Supporting Information

for

Low temperature fabrication of alkali metal-organic charge transfer complexes on cotton textile for optoelectronics and gas sensing

*Rajesh Ramanathan,[a] Sumeet Walia,[b] Ahmad Esmaielzadeh Kandjani,[a] Sivacarendran Balendran,[b] Mahsa Mohammadtaheri,[a] Suresh K. Bhargava,[a] Kourosh Kalantar-zadeh[b] and Vipul Bansal[a,]**

[a]*NanoBiotechnology Research Laboratory (NBRL), Centre for Advanced Materials and Industrial Chemistry, School of Applied Sciences, RMIT University, GPO Box 2476 V, Melbourne VIC 3000, Australia*

[b]*School of Electrical and Computer Engineering, RMIT University, GPO Box 2476 V, Melbourne VIC 3000, Australia*

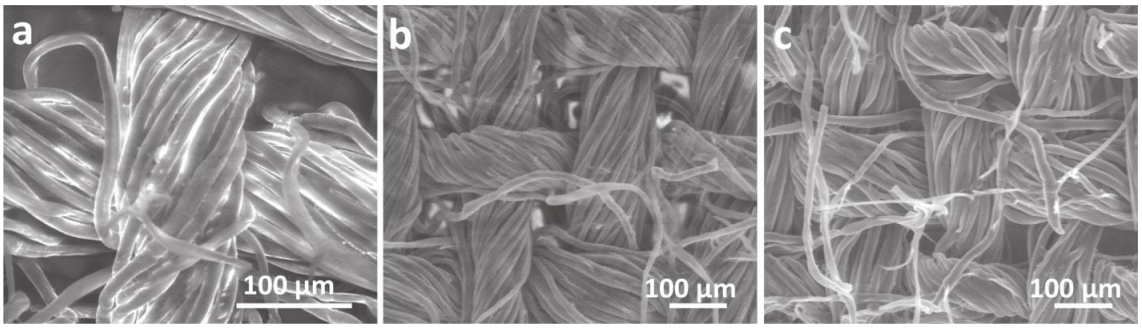

Figure S1. SEM images of (a) pristine textile after reaction with TCNQ, (b) textile after treatment with NaOH and (c) textile after treatment with LiOH.

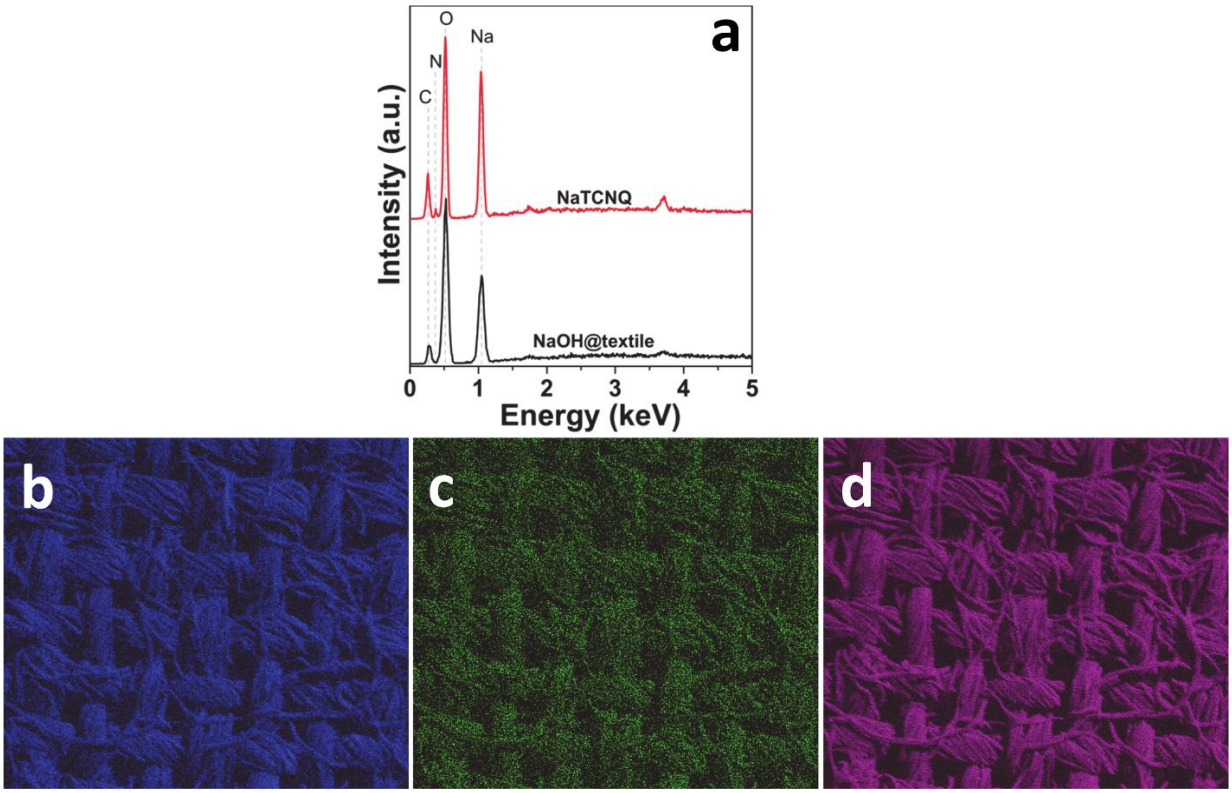

Figure S2. (a) EDX spectra from NaOH-treated textile and NaTCNQ textile, (b-d) EDX spectral maps of NaTCNQ textile showing C, N and Na (K shells), respectively.

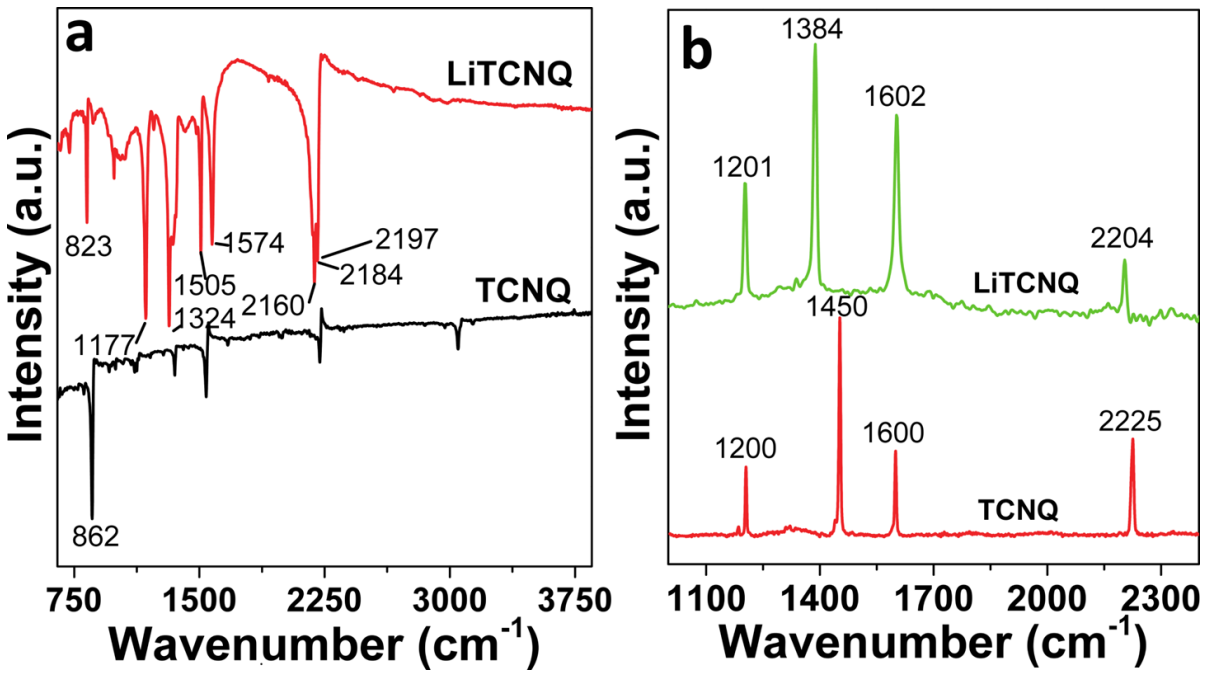

Figure S3. (a) FTIR and (b) Raman spectra obtained from pristine TCNQ and LiTCNQ textiles.

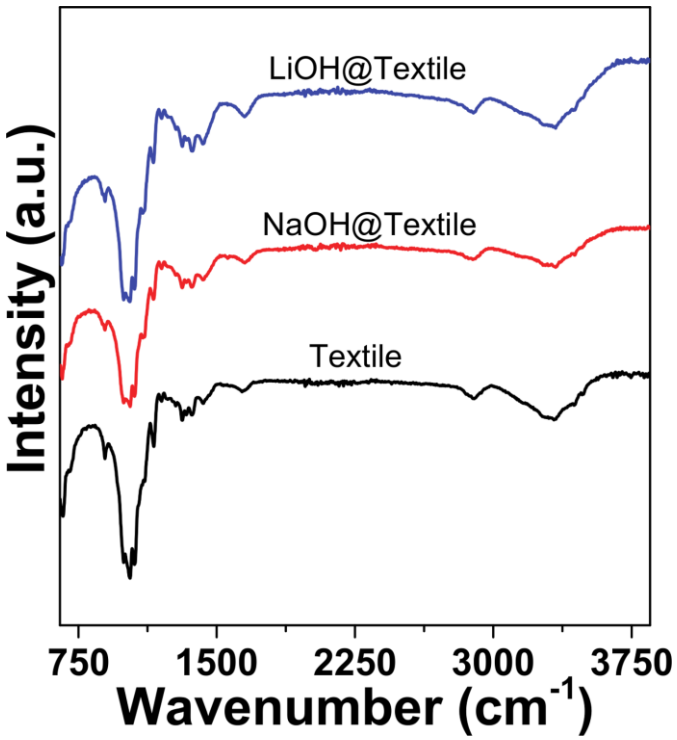

Figure S4. FTIR spectra of pristine untreated textile, NaOH-treated and LiOH-treated textile. The textile employed in the current study as a unique 3D template shows typical stretching vibrations arising from the cellulose component. These include the –OH stretching vibrations between 3600-3100 cm^{-1}, -CH stretching between 3000-2800 cm^{-1}, and bands at 1363, 1425 and 1640 cm^{-1} due to –OH, symmetric -CH and H-O-H bending modes, while the ring C-O stretching is observed at 1061 and 1032 cm^{-1}. The NaOH- and LiOH-treated textiles also show similar vibrations suggesting that there is no degradation of the cellulose components present in the cotton textile.

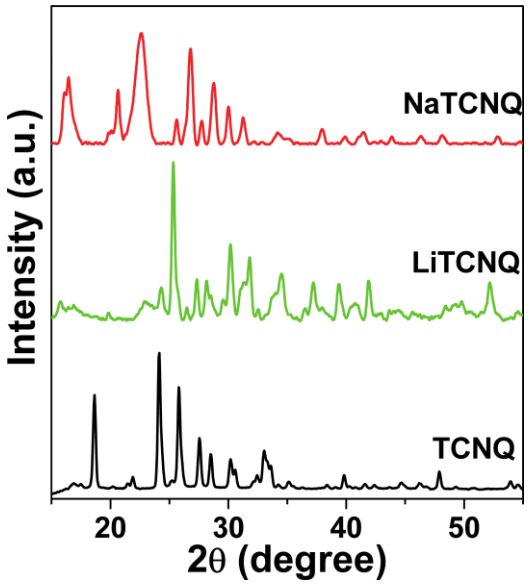

Figure S5. XRD patterns obtained from pristine TCNQ, LiTCNQ and NaTCNQ.

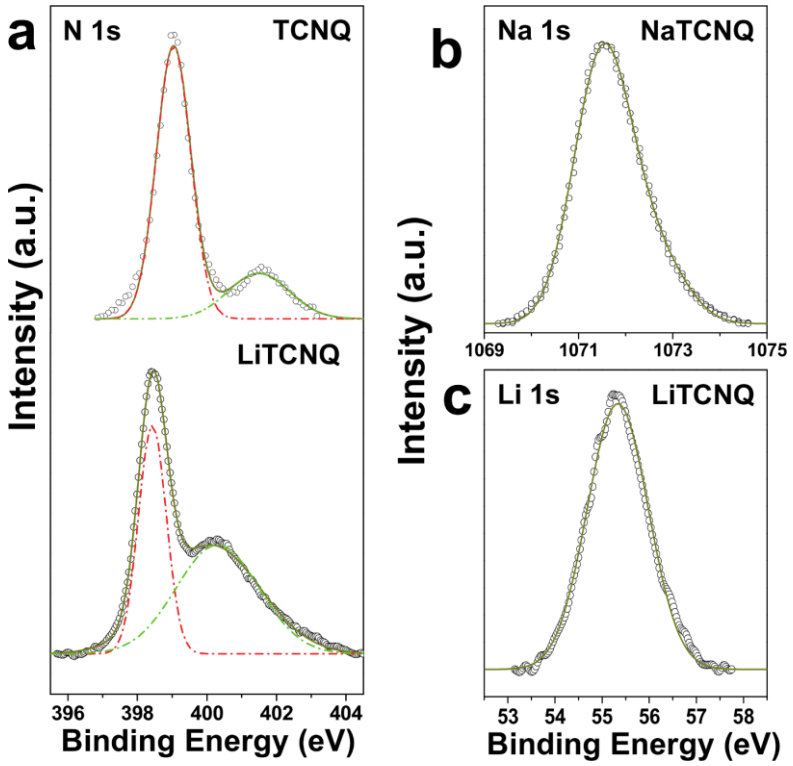

Figure S6. XPS analysis showing (a) N 1s core level spectra obtained from pristine TCNQ and LiTCNQ, (b) Na 1s core level spectrum from NaTCNQ and (c) Li 1s core level spectrum from LiTCNQ.

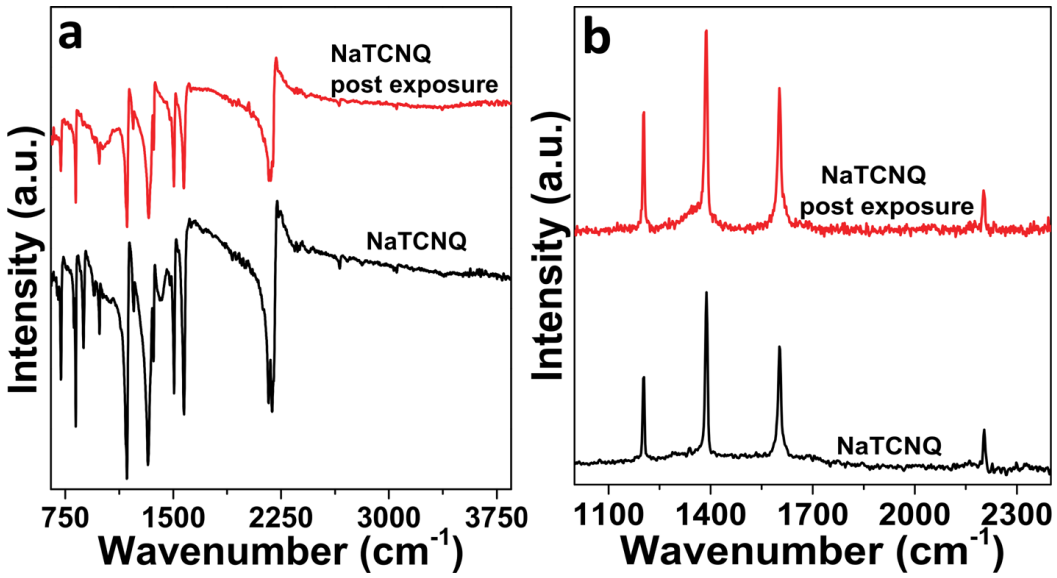

Figure S7. (a) FTIR and (b) Raman spectra of NaTCNQ textiles pre- and post-exposure to solar light.