Enhancing modulus and conductivity of PAN based electrospun carbon nanofiber by pitch content

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PAN (polyacrylonitrile) based carbon fiber has high tensile strength but lower modulus than the pitch based carbon fiber. Especially, for electrospun carbon nanofiber, the obtained nanofiber usually lacks ordered carbon structure. In this case, we integrate the PAN and pitch together to compromise the property of the pyrolyzed carbon nanofiber. Infrared spectroscopy analysis shows the weak interaction between PAN and pitch content. By using petroleum pitch A240, we increased the modulus of PAN based carbon nanofiber for more than 20%. The electrical conductivity was also increased by 600%. With a comprehensive analysis, we identified that the structure of pitch/PAN based carbon nanofiber is more ordered compare to the pristine one.