Thesis Message
Carbon nano-wires synthesis through electrospun-able, photopolymerizable and pyrolyzable/graphitizable fibers

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1. Carbon fibers are versatile materials composed of carbon chains with a wide range of applications.
2. Carbon nanowires have been fabricated with a photoresist, but little is known about polymers that can produce more conductive carbon nanowires after pyrolysis.
3. FFES or Far field electrospinning is a inexpensive process to produce polymer fibers, but with low accuracy due to electric instabilities.
4. Near field electrospinning (NFES) is similar to FFES, but with a reduced distance between the fiber source and the collector and higher precision.
5. Various polymer solutions have being tested and measured through NFSE and photopolymerization processes; it was found that it is not possible to predict the behaviour of the electrospinning process, so additional properties are to be considered to achieve a stable process.
6. The properties of the polymer solution can be amended to obtain a electrospun-able, photopolymerizable and pyrolyzable/graphitizable fibers.
7. Analyse the rheology of different polymer solutions to determine if they can be easily electrospun at low voltages and then fabricate nanowires with them.
8. Design polymer solutions that can be electrospun by NFES, photopolymerized, and then pyrolyzed into conducting carbon nanowires.
9. The use of the newly designed polymer solution within the NFES-Photopolymerization-Pyrolysis process can be amended to achieve mass scale manufacturing of carbon nanowires in a cheap, continuous, simple and reproducible manner.
10. The new/tailored polymer solution can be used to synthesize carbon nanowires with high conductive properties and reduced thickness.