Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Sustainable plasma polymer encapsulation materials for organic solar cells

Michael S. A. Kamel [ab], Michael Oelgemöller [c] and Mohan V. Jacob *[a]

[a] Electronic Materials Research Lab, College of Science and Engineering, James Cook University, Townsville 4811, Australia

[b] Physics Department, Faculty of Science, Minia University, P.O. Box 61519 Minia, Egypt

[c] Applied and Green Photochemistry Group, College of Science and Engineering, James Cook University, Townsville 4811, Australia

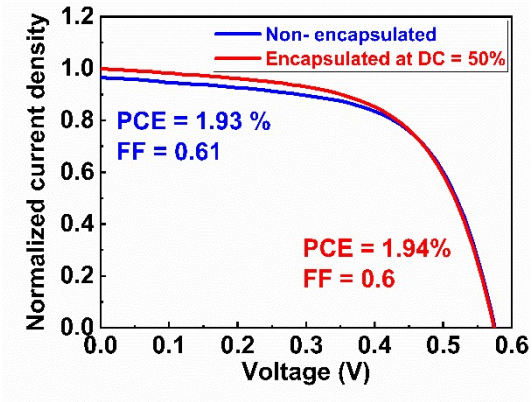


Fig. S1 J-V characteristics for the reference (non-encapsulated) and encapsulated device at 30 W RF pulsed plasma with DC = 50%. Both devices were fabricated under the same conditions. Device encapsulation was performed directly after fabrication. Data were collected just after fabrication and encapsulation, respectively. The low RF plasma used in this study did not cause any negative effect on the device performance.

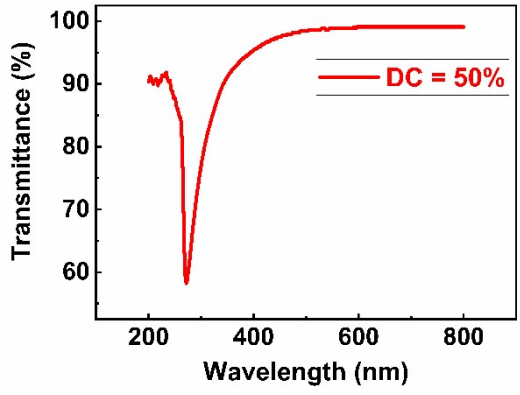


Fig. S2 Transmission spectrum, converted from UV-VIS data, of polymer thin film synthesized at 30 W RF pulsed plasma at duty cycle (DC) of 50%.

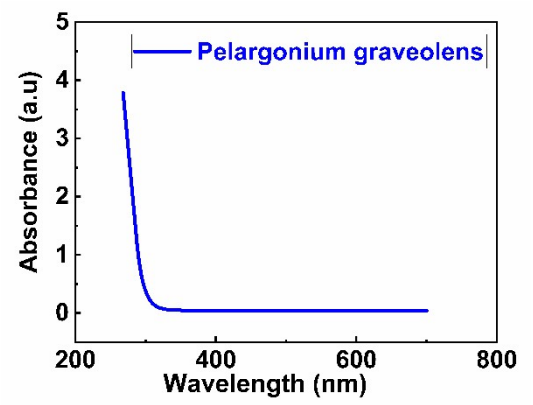


Fig. S3 UV-VIS spectrum of Pelargonium graveolens (Geranium oil) monomer. This measurement was performed using a diluted solution of the monomer (Pelargonium graveolens) in acetonitrile with concentration < 0.2 mg/ ml in quartz cuvette.

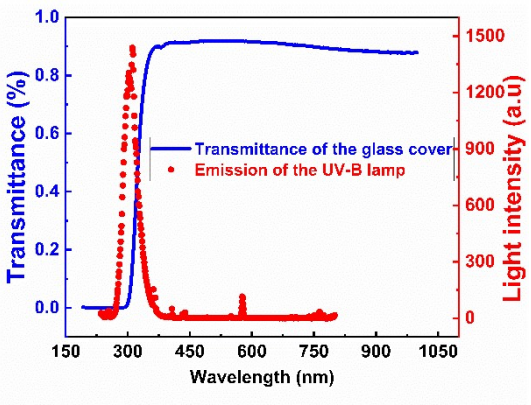
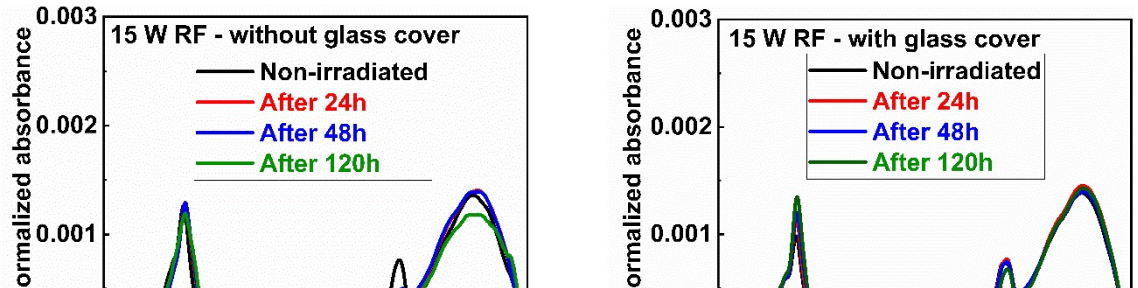


Fig. S4 Emission spectrum of the used UV-B source (red dots) & transmittance of the glass cover (blue line).



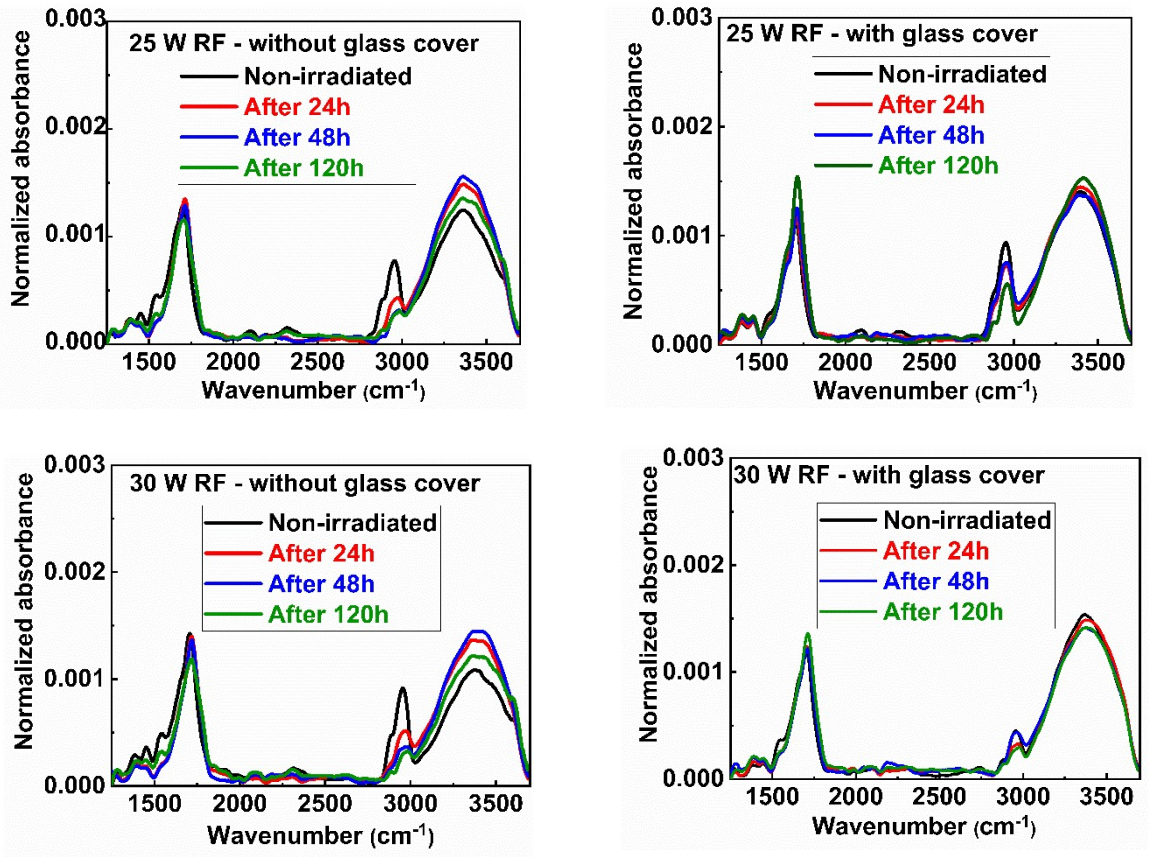
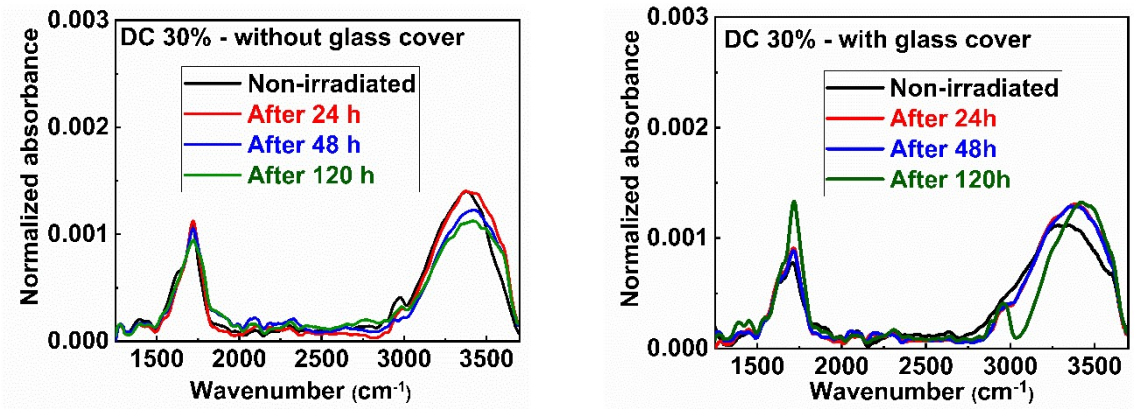


Fig. S5 The variation of FTIR spectra of the continuous plasma-based polymer thin films with UV-B irradiation without (left) and with (right) glass cover for variable irradiation time.



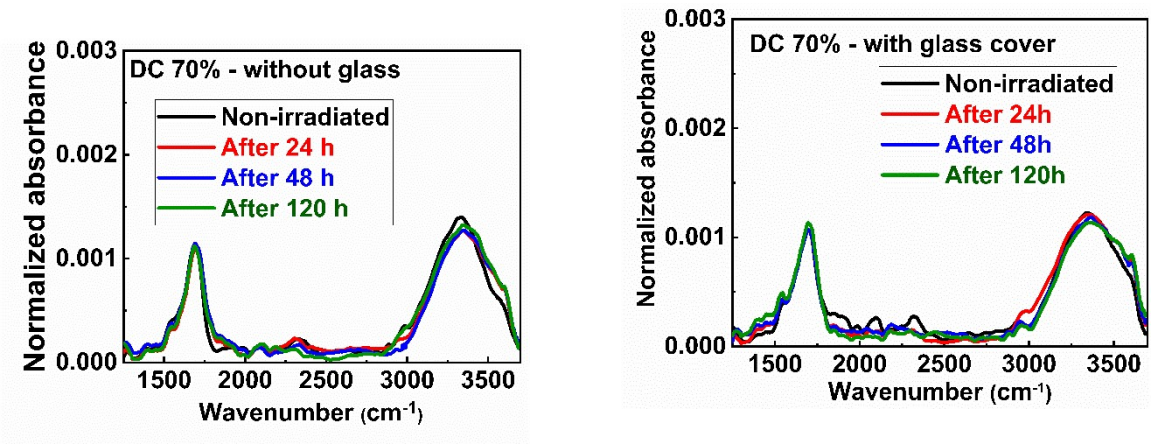


Fig. S6 The variation of FTIR spectra of the pulsed plasma-based polymer thin films with UV-B irradiation without (left) and with (right) glass cover for variable irradiation time.