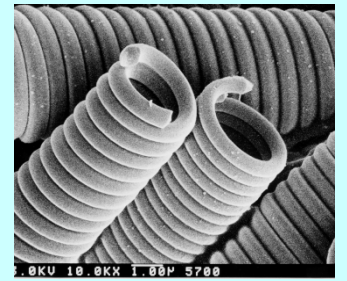
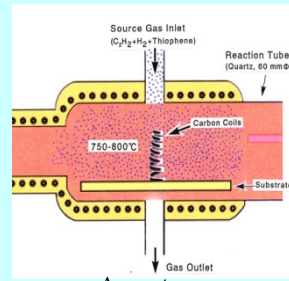


Morphology of Carbon Nanocoils Prepared by the Catalytic Pyrolysis of Acetylene

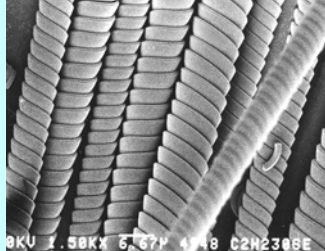
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(Abstract) Carbon nanocoils with a 3D-helical/spiral structure and a coil diameter of several hundred to several ten nanometers were prepared by the catalyzed pyrolysis of acetylene using the Ni-based catalysts. The Morphology of the carbon nanocoils were examined in detail and the growth mechanism was discussed. The carbon nanocoils were generally a single coil with twisted form while carbon microcoils were double coils. The vapor grown carbon fibers successively curls or twists to form coiling pattern and form carbon coils based on the anisotropic deposition mechanism.



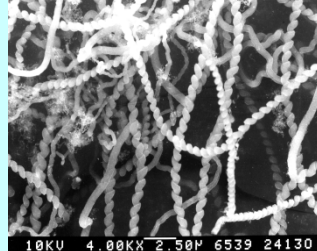
Representative carbon microcoils



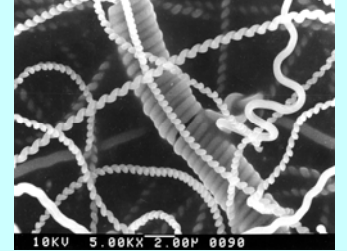
Regular carbon microcoils



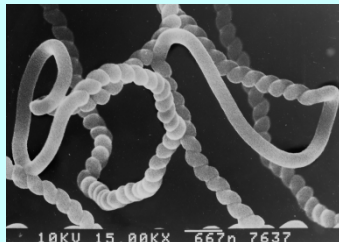
Single carbon coils



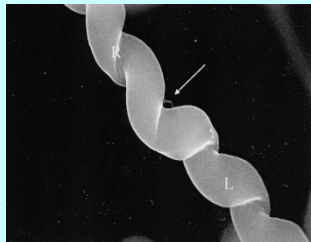
Carbon nanocoils



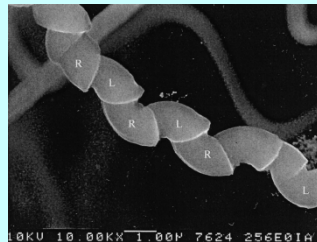
Carbon nanocoils



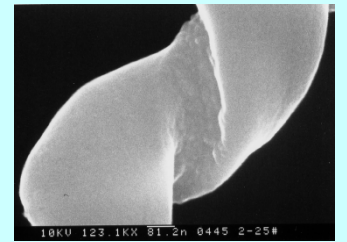
Straight fiber-coil



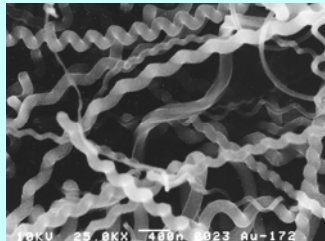
Changing coiling-chirality



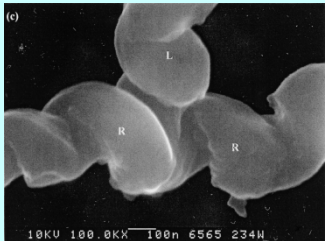
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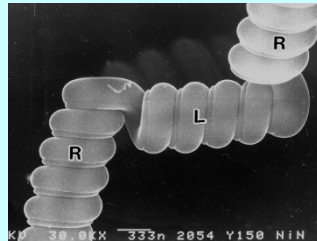
Enlarged view of twisted coil



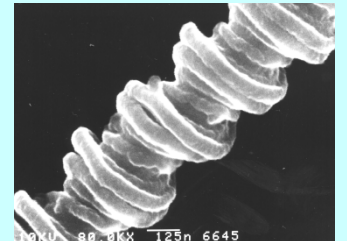
Carbon nanocoils with different coil diameter and coil pitch



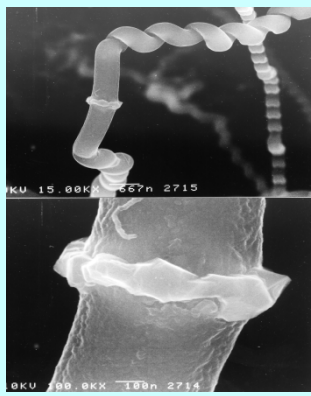
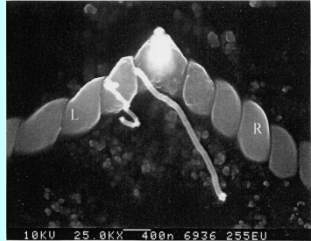
Changing coiling-chirality



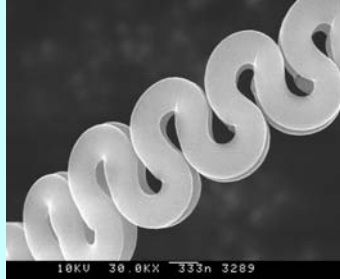
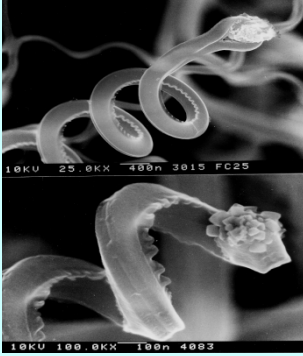
Changing coiling-chirality



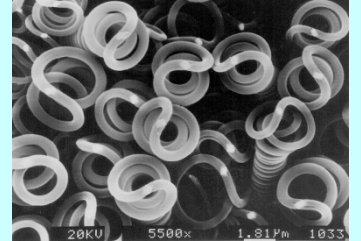
Multiple coils



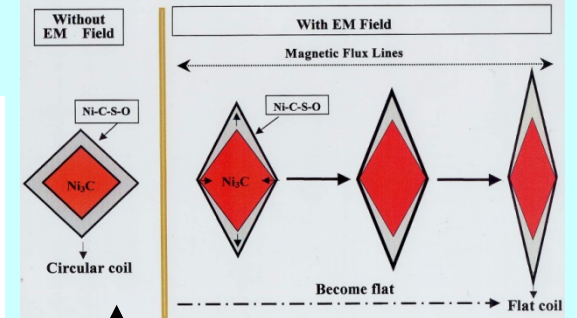
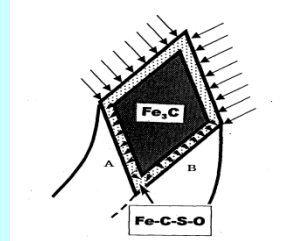
Tip of the carbon nanocoils



Zigzag carbon fiber



Initial growth pattern



Growth model of carbon coil