Nanocarbon Materials: Science and Applications

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After describing the discovery of carbon nanotubes (CNT) with emphasis on importance of high-resolution electron microscopy (HRTEM) [1], basic structures, properties and applications of CNT will be presented. Its unique cylindrical form and nano-meter-sized structure have brought a new concept into condensed matter physics and materials science. Synthesis, purification and modification of CNT are common subjects in terms of industrial applications. Excellent thermal conductance and tensile strength of CNT attract some researchers working on charge stripper in heavy ion accelerators. Some effort along that direction will be discussed. Modern electron optical technology including high resolution microscopy, electron energy loss spectroscopy (EELS) [2] and energy dispersive X-ray analysis (EDX) [3] has progressed greatly and supported widely innovative research on nano-materials. Some of recent examples of atomic- detailed characterizations of nanocarbon materials, CNTs, graphene sheets and related nano-materials will be presented.

1) S. Iijima, Nature, 345, 56(1991).
2) K. Suenaga et al., Nature, 468, 1088(2010).
3) K. Suenaga, et al., Nature Photonics, 6, 503(2012).