

Thin films from carbon nanotubes of highly tuned structure and properties

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Due to remarkable electrical, thermal, optical and other properties of carbon nanotubes they have attracted significant interest from research groups all over the world. However, to implement them in the real life, we still need better methods to control their structure at the nanoscale and also techniques to turn these highly defined materials into macroscopic ensembles. In this contribution, I will present results of our work how we have attempted to solve these problems. I will share our recent advances on the front of sorting CNTs by electrical character and chirality [1,2]. I will also show a method developed by us, which enables formation of free-standing thin films from any type of CNTs including that of monochiral nature [3,4]. The obtained materials are very promising for a wide range of electrical and optical applications.

[1] D. Janas, E. Turek, T. Wasiak, G. Stando, Carbon (submitted).

[2] D. Janas, E. Turek, T. Shiraki, Nat. Nanotechnol. (submitted)

[3] D. Janas, M. Rdest, K. Koziol, Mat. & Des. **121**, 119-125 (2017)

[4] D. Janas, G. Stando, Sci. Rep. **7**, 12274 (2017)