Abstract Submitted for the MAR05 Meeting of The American Physical Society

Oxidative Process for Cutting Single-Walled Carbon Nanotubes JONAH SHAVER, KIRK ZIEGLER, ZHENNING GU, ZHEYI CHEN, ERICA FLOR, CANDACE CHAN, ROBERT HAUGE, RICHARD SMALLEY, Rice University Carbon Nanotechnology Laboratory (CNL) — Cut single-walled carbon nanotubes (SWNTs) are needed for many applications. An efficient way to produce bulk amounts of cut SWNTs is a two step process consisting of sidewall damage and oxidative exploitation. In these experiments sidewall damage is introduced by ozonation in a perfluoropolyether (PFPE) while monitoring the degree of functionalization with in-situ Raman spectroscopy. Use of PFPE allows for a high degree of sidewall functionalization at room temperature, mainly in the form of epoxides. These damaged SWNTs are exposed to piranha (4:1 96samples are then functionalized with alkyl groups and spin cast on mica for length analysis. The cut samples are found to have significantly shorter lengths while maintaining a relatively high carbon yield.

Jonah Shaver

Date submitted: 01 Dec 2004

Electronic form version 1.4