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Electronic Supplementary Information

for

Photoinduced electron doping of single-walled carbon nanotubes based on carboxamide photochemical reactions

*Naoki Tanaka, Taiki Ishii, Itsuki Yamaguchi, Aoi Hamasuna, Tsuyohiko Fujigaya**

Corresponding Author

Tsuyohiko Fujigaya: fujigaya.tsuyohiko.948@m.kyushu-u.ac.jp

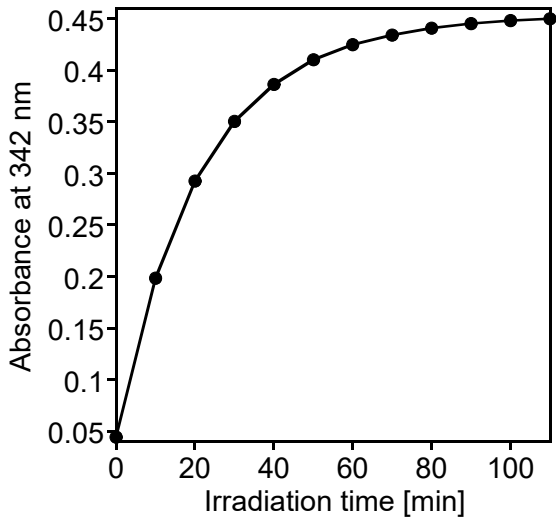

Fig. S1 254-nm UV irradiation time dependency of absorption peak intensities at 342 nm of ethanol solution of N-DMBI-Ox (0.02 mM).

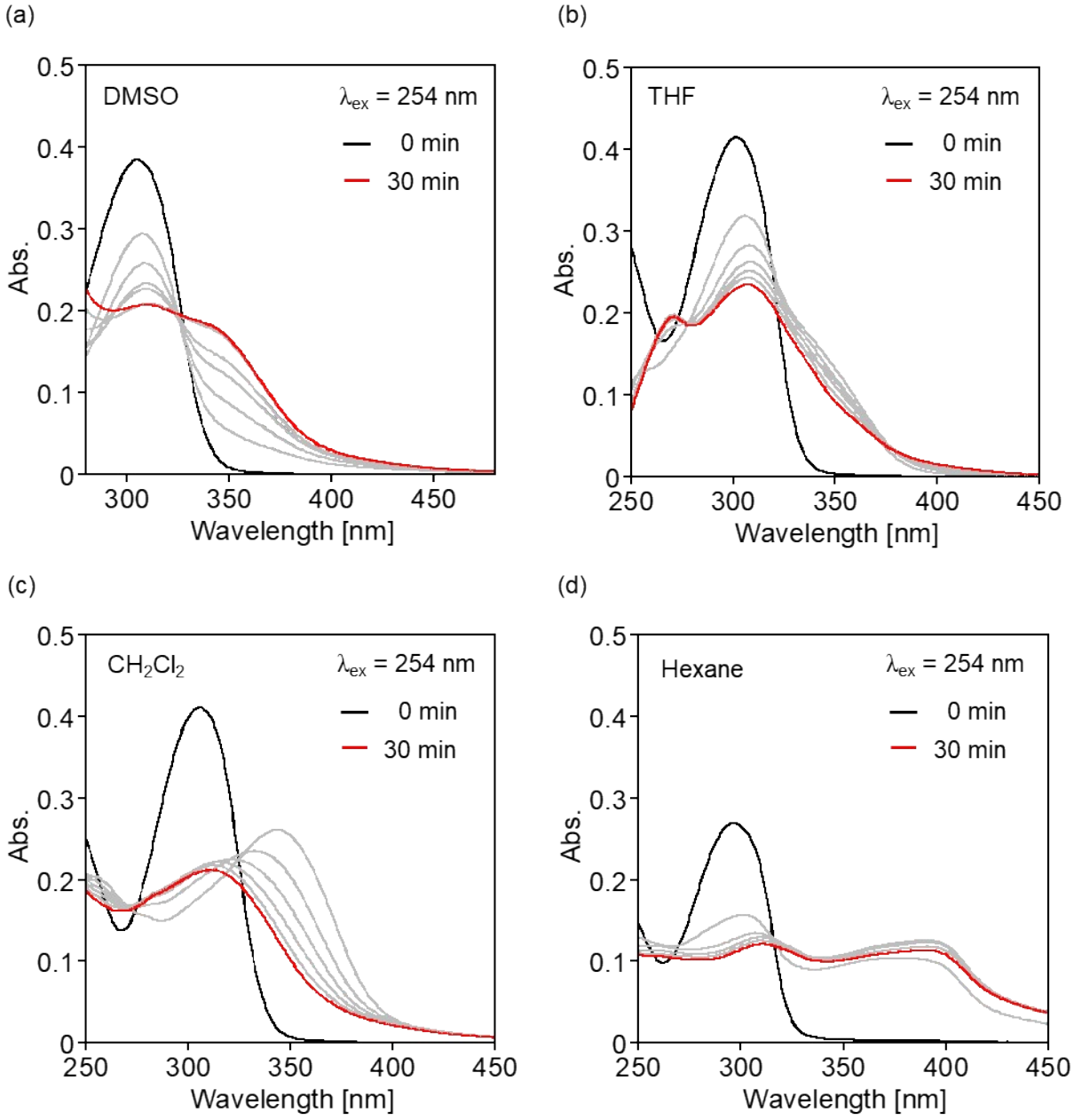

Fig. S2 UV-vis absorption spectra of N-DMBI-Ox after UV irradiation with 254 nm in (a) DMSO (0.02 mM), (b) THF (0.02 mM), (c) CH_2Cl_2 (0.02 mM), and (d) Hexane (0.01 mM).

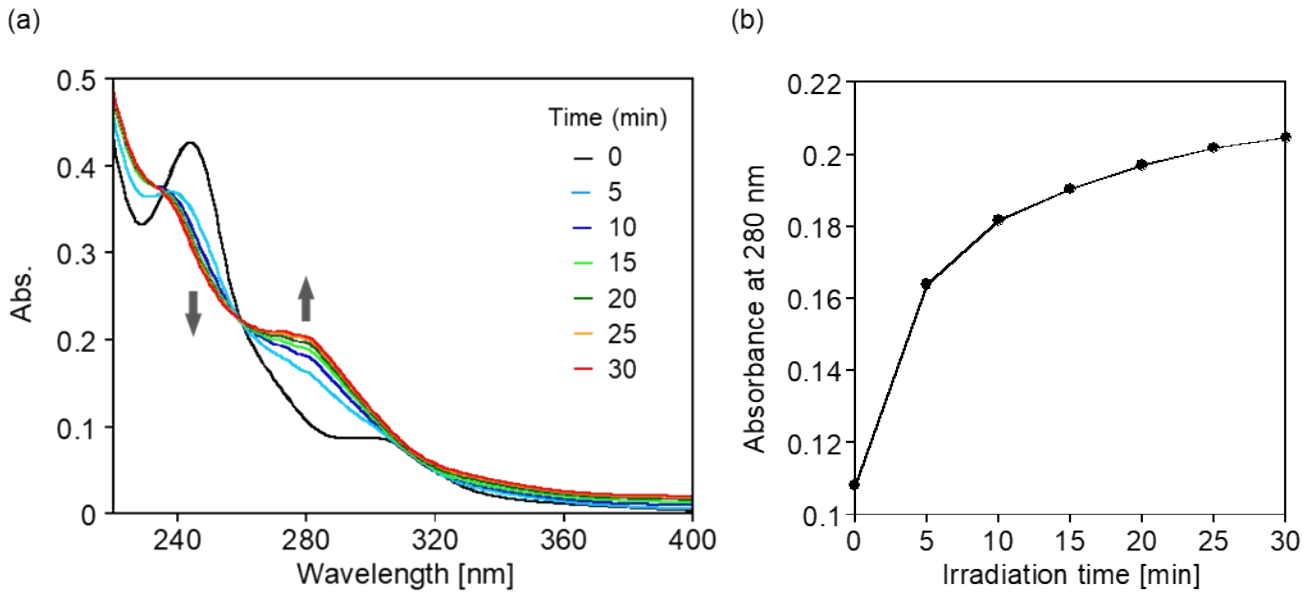

Fig. S3 (a) UV-vis absorption spectra of NO_2-DMBI-Ox in EtOH (0.02 mM) upon UV irradiation. (b) 254-nm UV irradiation time dependency of absorption peak intensities at 280 nm of ethanol solution of NO_2-DMBI-Ox (0.02 mM).

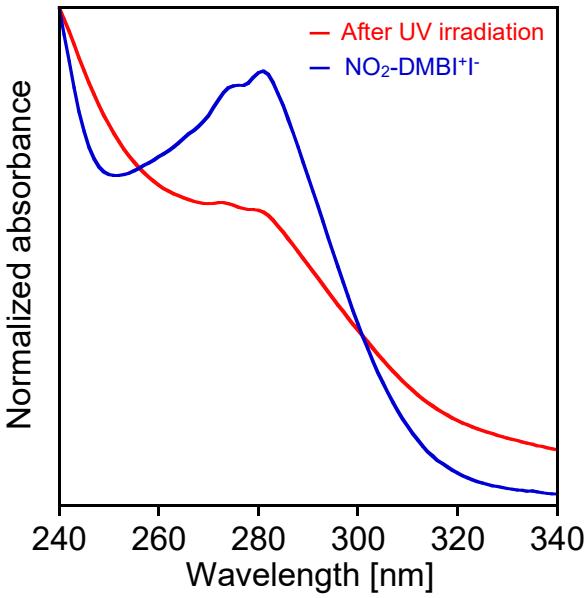

Fig. S4 UV-vis absorption spectra of NO_2-DMBI-Ox (red) after UV irradiation and NO_2-DMBI$^+$I$^-$ (blue) in EtOH.

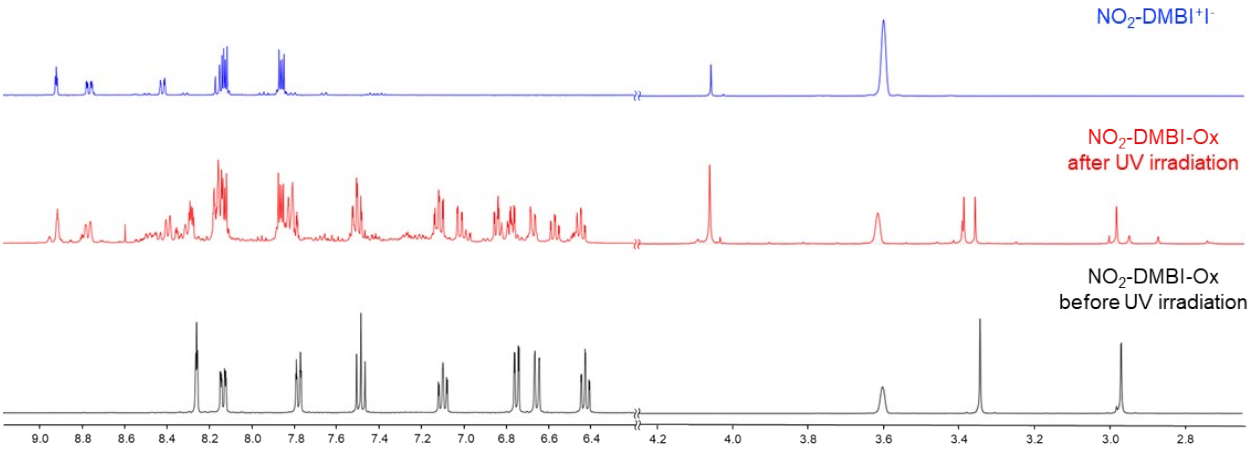

Fig. S5 ^{1}H NMR spectra of NO_2-DMBI^{+}I^{-} (blue) and NO_2-DMBI-Ox before (black) and after (red) UV irradiation for 72 hours in EtOH-d_3 solution.

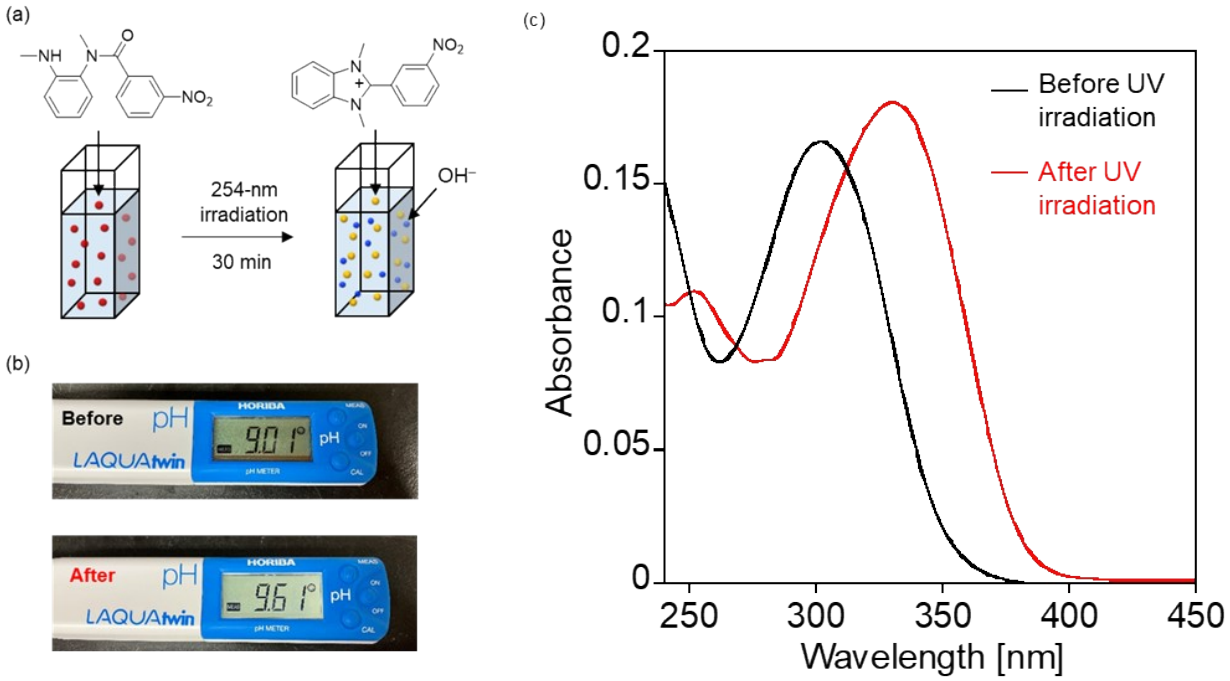

Fig. S6 (a) Schematic illustration of photochemical reaction of NO_2-DMBI-Ox in H_2O and (b) the pH changes of the suspension of NO_2-DMBI-Ox in H_2O before and after UV irradiation. (c) UV-vis absorption spectra of NO_2-DMBI-Ox in H_2O before (black) and after (red) UV irradiation.

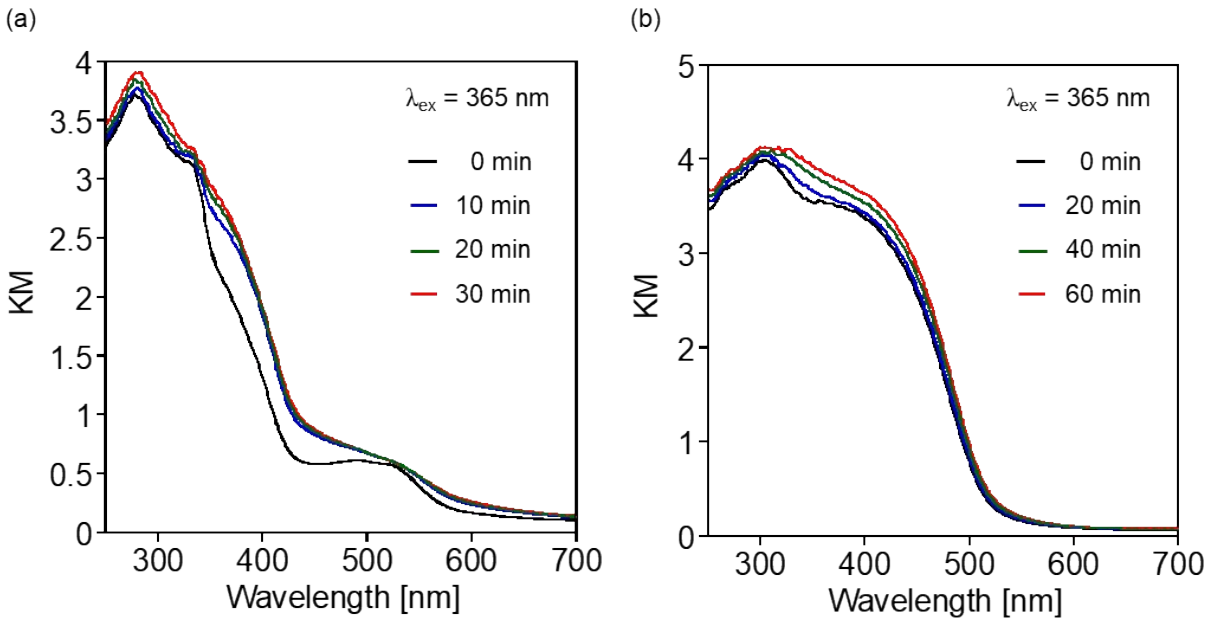

Fig. S7 Diffuse reflectance spectra of (a) N-DMBI-Ox and (b) NO2-DMBI-Ox upon UV irradiation. The Kubelka-munk function (KM) was calculated based on the kubelka-munk equation ($KM = (1–R)^2/2R$), where R is the relative reflectance of samples using barium sulfate as a standard sample by an integration sphere instrument.

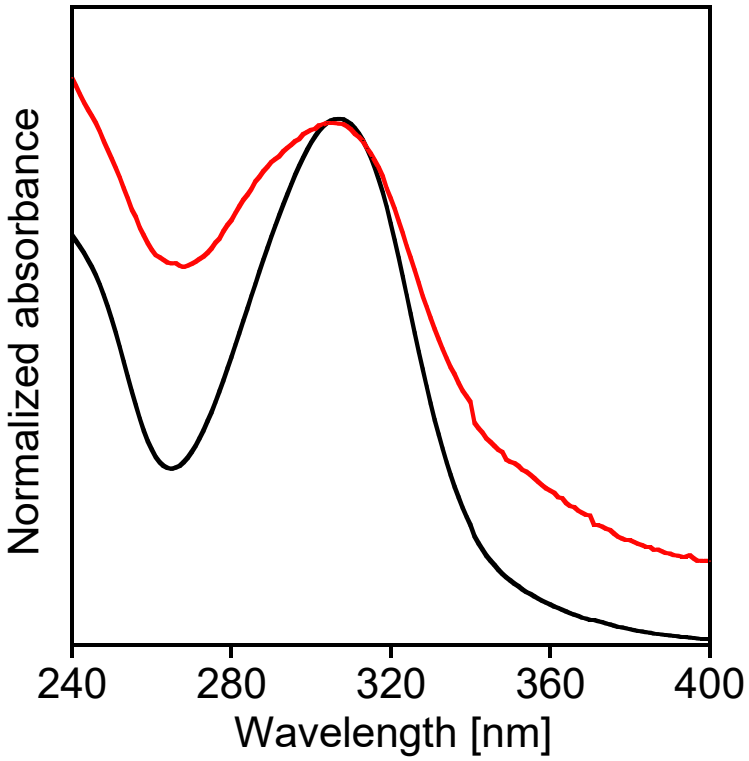

Fig. S8 UV-vis absorption spectra of extracted products (red) from SWCNT sheet after dipping in EtOH solution of N-DMBI-Ox (1.0 mM) and N-DMBI-Ox (black).

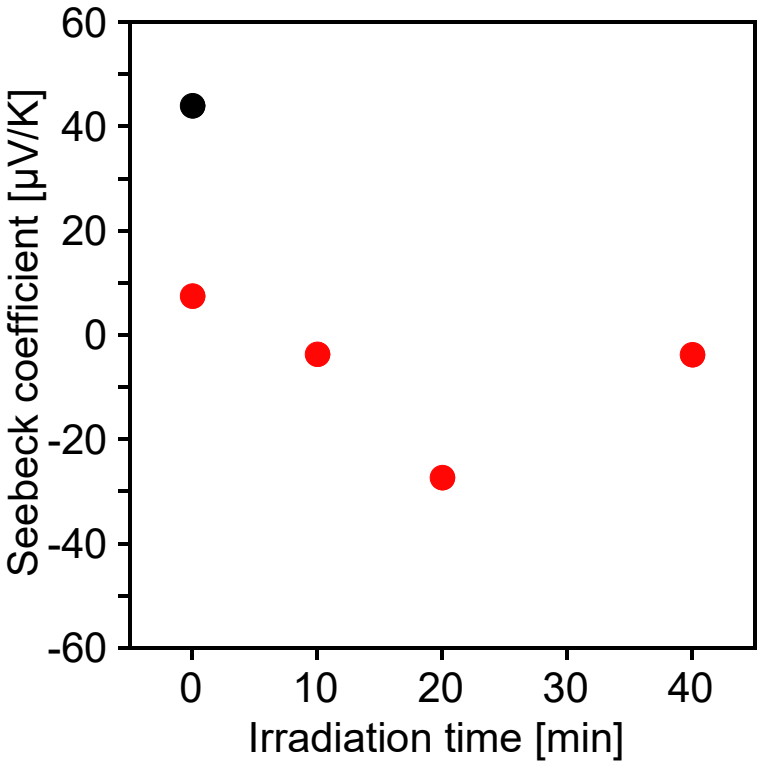

Fig. S9 Irradiation time dependency of Seebeck coefficient of the SWCNT sheets dipped with 1.0 mM of N-DMBI-Ox solutions (red) and pristine SWCNT (black).

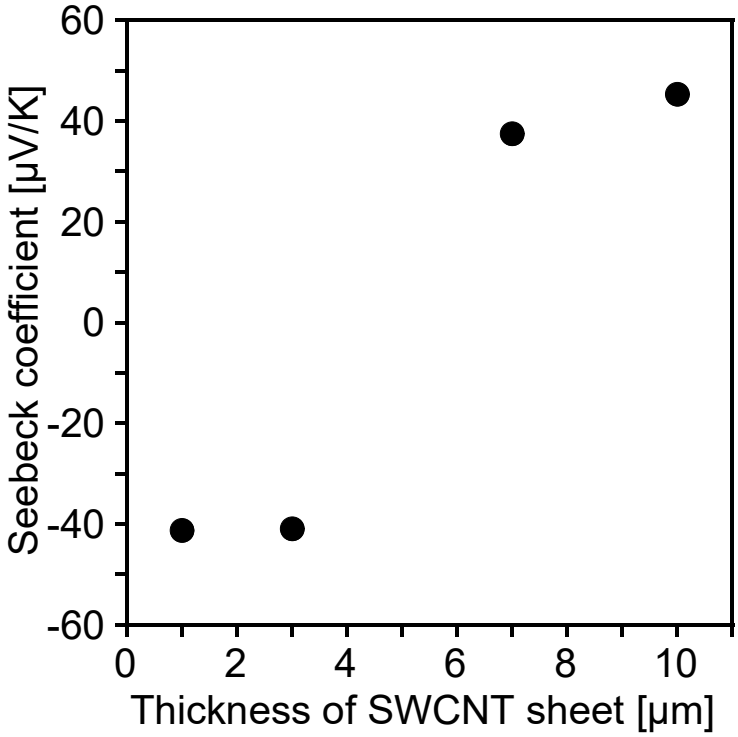

Fig. S10 Thickness dependency of Seebeck coefficient of SWCNT dipped with 1.0 mM of NO_2-DMBI-Ox solutions after UV irradiation at 365 nm for 20 min.

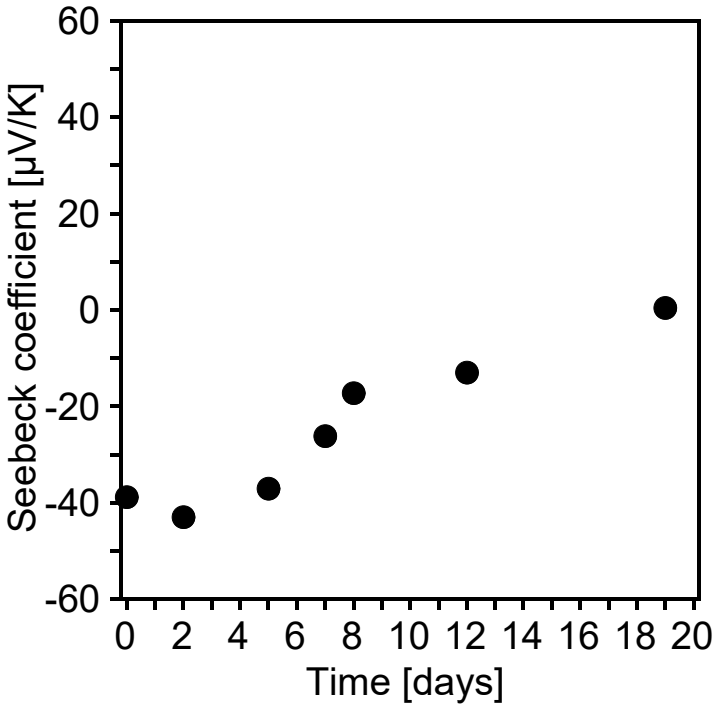

Fig. S11 Time course of the Seebeck coefficient of SWCNT sheets dipped with 1.0 mM of NO_2-DMBI-Ox solutions after UV irradiation at 365 nm for 20 min.

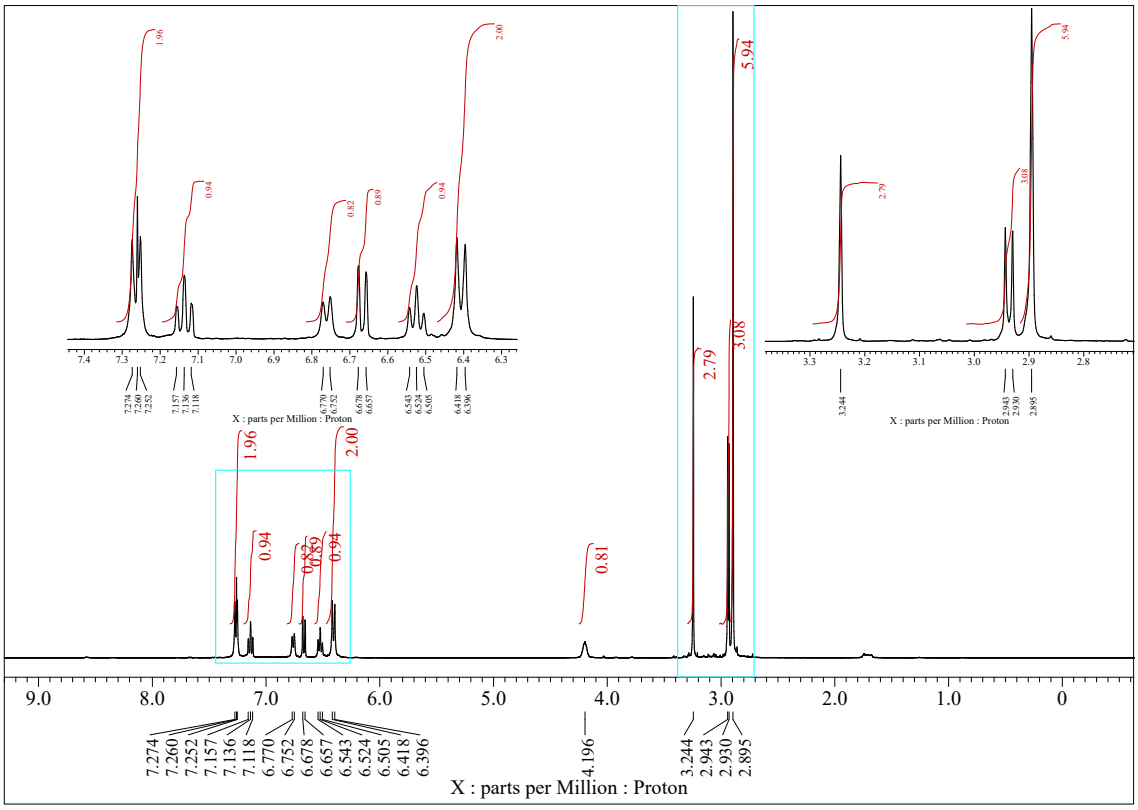

Fig. S12 ^{1}H NMR spectrum of N-DMBI-Ox (400 MHz, $CDCl_3$, 25 °C).

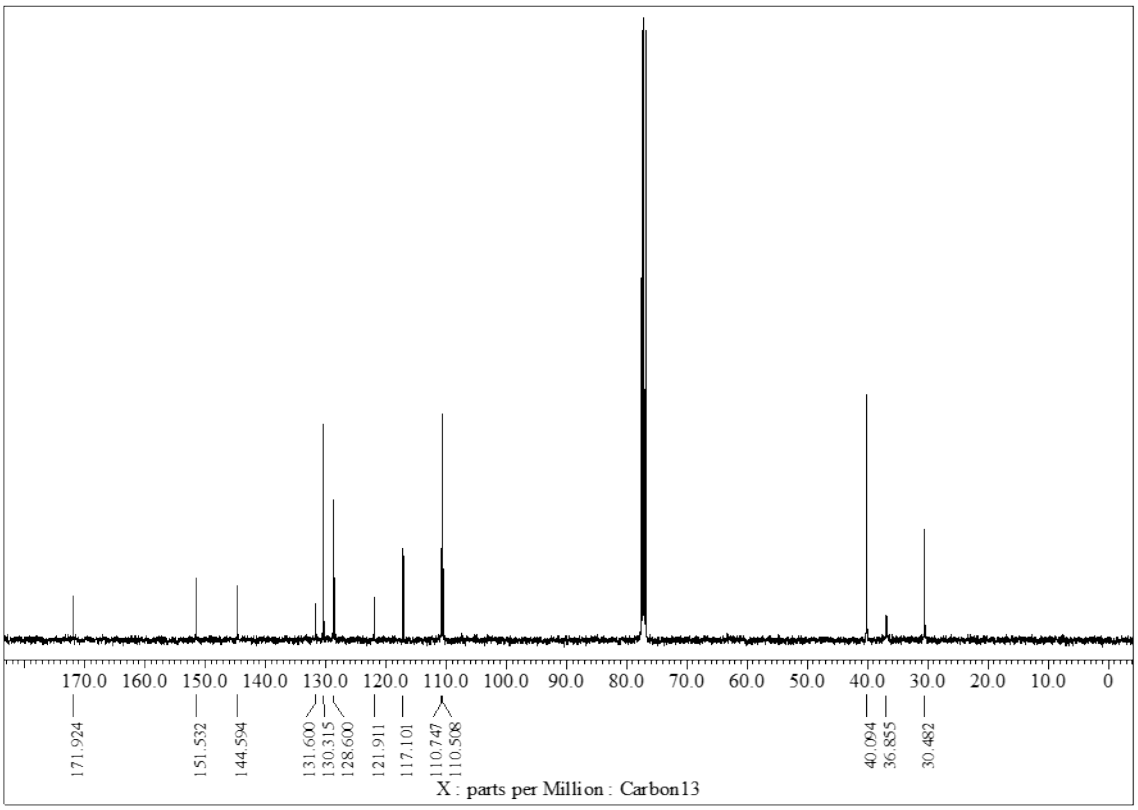

Fig. S13 ^{13}C NMR spectrum of N-DMBI-Ox (100 MHz, $CDCl_3$, 25 °C).

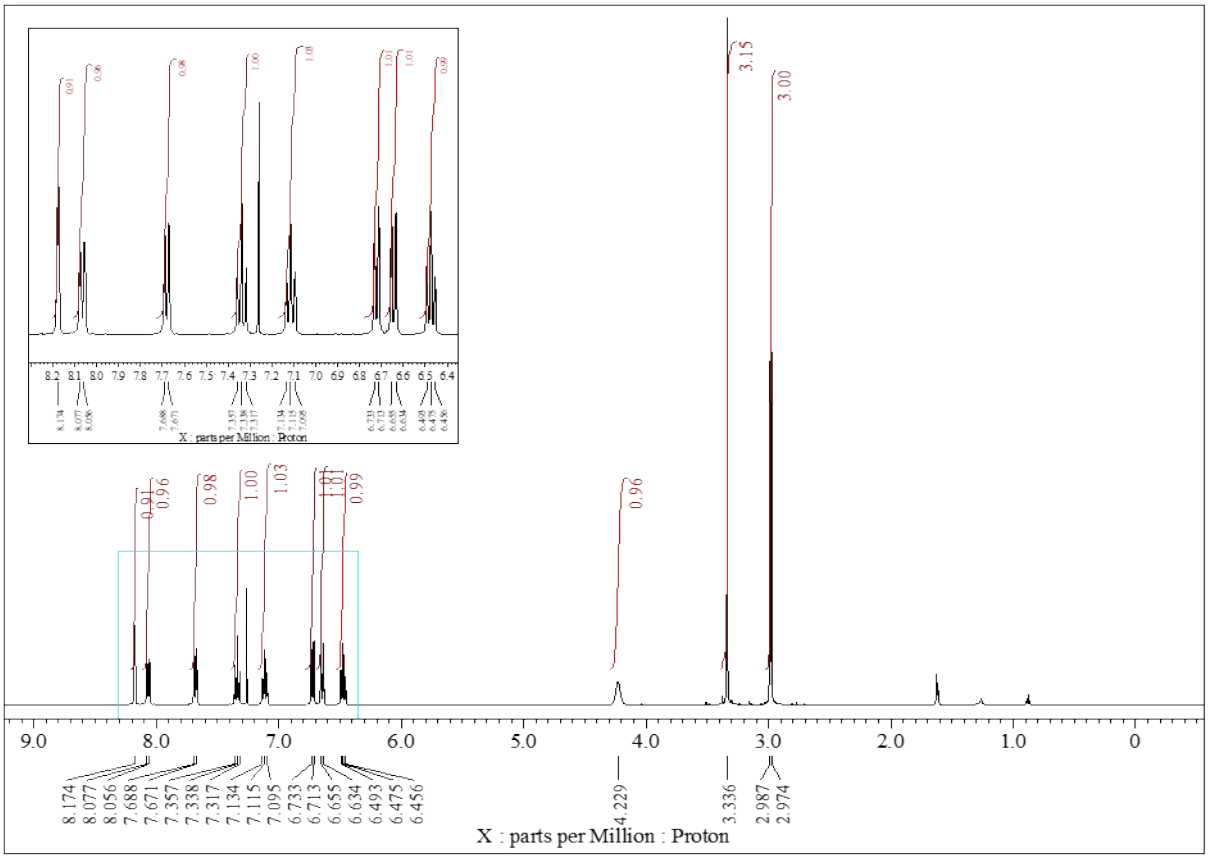

Fig. S14 ^{1}H NMR spectrum of NO_2-DMBI-Ox (400 MHz, $CDCl_3$, 25 °C).

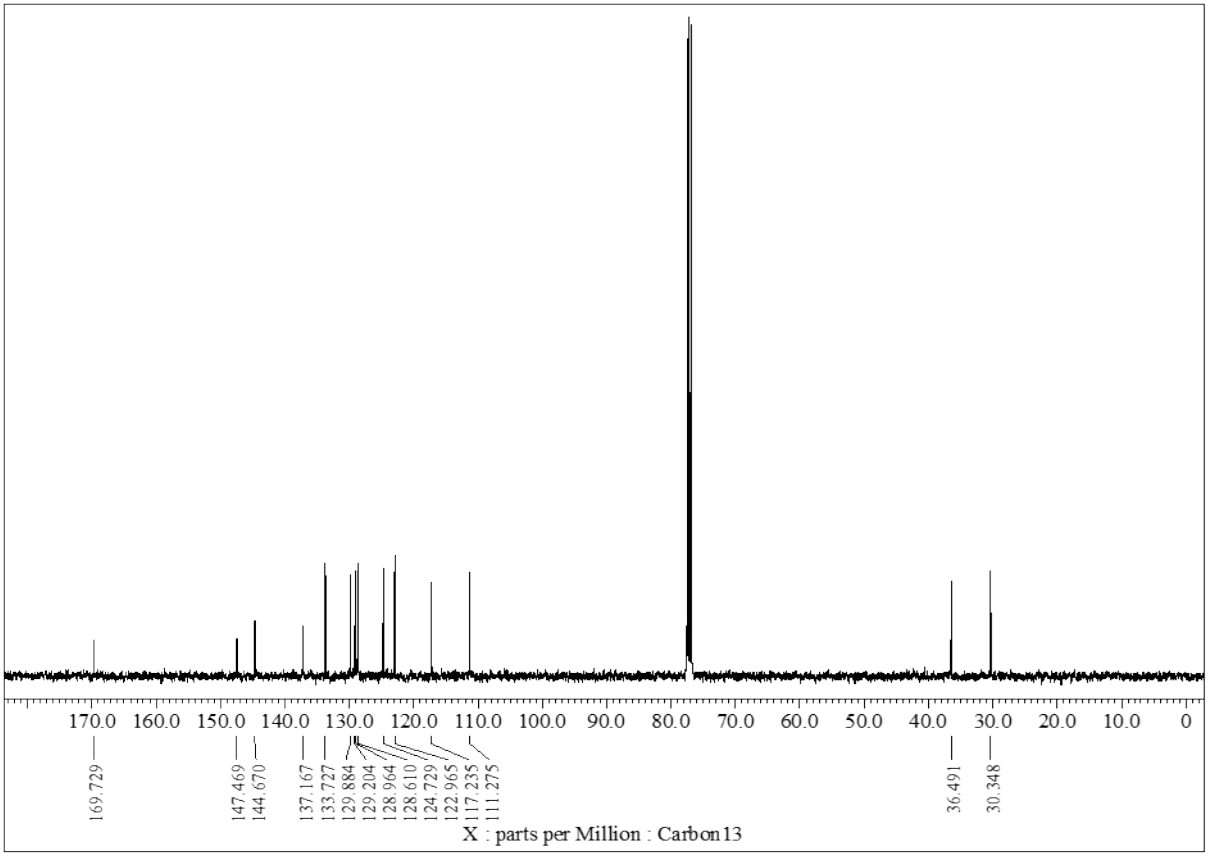

Fig. S15 ^{13}C NMR spectrum of NO_2-DMBI-Ox (100 MHz, $CDCl_3$, 25 °C).