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

The effect of thermally induced chemical transformations on the structure and properties of carbon fibre precursors

Srinivas Nunna[a], Claudia Creighton[a], Bronwyn L. Fox[b], Minoo Naebe[a], Maxime Maghe[a], Mark J. Tobin[c], Keith Bambery[c], Jitraporn Vongsvivut[c], Nishar Hameed[b*]

[a] *Carbon Nexus, Institute for Frontier Materials, Deakin University, Pigdons Road, Waurn Ponds, Victoria 3217, Australia.*
[b] *Factory of the Future, Swinburne University of Technology, Hawthorn, Victoria 3122, Australia.*
[c] *Infrared Micro Spectroscopy Beamline, Australian Synchrotron, 800 Blackburn Road, Clayton, Victoria 3168, Australia.*
** Corresponding Author email: nisharhameed@swin.edu.au*

S.1. Scanning Electron Microscopy (SEM)

Zeiss Supra 55VP FEG scanning electron microscopy was used to perform analysis on the cross-sections of the fractured fibre samples. The samples were initially mounted vertically on a stub and coated with AU before performing SEM imaging at an operating voltage of 3 kV.

S.2. Facture Morphology

The cross-sections of the fractured samples are shown in Figure S.1. In both the samples a rough texture and a granular facture is observed. No skin-core differences in the morphology is visible. This could be attributed to the treatment temperature and time used in this study might not be sufficient enough to generate the clear difference between the skin and the core fracture behaviour. This observation is consistent with our previous studies [1] where the clear differences in the skin and the core of fibres were observed only at extreme processing conditions (at 300 °C and 24 mins).

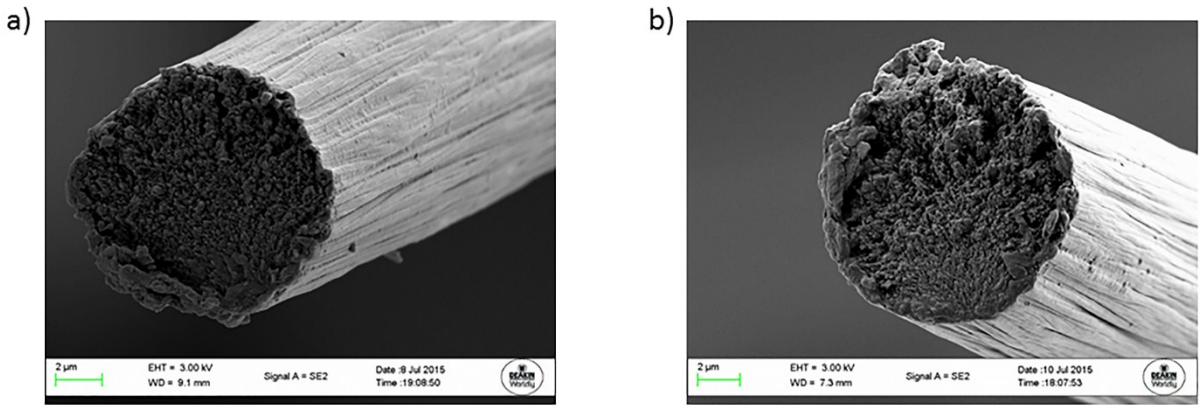

Fig S.1. Fracture morphology of the samples treated at 240 °C a) 12 min b) 24 min.

S.3. References

[1] S. Nunna, C. Creighton, N. Hameed, M. Naebe, L.C. Henderson, M. Setty, B.L. Fox, Radial structure and property relationship in the thermal stabilization of PAN precursor fibres, Polymer Testing 59 (2017) 203-211.