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Production of Fullerenes and Carbon Nanotubes by the Hot-Filament Assisted CVD Method

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We report a simplified production method for fullerenes and carbon nanotubes by the hot-filament assisted chemical vapor deposition (HFCVD) method. Bulk production of single-walled carbon nanotubes (SWNTs) is achieved by using pure alcohol vapor (ethanol, methanol and 2-propanol) as a carbon source. Figure 1 shows a SEM image of the pristine SWNTs from ethanol. Web-like structures of bundles of SWNTs were observed on the zeolite support particles around 400-500 nm. It is difficult to observe other prominent structures, indicating the high purity of the sample. Raman spectra of the synthesized SWNTs show similar features to those obtained by the CCVD method with an electric furnace [1-3]. The advantage of the present technique is that the efficiency of the SWNTs production is increased by the hot-filament-induced pyrolysis of carbon sources, which enables us to easy scale-up the production rate at a low cost. Furthermore, the mass production of fullerenes and metallofullerenes by the method will be also discussed in the meeting.

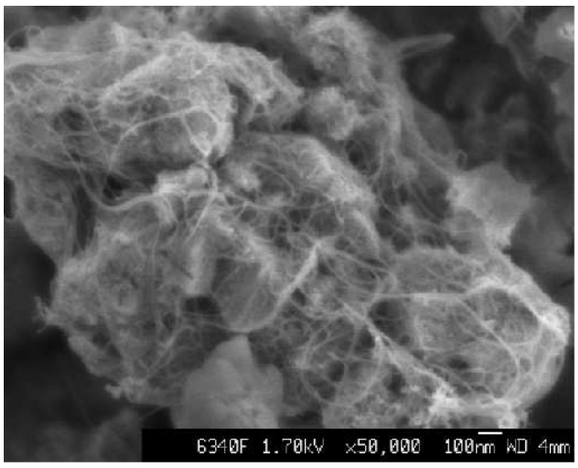

Fig. 1. SEM image of the pristine material from ethanol at 25 Torr.

References

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