

Electron beam at low acceleration voltage does not damage single walled carbon nanotubes

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According to the previous research single walled carbon nanotubes (SWNTs) can be damaged by low-voltage (1 keV) e-beam. In our study we present experimental results that suggest that the information described above that has been widely accepted by many researchers in the field could actually be misleading. First, although low-voltage e-beam is irradiated to the SWNTs in ultra-high vacuum, carbon contamination is made on SWNTs and it is important factor which was not considered by previous research. Second, we also show disappearing D-peak of irradiated SWNTs without high temperature process which means SWNTs irradiated by low-voltage e-beam is not damaged. To do this experiment, we choose the PMMA to eliminate increased D-peaks. The increased D-peaks can be easily eliminated by doing that only irradiated SWNTs is coated by PMMA film and removed by acetone. We conclude that the D-peaks come from hydrocarbon deposition rather than the damage to the SWNTs.