

Aligned carbon composites and their anisotropic electromechanical properties

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We have recently demonstrated how to use an alternating electric field (dielectrophoresis) when aligning carbon particles into single wirelike strings. When the particles are immersed in a monomer mixture the strings can be stabilized by UV-curing the matrix [1]. These strings show anisotropic electrical and electromechanical properties. Furthermore, stretching of strings leads to a reversible change in resistivity —piezoresistive behavior— and a gauge factor of about 150 [2].

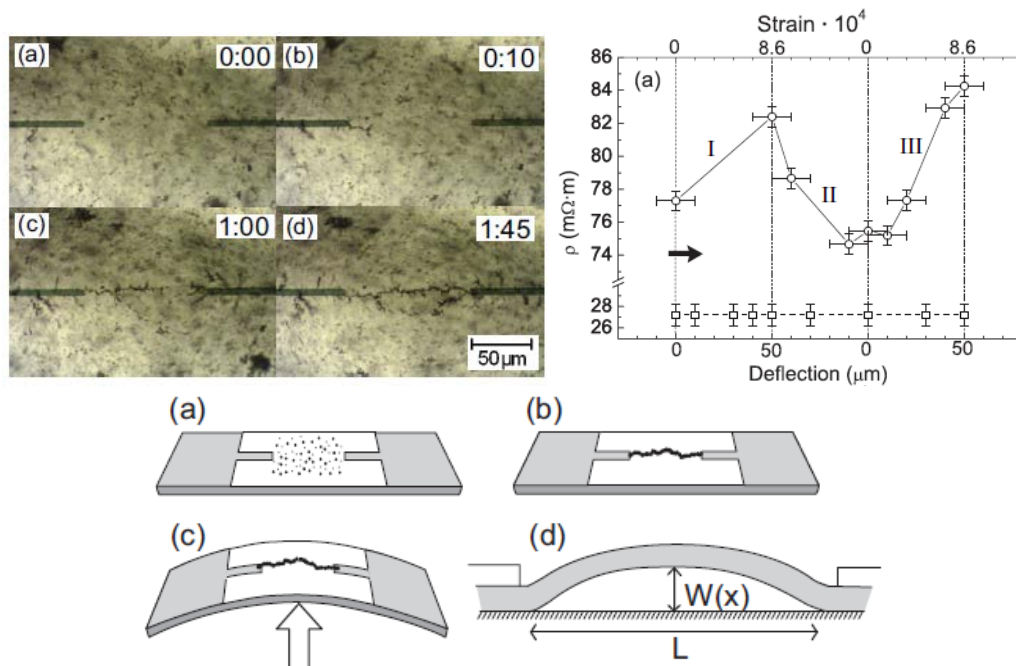


Figure 1: Left: Alignment of carbon particles by an alternating electric field between tip-like electrodes. Right: Resistivity of a particle string as a function of deflection. Below: Illustration of alignment and deflection. Adapted from Ref. [2].

References

- [1] M. Knaapila, H. Høyer, and G. Helgesen, *Eur. Phys. J. Special Topics* **223**, 1869 (2014).
- [2] H. Høyer, M. Knaapila, J. Kjelstrup-Hansen, X. Liu, and G. Helgesen, *Appl. Phys. Lett.* **99**, 213106 (2011).

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