Supplementary Material (ESI) for Chemical Communications

Alignment-retainable nitrogenation of cylindrical carbon nanotubes by thermal reaction with ammonia following UV oxidation: chemical alteration effects on electrical conductivity

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Supplementary Information

1. TEM images of pristine CNTs and NCNTs

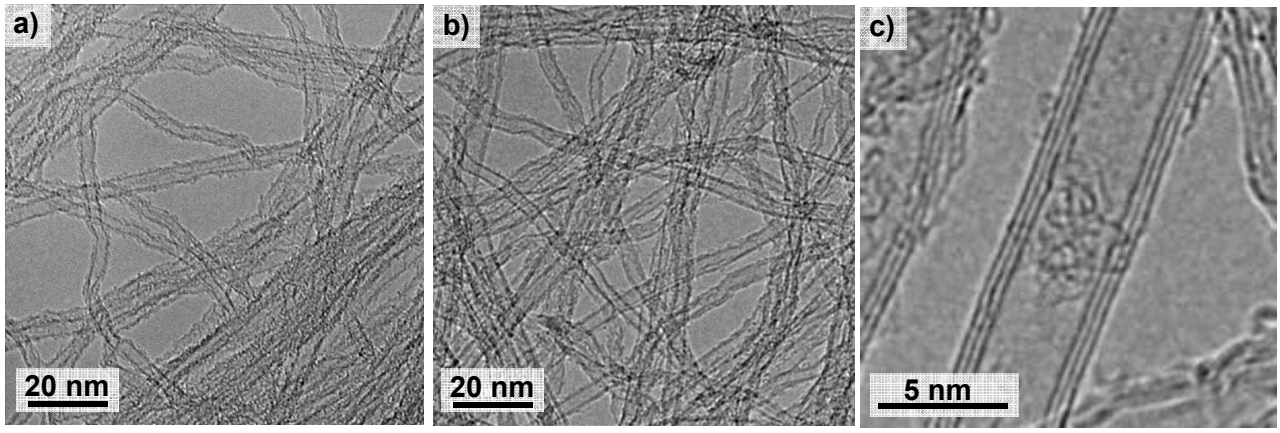

Fig. S1. Typical TEM images of (a) pristine CNTs, (b) NCNTs, and (c) NCNTs with high magnification. The cylindrical structures were preserved even after nitrogenation.

2. Raman spectra of pristine CNTs and NCNTs

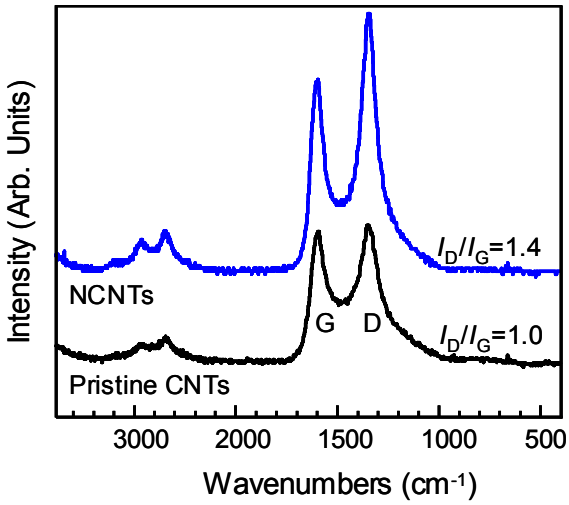

Fig. S2. Raman spectra of (a) pristine CNTs and (b) NCNTs. The intensity ratio of D and G bands (I_D/I_G) was increased after nitrogenation. The I_D/I_G has been reported to be inversely proportionate to in-plane crystallite size in nano-graphite,[S1] and occasionally in CNTs.[S2] The increase of I_D/I_G would at least indicate the promotion of disordering in the tube structure, and would be potentially related to decreased size of the ordered sp^2 domains in CNTs.

References

S1 M. J. Matthews, M. A. Pimenta, G. Dresselhaus, M. S. Dresselhaus and M. Endo, *Phys. Rev. B* 1999, **59**, R6585; L.G. Cançado, K. Takai, T. Enoki, M. Endo, Y. A. Kim, H. Mizusaki, A. Jorio, L. N. Coelho, R. Magalhães-Paniago and M. A. Pimenta, *Appl. Phys. Lett.* 2006, **88**, 163106.

S2 N. Soin, S. S. Roy, S. C. Ray and J. A. McLaughlin, *J. Raman Spectrosc*. 2010, **41**, 1227.