

Generation of SWNTs by Laser Oven Technique

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Since the discovery of single walled carbon nanotubes (SWNTs), they have attracted great interest from the viewpoints of both fundamental physics and potential applications, such as field emissions and hydrogen storage. For more efficient and controlled production of SWNTs, it is necessary to understand the formation mechanism. We have implemented the laser-oven apparatus shown in Fig.1. Pulsed Nd:YAG laser was mildly focused to the metal-loaded graphite rod (Ni/Co 0.6/0.6 at. %) located in a furnace (temperature at 1100°C) in argon gas flow about 0.84 cm/s at typical pressure of 600 Torr. Examples of TEM image in Fig. 2 and Raman spectra in Fig. 3 and Fig. 4 are consistent with typical SWNTs about 1.2 nm in diameter.

Various effects of laser vaporization conditions on SWNT production will be discussed.

We thank professor H. Kataura at Tokyo Metropolitan University for measurements of Raman spectra.

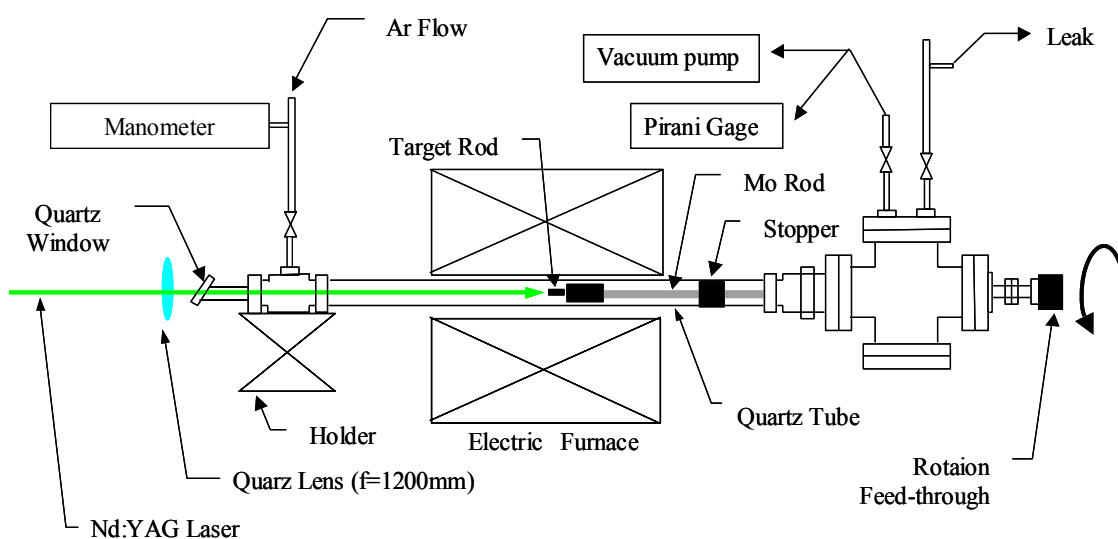


Fig. 1 Laser-oven SWNT generator

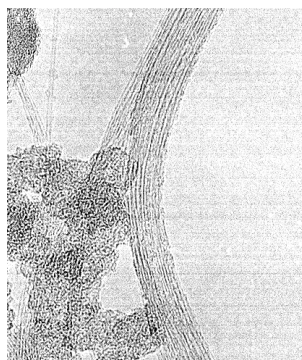


Fig. 2 TEM image

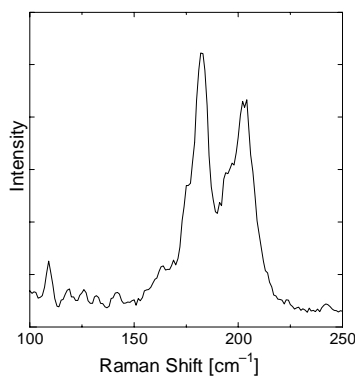


Fig. 3 Radial breathing mode

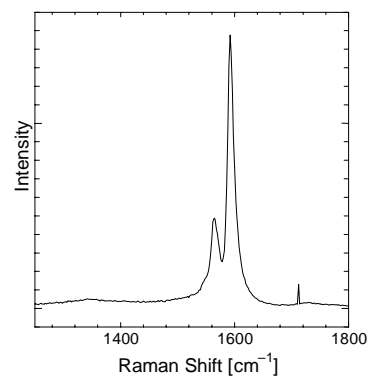


Fig. 4 Tangential mode