School of Materials Science and Engineering

Georgia Institute of Technology, Atlanta, Georgia 30332 (USA).

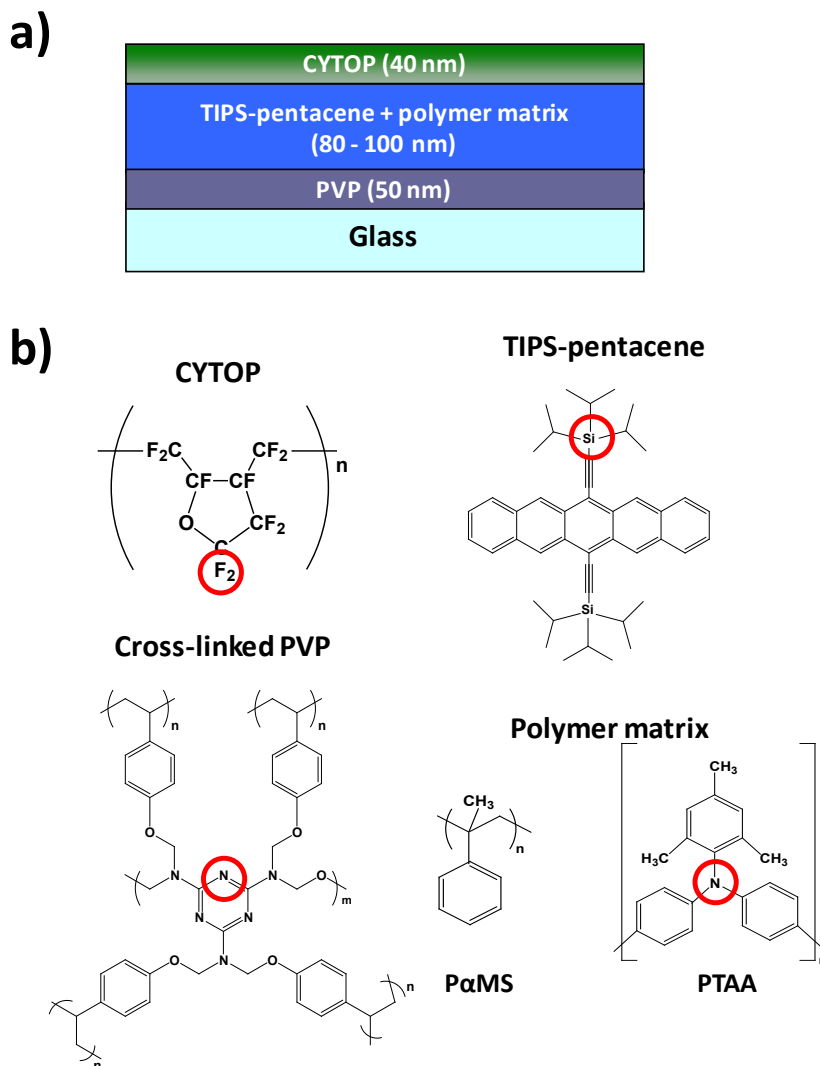


Figure S1. a) Film structures for XPS depth profiles and b) chemical structures of CYTOP, TIPS-pentacene, cross-linked PVP, and polymer matrices.

Figure S1a and S1b show film structures for XPS depth profiles and chemical structures of CYTOP, TIPS-pentacene, cross-linked PVP, and polymer matrices. The following elements (highlighted above) were attributed to each chemical component of the device: F 1s (from CYTOP), N 1s (from cross-linking agent of PVP and PTAA), and Si 2p (from TIPS-pentacene and glass substrate).

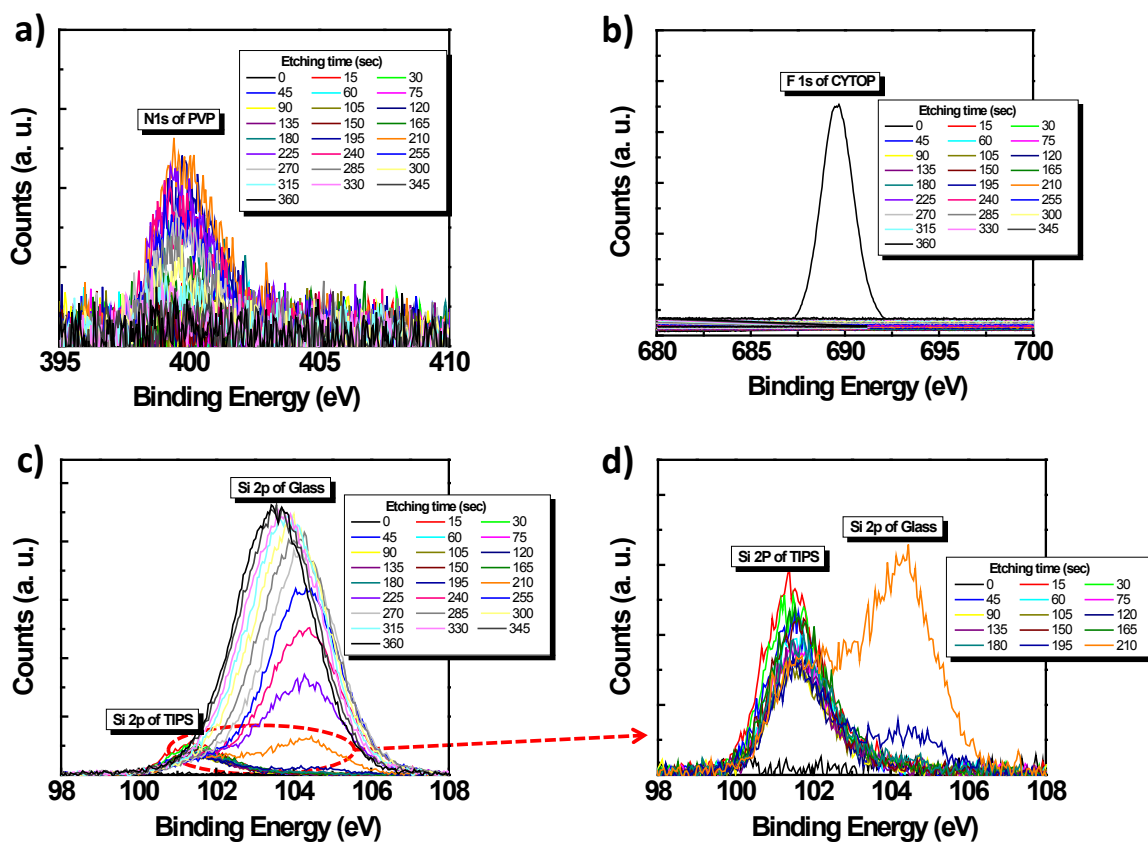


Figure S2. XPS spectra obtained from TIPS-pentacene/P α MS blend film from chlorobenzene; a) N 1s, b) F 1s, c) Si 2p, d) magnified Si 2p for TIPS.

Figure S2 shows XPS spectra of the N 1s, F 1s, and Si 2p observed after each milling cycle on a TIPS-pentacene/P α MS blend film from chlorobenzene. Si 2p photoelectrons from the silyl group in the TIPS-pentacene molecule have a significantly lower binding energy than Si 2p from Si-O bonding on the glass substrate as shown in Fig. S2d, allowing for determination of the TIPS-pentacene/glass substrate interface. The intensities for each component were normalized to the maximum intensity observed at the peak binding energy over all etching times (see Fig. 4a in the main manuscript) to analyze the vertical distribution of each component.

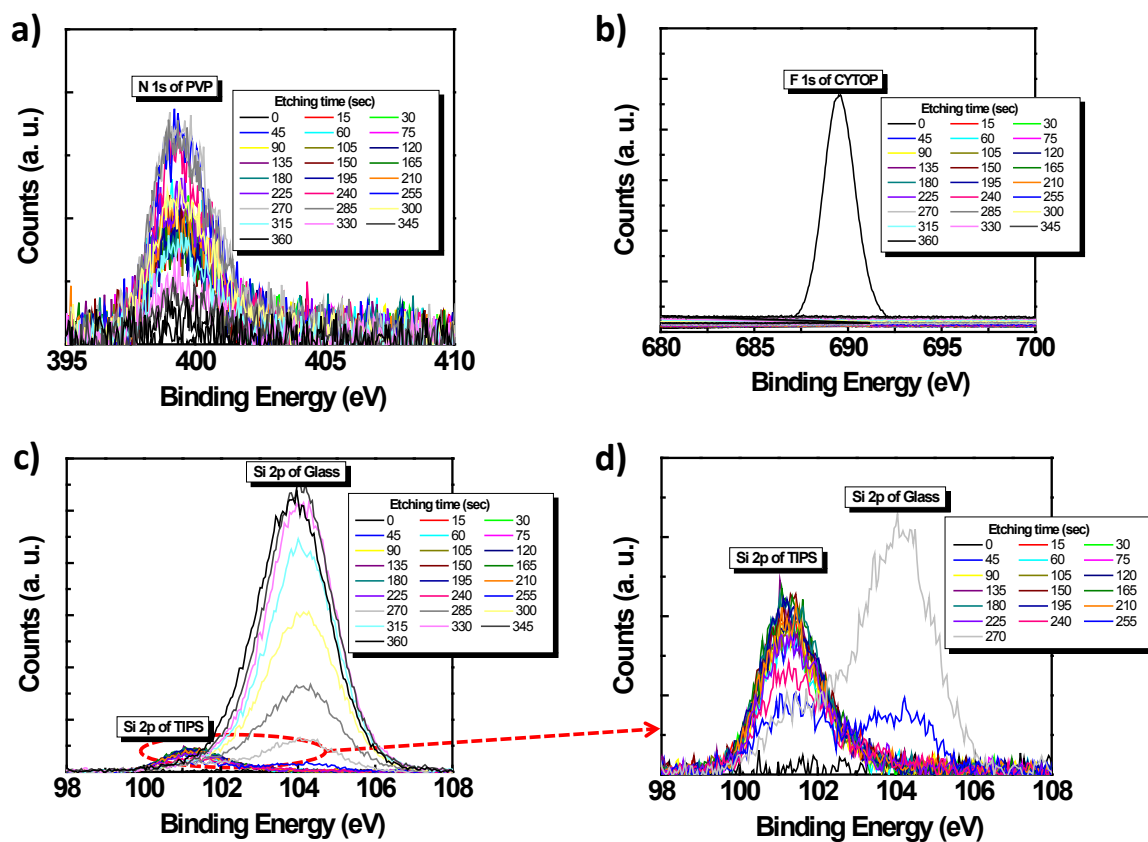


Figure S3. XPS spectra obtained from TIPS-pentacene/PTAA blend film from chlorobenzene; a) N 1s, b) F 1s, c) Si 2p, d) magnified Si 2p for TIPS.

Figure S3 shows XPS spectra of N 1s, F 1s, Si 2p after each milling cycle on a TIPS-pentacene/PTAA blend film from chlorobenzene. The intensities for each component were normalized to the maximum intensity observed at the peak binding energy over all etching times (see Fig. 4b in the main manuscript) to analyze the vertical distribution of each component.

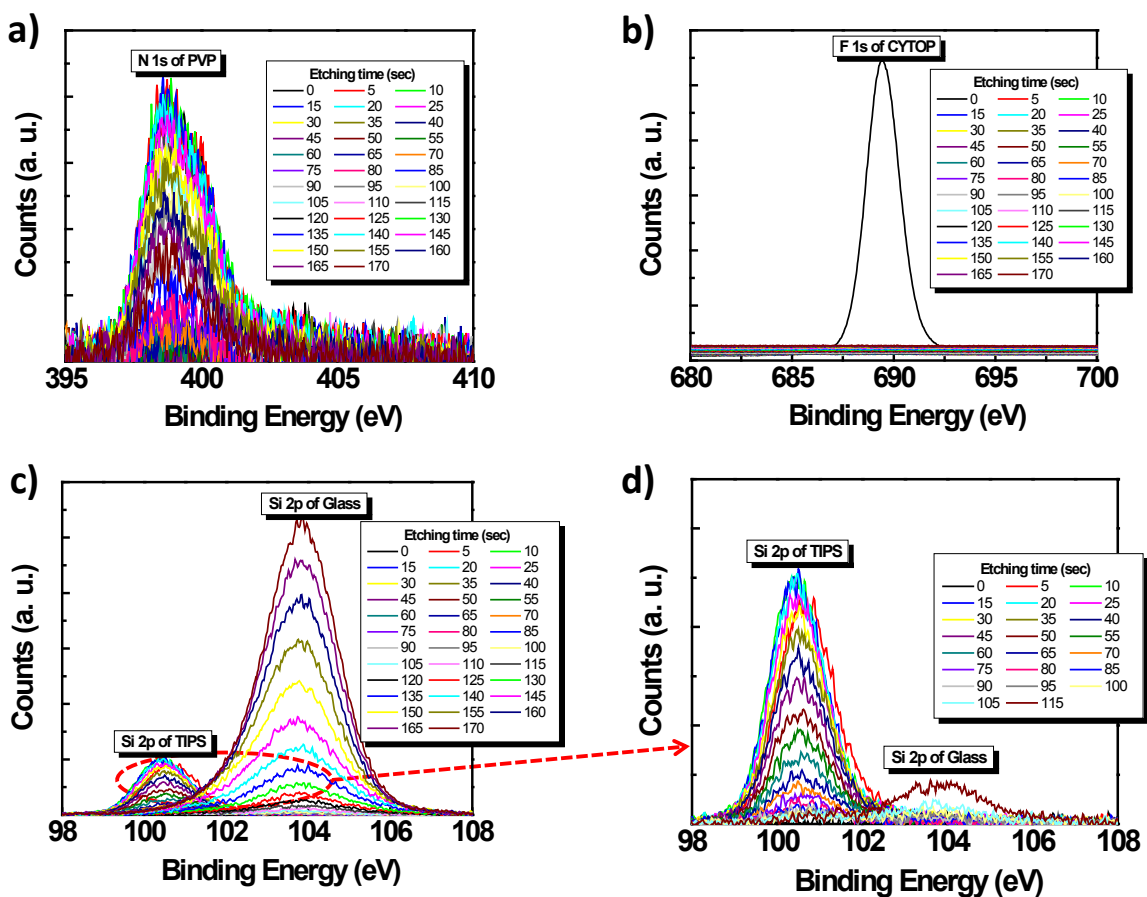


Figure S4. XPS spectra obtained from TIPS-pentacene/P α MS blend film from tetralin; a) N 1s, b) F 1s, c) Si 2p, d) magnified Si 2p for TIPS.

Figure S4 shows XPS spectra of N 1s, F 1s, Si 2p in each milling cycle obtained from TIPS-pentacene/P α MS blend film from tetralin. The intensities for each component were normalized to the maximum intensity observed at the peak binding energy over all etching times (see Fig. 4c in the main manuscript) to analyze the vertical distribution of each component.

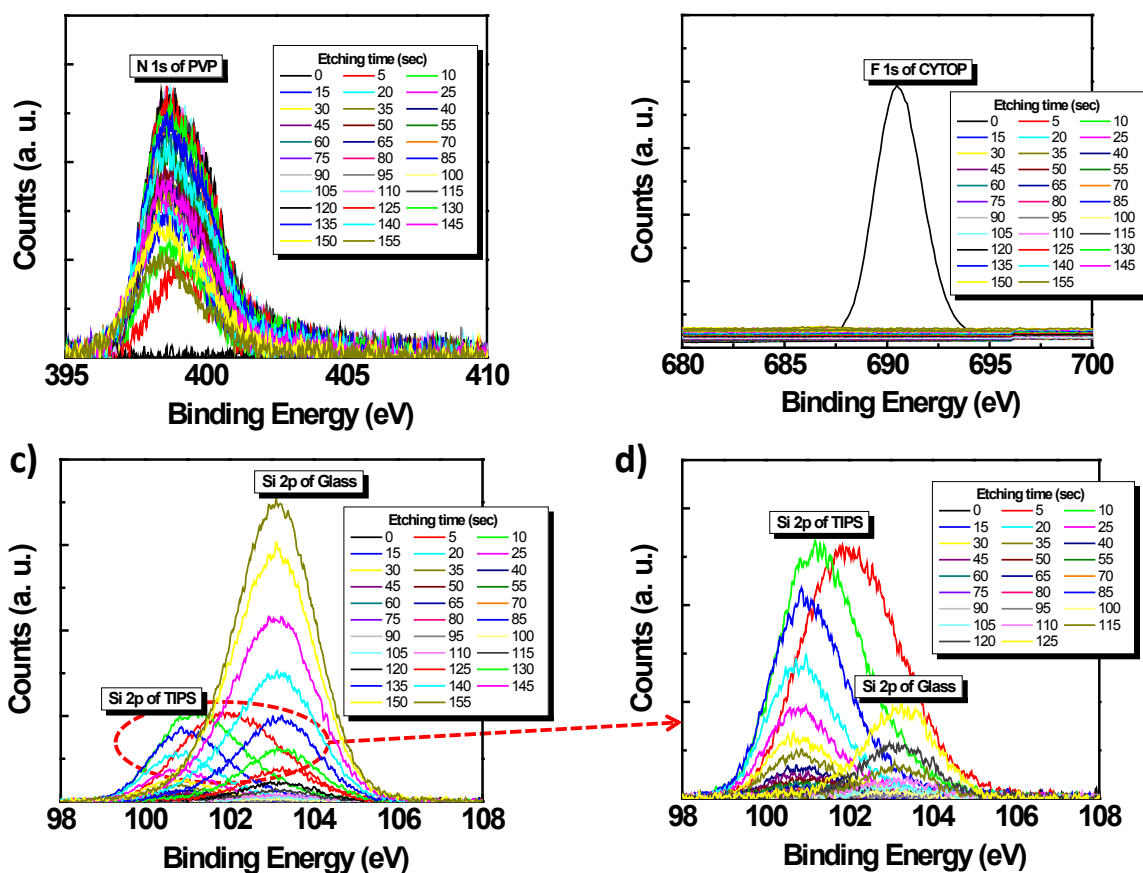


Figure S5. XPS spectra obtained from TIPS-pentacene/PTAA blend film from tetralin; a) N 1s, b) F 1s, c) Si 2p, d) magnified Si 2p for TIPS.

Figure S5 shows XPS spectra of N 1s, F 1s, Si 2p after each milling cycle on a TIPS-pentacene/PTAA blend film from tetralin. The intensities for each component were normalized to the maximum intensity observed at the peak binding energy over all etching times (see Fig. 4d in the main manuscript) to analyze the vertical distribution of each component.