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Purification of Carbon Nanotubes by Proton Irradiation EUIK-WOUN KIM, JEONGGIL LEE, YOUNMAN LEE, JAEKYUN JEON, JAE-YONG KIM, Department of Physic, Hanyang University, Seoul, Koera, JEONGHA KIM, KWANWOO SHIN, Department of Chemistry, Sogang University, Seoul, Korea, SANG-PIL YOUN, KYERYUNG KIM, Division of Proton Engineering Frontier Project, Korea Atomic Energy Research Institute, Daejeon, Korea — Carbon nanotubes (CNTs) exhibit variety of superior physical properties including well-defined nanodimensional structure, high electrical and thermal conductivity, and good mechanical stability against external irradiations. Further, a large specific surface area per unit weight suggests that carbon nanotubes could be excellent candidates for gas storage, purification, and separation. However, the practical application of CNTs is limited mainly due to the metallic impurities that were used as a catalyst during the fabrication process. Here, we irradiated CNTs by using high energy proton beams (35.7 MeV at the Bragg Peak). Interestingly, metallic impurities such as Fe, Ni, Co and chunk of amorphous carbon that were attached on the surface of CNTs were completely removed after the irradiation. The mechanism of such the purification process is not understood. The possible speculation will be demonstrated combined with the changes of physical properties including the appearance of the magnetism after the irradiation.

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