Tunable Interfaces on Tetracene and Pentacene Thin-Films via Monolayers

Selma Piranej,[a] David A. Turner,[a] Shawn M. Dalke,[a] Haejun Park,[a] Brittni A. Qualizza,[a] Juvinch Vicente,[b] Jixin Chen,[b] Jacob W. Ciszek*[a]

Address

[a] Department of Chemistry and Biochemistry, Loyola University Chicago, Chicago, Illinois 60660, USA, Email: jciszek@luc.edu,

[b] Department of Chemistry and Biochemistry, Ohio University, Athens, Ohio 45701, USA

Table of Contents

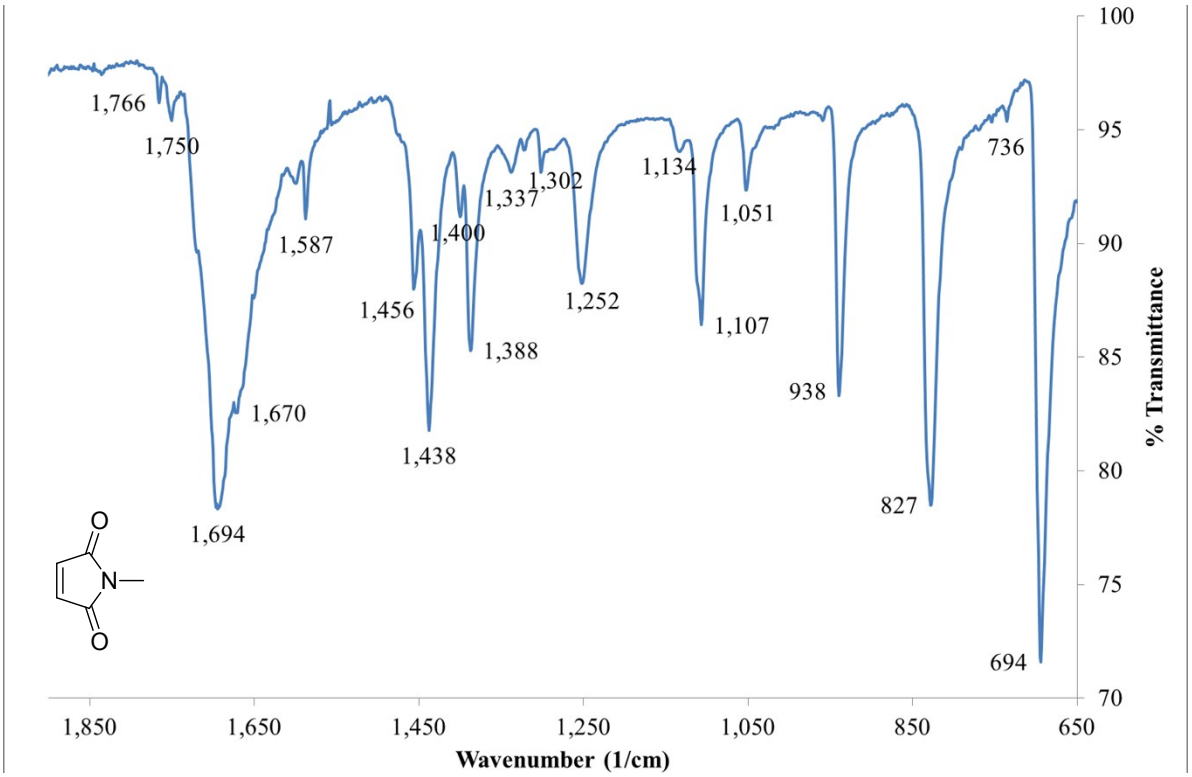

Fig. S1: An ATR-IR spectrum of the standard N-methylmaleimide from 1900-650 cm^{-1}.

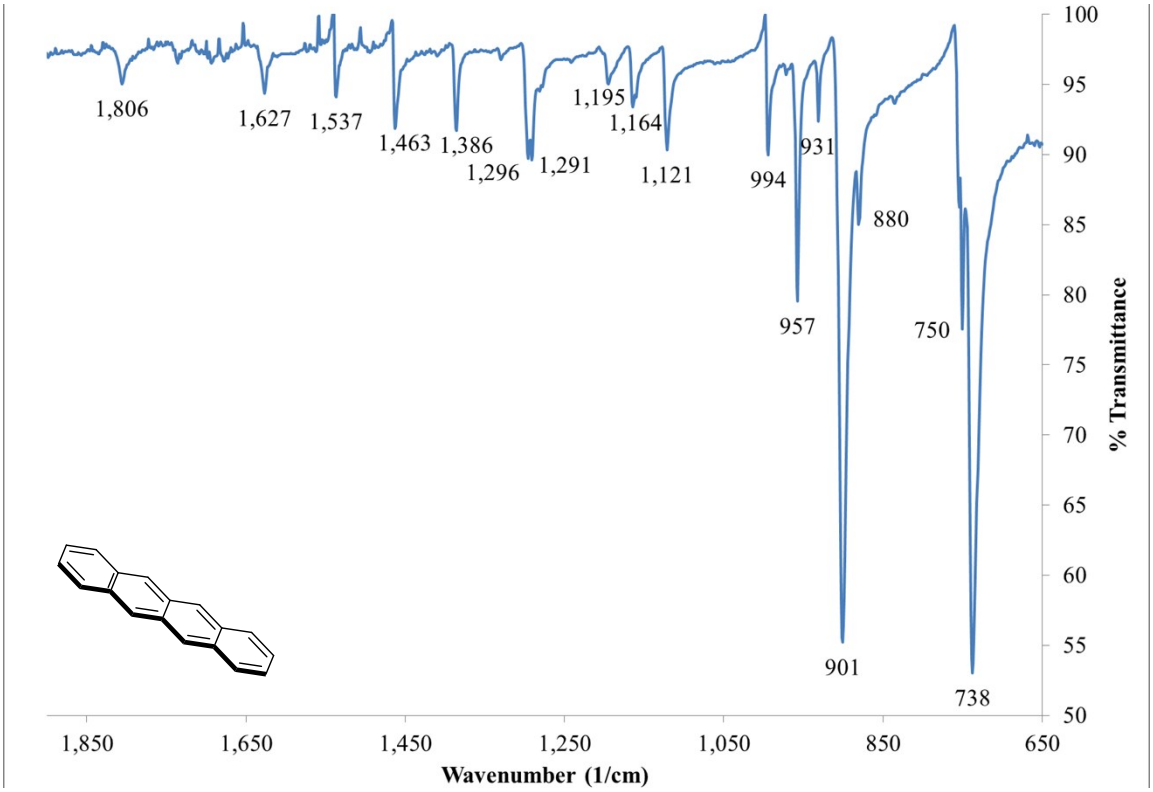

Fig. S2: An ATR-IR of standard tetracene from 1900-650 cm^{-1}.

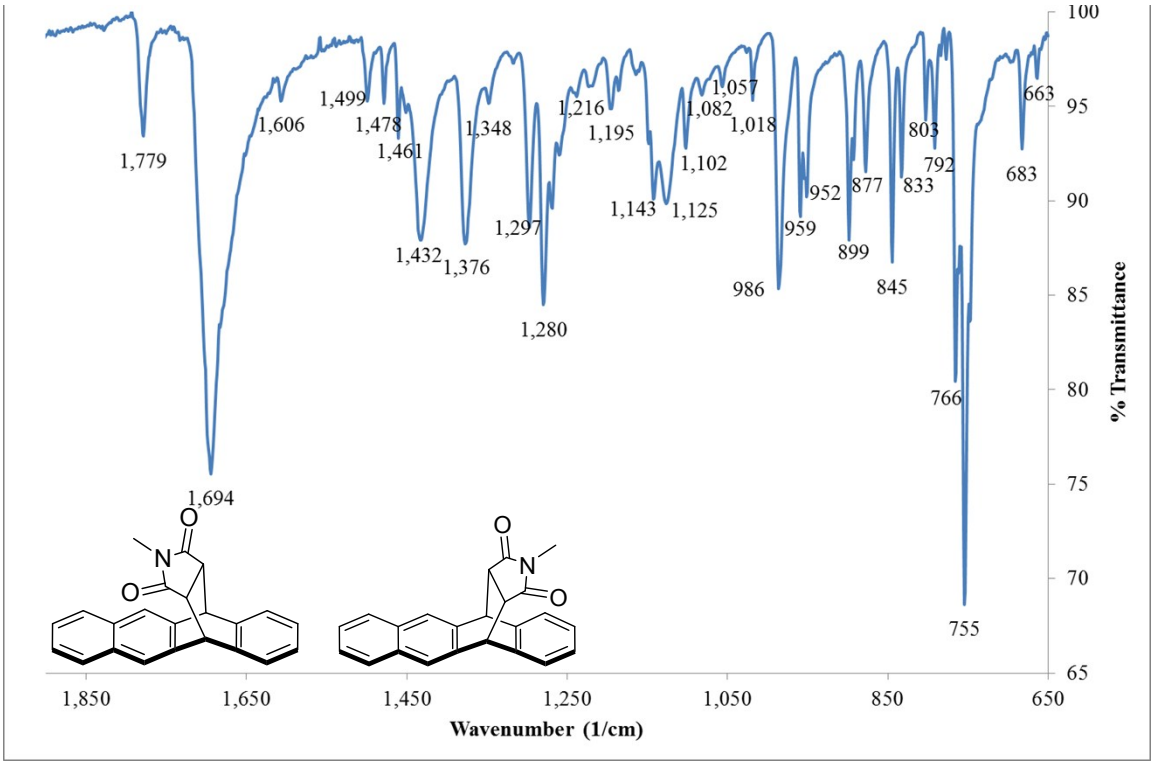

Fig. S3: An ATR-IR of the standard tetracene-N-methylmaleimide adduct from 1900-650 cm^{-1}.

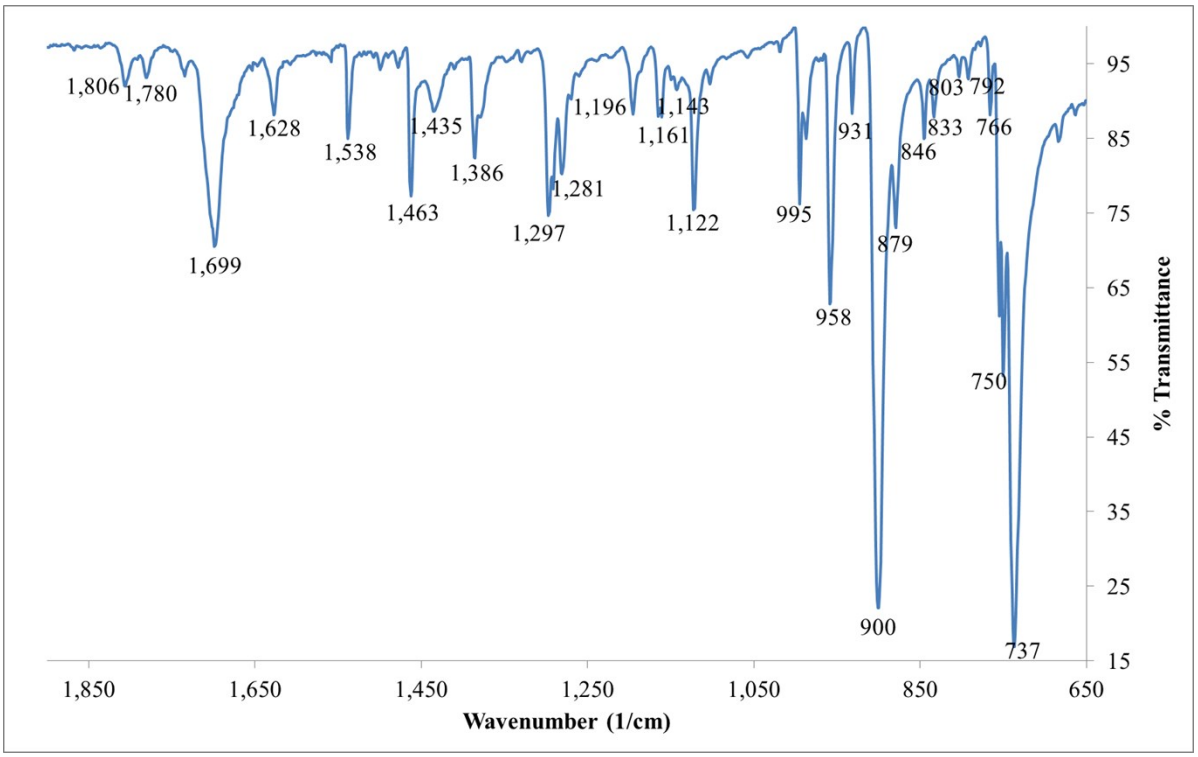

Fig. S4: An ATR-IR of a 10:1 mole ratio of tetracene to the standard tetracene-N-methylmaleimide adduct.

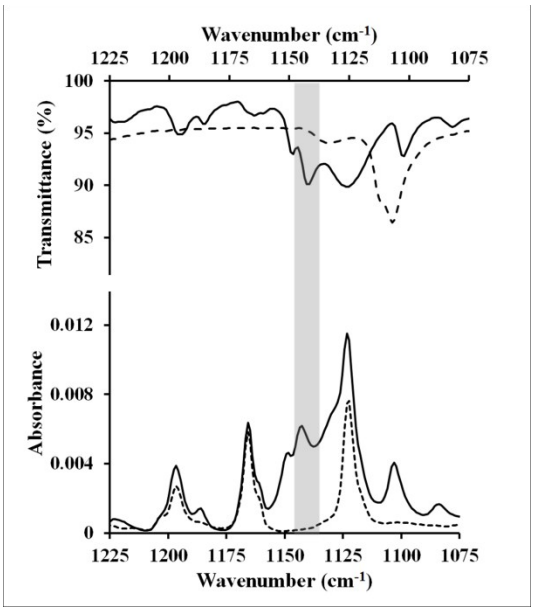

Fig. S5: A comparison of a PMIRRAS-IR spectrum of a film of tetracene that was exposed to N-*methylmaleimide (below) with the standard powder adduct taken via ATR-IR (above). The ATR-IR spectrum shows that* N-*methylmaleimide (dashed line) has little absorption above 1100 cm^{-1} allowing this region to be used for observing formation of the standard Diels- Alder adduct (solid line, above and below). The diagnostic peak at 1143 cm^{-1} is observed in the reacted substrate (solid line, bottom), and is not present in the pristine thin film (dashed line).*

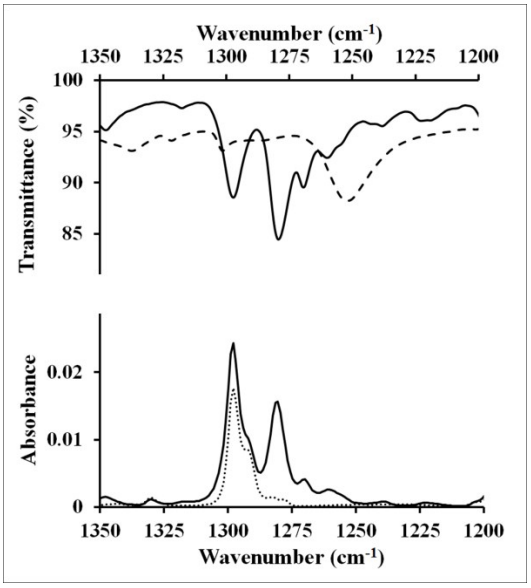

Fig. S6: A comparison of a PMIRRAS-IR spectrum of a film of tetracene that was exposed to N-*methylmaleimide (below) with the standard powder adduct taken via ATR-IR (above). The PMIRRAS-IR spectrum shows tetracene (dotted line) and the Diels-Alder adduct film (solid line) and the appearance of a peak at 1280 cm^{-1}. The ATR-IR spectrum displays* N-*methylmaleimide (dashed line) and the standard Diels-Alder adduct (solid line). The peak at 1280 cm^{-1} indicates formation of the Diels-Alder adduct.*

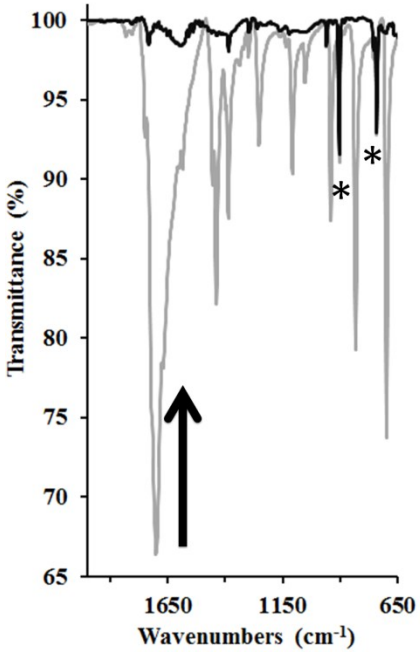

Fig. S7: Light gray line is a tetracene thin-film on a salt plate with N*-methylmaleimide sublimed on top. After 5 min exposure to a gentle stream of nitrogen (black line) the* N*-methylmaleimide features (e.g. 1705 cm^{-1}, arrow) disappear, leaving only vibrations from the tetracene thin film (starred).*

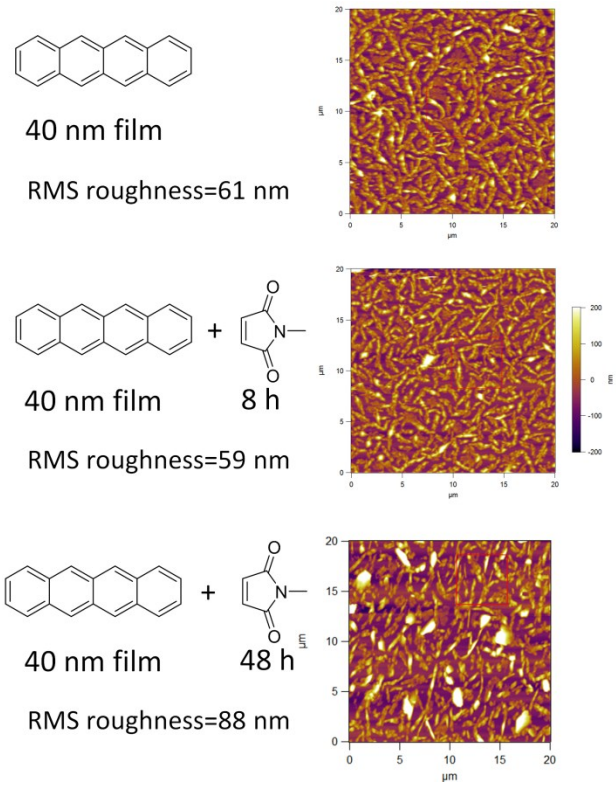

Fig. S8: AFM data of unreacted and reacted tetracene films. RMS data is for the scanned window.

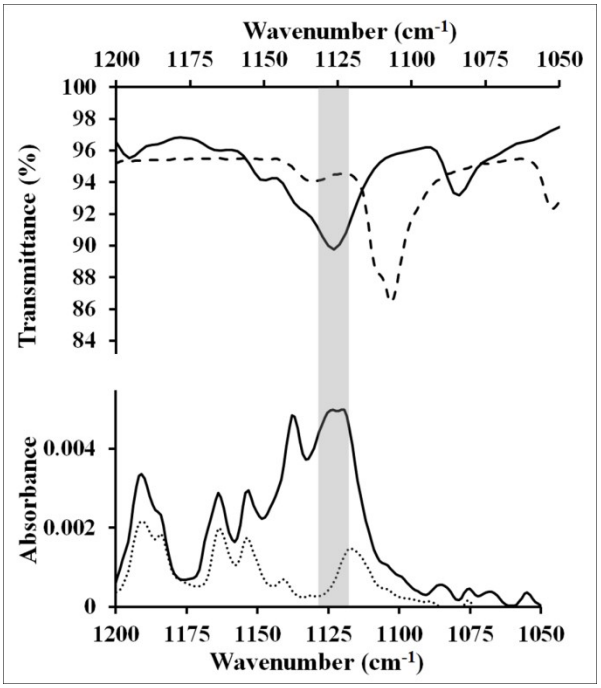

Fig. S9: A comparison of a PMIRRAS-IR spectrum of a film of pentacene that was exposed to N-*methylmaleimide (below) with the standard powder adduct taken via ATR-IR (above). The PMIRRAS-IR spectrum shows tetracene (dotted line) and the Diels-Alder adduct film (solid line) and the appearance of a peak at 1126 cm^{-1}. The ATR-IR spectrum displays* N-*methylmaleimide (dashed line) and the standard Diels-Alder adduct (solid line). The diagnostic peak at 1126 cm^{-1} indicates formation of the Diels-Alder adduct.*

Contact Angle Data

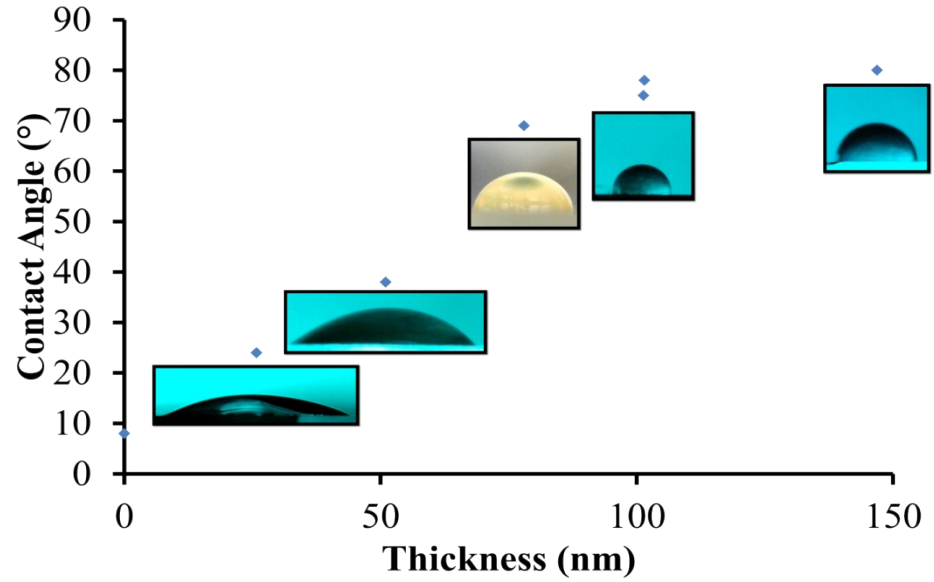

Fig. S10: A graph of contact angle (°) versus thickness (nm) of tetracene used to determine the baseline contact angle.

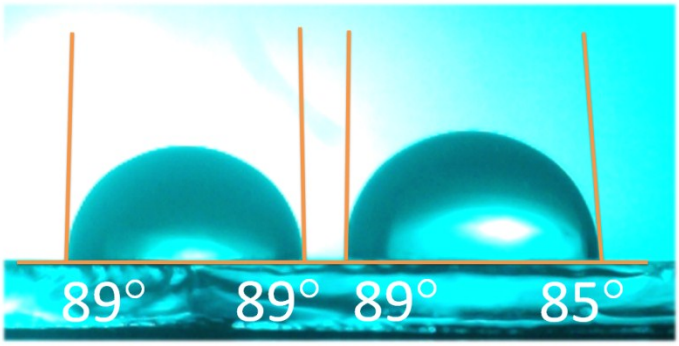

Fig. S11: Contact angle measurement on a 100 nm tetracene surface after exposure to water vapor for 48h.