Electronic Supplementary Material (ESI) for RSC Advances.

A bio-friendly green route to processable, biocompatible graphene/polymer composites.

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Supporting information

The following document presents further work and clarification of the synthesis and analysis of graphene/polycaprolactone composites formed by simultaneous reduction and polymerisation under microwave irradiation.

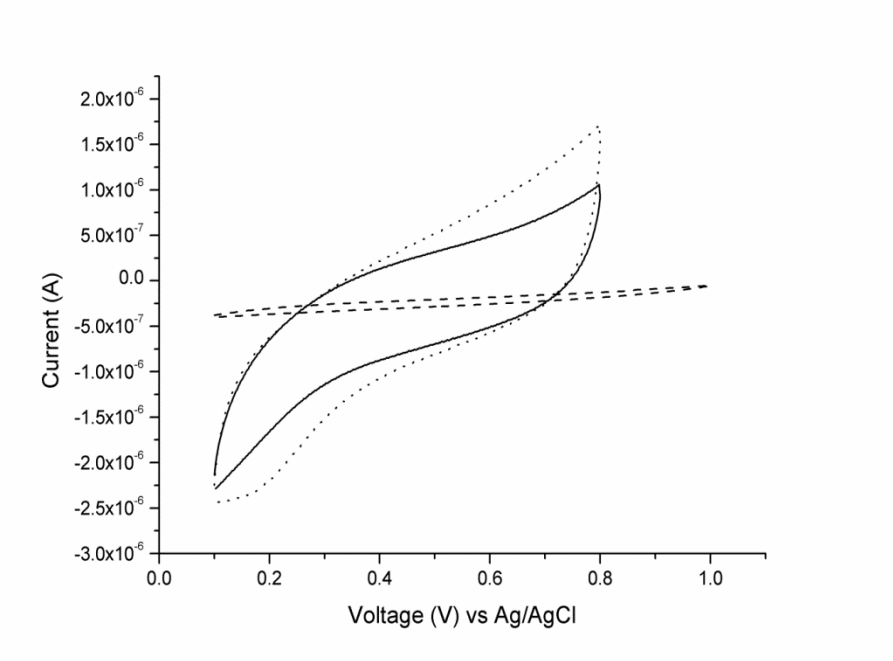

Fig. S1 Cyclic voltammograms of pure PCl (dashed line), 1% PCl-rGO (solid line) and PCl-CCG (dotted line).

Cyclic voltammetry (figure S1) showed a large increase in capacitance on the addition of graphene or graphene oxide. The microwave reduced 1% PCl-rGO sample showed only slightly less increase in capacitance over the pristine polymer then the 1% PCl-CCG material indicating good conversion of the insulating graphene oxide nanosheets to highly conducting reduced graphene within the polymer matrix.

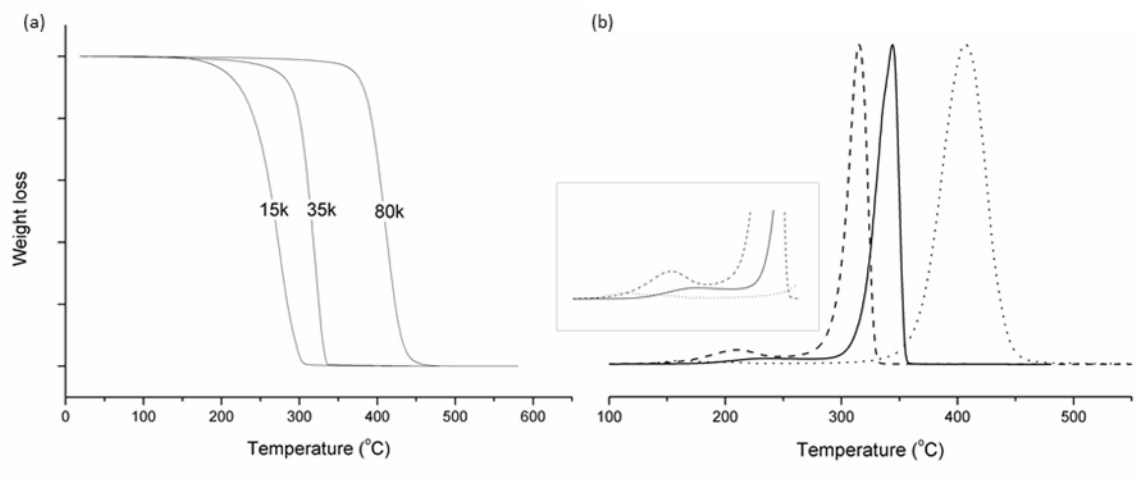

Fig. S2 (a) Thermogravimetric curves of pristine caprolactone with average molecular weights of 15000, 35000 and 80000 showing the change in degradation temperature with respect to chain length in polycaprolactone. (b) Derivatives of TGA curves featured in Figure 5a showing the two distinct thermal events for the microwave reduced samples 0.1% PCl-rGO (---) 1% PCl-rGO (—) and the single thermal event for blended 1% PCl-CCG (•••) with 80,000 MW polycaprolactone.

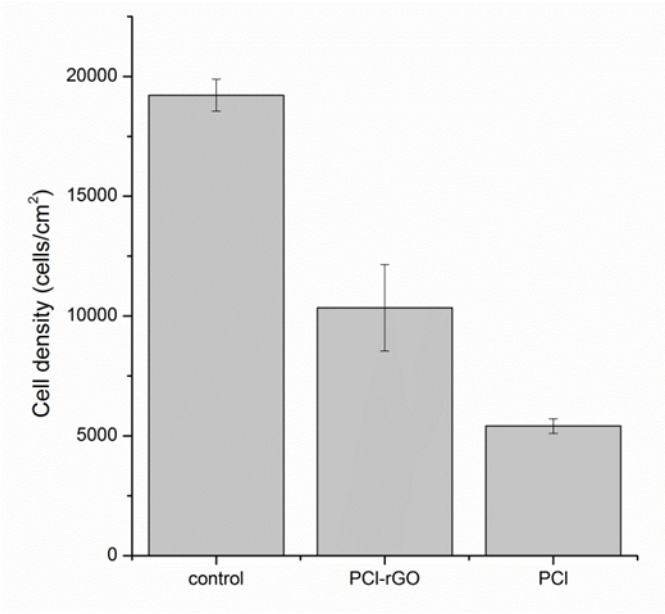

Fig. S3 Cell density of L929 fibroblasts after 4 days of growth on several surfaces. Cell density increased from a seeding density of 1500 cells/cm^2 on tissue culture-treated polystyrene (control), and on unmodified PCl and PCl-CCG films.

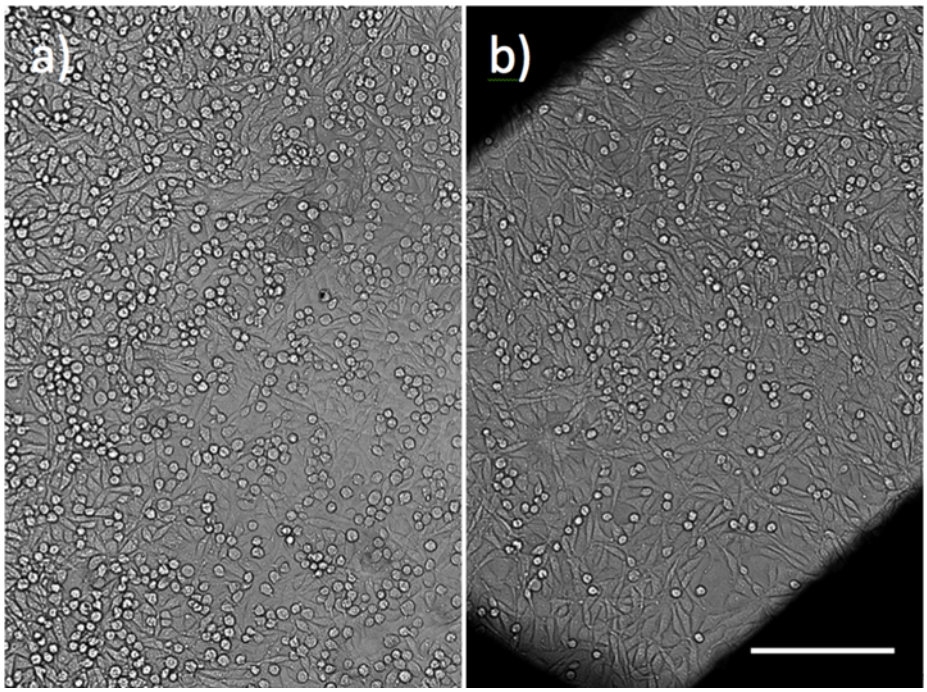

Fig. S4 L-929 cells growing on a) tissue culture plastic control and b) on tissue culture plastic underneath the 1% PCl-rGO scaffold after 4 days of culture, demonstrating that the presence of the scaffold in the media did not change the density or morphology of L-929 cells by leaching of any soluble compounds.