Supporting Information

for

Arylboronate Ester Based Diazeniumdiolates (BORO/NO), a Class of Hydrogen Peroxide Inducible Nitric Oxide (NO) Donors

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2. General

All reactions were conducted under a nitrogen atmosphere. All the chemicals were purchased from commercial sources and used as received unless stated otherwise. *N*, *N*-Dimethylformamide (DMF), Diethyl ether, Carbontetrachloride and tetrahydrofuran (THF) for reaction were used as received, and petroleum ether and ethyl acetate (EtOAc) for chromatography were distilled before use. Column chromatography was performed on Rankem silica gel (60–120 mesh). ^{1}H and ^{13}C spectra were recorded on JEOL 400 MHz (or 100 MHz for ^{13}C) spectrometers using either residual solvent signals as an internal standard ($CHCl_3$ δ_H, 7.24 ppm, δ_C 77.1 ppm) or an internal tetramethylsilane (δ_H = 0.00, δ_C = 0.0). Chemical shifts (δ) are reported in ppm and coupling constants (*J*) in Hz. The following abbreviations are used: m (multiplet), s (singlet), d (doublet), t (triplet), dd (doublet of doublet). High-resolution mass spectra (HRMS) were obtained from HRMS-ESI-Q-Time of Flight LC/MS. FT-IR spectra were recorded using NICOLET 6700 FT-IR spectrometer as KBr disc. High performance liquid chromatography (HPLC) was performed on a Dionex ICS-3000 chromatograph. Photometric measurements were performed using a Thermo Scientific Varioscan microwell plate reader.

2. Synthesis and characterization:

Compound **4**[1] was synthesized by using a previously reported procedure and analytical data that we collected were consistent with the reported values.

2.1 **General procedure for the synthesis of 2**. To an ice cold solution of DEA/NO (**1a**, 1.2 mmol) in THF (3 mL), 15-crown-5 (0.01 mL) was added and the mixture stirred at 0 ºC for 5 min under a nitrogen atmosphere. A solution of compound **5** (1 mmol) in DMF (1 mL) was added to the reaction mixture at 0 ºC and stirred at room temperature for 4 h. The solvent was evaporated under reduced pressure, diluted with 25 mL of water and the aqueous solution was extracted with DCM (3×5 mL). The combined organic layer was washed with brine, dried over Na_2SO_4 (5 g), filtered and the filtrate was concentrated to give a crude compound, which was passed through silica gel (60-120 mesh) column chromatography using ethyl acetate (1→25 %) and petroleum ether solvent system to obtain a crude product. The mixture was further purified using semi-preparative HPLC with C-18 semi-preparative column, eluant consisting a gradient of acetonitrile (ACN) and water (40 – 80%), under ambient temperature with a flow rate of 2.5 mL/min for a 25 min program to obtain pure material.

1-((4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl)-4-methyl-[1-(N,N-diethylamino) diazen-1-ium-1,2-diol-2-ate] (2a): Starting from compound **1a** (125 mg, 0.81 mmol) product (**2a**, 38 mg, 16%) was isolated as a pink oil: FT-IR (ν_{max}, cm^{-1}): 2979, 2929, 1614, 1508, 1360, 1146, 1084; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 7.76 (d, *J* = 8.1 Hz, 2H), 7.35 (d, *J* = 8.0 Hz, 2H), 5.26 (s, 2H), 3.04 (q, *J* = 7.1 Hz, 4H), 1.32 (s, 12H), 0.99 (t, *J* = 7.1 Hz, 6H); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 138.8, 135.0, 127.5, 83.9, 75.5, 48.8, 24.9, 11.6; HRMS (ESI) for $[C_{17}H_{28}BN_3O_4+Na]^+$: Calcd. 372.2070, Found. 372.2071.

1-((4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl)-4-methyl-[1-(N,N-dimethylamino) diazen-1-ium-1,2-diol-2-ate] (2b): Starting from compound **1b** (205 mg, 1.62 mmol) a white solid (**2b**, 19 mg, 4%) was isolated: FT-IR (ν_{max}, cm^{-1}): 2978, 2924, 1617, 1493, 1360, 1208, 1143, 1087; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 7.78 (d, *J* = 8.0 Hz, 2H), 7.36 (d, *J* = 8.0 Hz, 2H), 5.20 (s, 2H), 2.94 (s, 6H), 1.32 (s, 12H); ^{13}C NMR ($CDCl_3$,

100 MHz): δ 138.9, 135.0, 127.7, 83.9, 75.3, 42.9, 24.9; HRMS (ESI) for $[C_{15}H_{24}BN_3O_4+Na]^+$: Calcd. 344.1757, Found. 344.1768.

1-((4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl) phenyl)-4-methyl-[1-(pyrrolidynyl)diazen-1-ium-1,2-diol-2-ate] (2c): Starting from compound **1c** (247 mg, 1.62 mmol) a yellow oil was obtained (**2c**, 19 mg, 4%): FT-IR (ν_{max}, cm^{-1}): 2978, 2928, 2861, 1657, 1612,1478, 1360, 1272, 1144, 1085; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 7.72 (d, *J* = 7.9 Hz, 2H), 7.31 (d, *J* = 7.9 Hz, 2H), 5.11 (s, 2H), 3.41 (t, *J* = 6.7 Hz, 4H), 1.83 (q, *J* = 3.4 Hz, 4H), 1.27 (s, 12H); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 139.3, 134.9, 127.7, 83.9, 75.0, 50.9, 24.9, 22.8; HRMS (ESI) for $[C_{17}H_{26}BN_3O_4+Na]^+$: Calcd. 370.1913, Found. 370.1911.

1-((4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl)-4-methyl-[2-methylpiperidinyl) diazen-1-ium-1,2-diol-2-ate] (2d): Starting from compound **1d** (115 mg, 0.64 mmol) a pale yellow oil (**2d**, 24 mg, 12%) was obtained: FT-IR (ν_{max}, cm^{-1}): 2974, 2929, 1624, 1503,1362, 1148, 1086, 1017; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 7.76 (d, *J* = 8.0 Hz, 2H), 7.35 (d, *J* = 8.0 Hz, 2H), 5.27 (s, 2H), 3.17 (m, 3H), 1.68 (m, 6H), 1.32 (s, 12H), 0.92 (d, *J* = 6.1 Hz, 3H); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 138.7, 135.0, 127.4, 83.9, 75.5, 56.7, 54.1, 32.9, 25.1, 24.9, 23.2, 18.3; HRMS (ESI) for $[C_{19}H_{30}BN_3O_4+K]^+$: Calcd. 414.1966, Found. 414.1956.

1-((4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl)-2-methyl-[1-(N,N-diethylamino) diazen-1-ium-1,2-diol-2-ate] (3a): Starting from compound **1a** (125 mg, 0.81 mmol) a pale yellow oil was obtained (34 mg, 14%): FT-IR (ν_{max}, cm^{-1}): 2982, 1505, 1360, 1268, 1146; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 7.82 (d, *J* = 7.3 Hz, 1H), 7.43 (m, 2H), 7.29 (m, 1H), 5.63 (s, 2H), 3.06 (q, *J* = 7.2 Hz, 4H), 1.34 (s, 12H), 1.03 (t, *J* = 7.2 Hz, 6H); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 142.1, 136.1, 131.1, 127.7, 127.3, 83.9, 75.0, 48.9, 24.9, 11.6; HRMS (ESI) for $[C_{17}H_{28}BN_3O_4+Na]^+$: Calcd. 372.2070, Found. 372.2073.

1-((4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl)-2-methyl-[1-(N,N-dimethylamino) diazen-1-ium-1,2-diol-2-ate] (3b): Starting from compound **1b** (205 mg, 1.62 mmol) a pale yellow semi solid was obtained (10 mg, 2%): FT-IR (ν_{max}, cm^{-1}): 3446, 2983, 2921, 1653, 1499, 1352, 1144, 1014; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 7.81 (d, *J* = 7.3 Hz, 1H), 7.41 (m, 2H), 7.29 (m, 1H), 5.55 (s, 2H), 2.94 (s, 6H), 1.33 (s, 12H); ^{13}C

NMR ($CDCl_3$, 100 MHz): δ 142.1, 135.9, 131.1, 127.9, 127.3, 83.8, 74.7, 43.0, 24.8; HRMS (ESI) for $[C_{15}H_{24}BN_3O_4+Na]^+$: Calcd. 344.1757, Found. 344.1758.

1-((4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl)-2-methyl-[2-methylpiperidinyl) diazen-1-ium-1,2-diol-2-ate] (3c): Starting from compound **1d** (293 mg, 0.81 mmol) a pale yellow oil was obtained (10 mg, 2%): FT-IR (ν_{max}, cm^{-1}): 2936, 2856, 1502, 1445, 1352, 1147, 1020; ^1H NMR ($CDCl_3$, 400 MHz): δ 7.82 (d, *J* = 7.4 Hz, 1H), 7.42 (d, *J* = 4.1 Hz, 2H), 7.29 (m, 1H), 5.63 (s, 2H), 3.19 (m , 3H), 1.76 (m , 6H), 1.34 (s, 12H), 0.98 (d, *J* = 6.1 Hz, 3H); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 141.9, 136.0, 131.1, 127.4, 127.2, 83.8, 75.0, 56.6, 54.1, 32.9, 25.1, 24.9, 23.3, 18.4; HRMS (ESI) for $[C_{19}H_{30}BN_3O_4+Na]^+$: Calcd. 398.2226, Found. 398.2225.

1-((5-methoxy-1-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl) phenyl)-4- [1-(N,N-diethylamino)diazen-1-ium-1,2-diol-2-ate] (3d): Starting from compound **1a** (185 mg, 0.59 mmol) a colorless oil was obtained (11 mg, 3%): FT-IR (ν_{max}, cm^{-1}): 2983, 1607, 1507,1452, 1359, 1233, 1145, 1029; ^1H NMR ($CDCl_3$, 400 MHz): δ 7.75, (d, *J* = 8.3 Hz, 1H), 7.0 (d, *J* = 2.5 Hz, 1H), 6.79 (dd, *J* = 8.3, 2.5 Hz, 1H), 5.61 (s, 2H), 3.78 (s, 3H), 3.07 (q, *J* = 7.2 Hz, 4H), 1.31 (s, 12H), 1.04 (*t*, *J* = 7.2 Hz, 6H); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 162.2, 144.7, 138.0, 112.9, 112.8, 83.6, 74.9, 55.2, 48.9, 24.9, 11.7; HRMS (ESI) for $[C_{18}H_{30}BN_3O_5+Na]^+$: Calcd. 402.2176, Found. 402.2180.

Nitric oxide detection. A 10 mM stock solutions of compounds in DMSO and a 100 mM stock solution of H_2O_2 in water were prepared. A typical reaction mixture consisted of compound (25 μM, 1 eq) and H_2O_2 (250 μM, 10 eq) were prepared by mixing 1.25 μL of compound and 1.25 μL of H_2O_2 from the stock solutions with 497.5 μL of pH 7.4 phosphate buffer (10 mM buffer containing 100 μM of diethylene triamine pentaacetic acid (DTPA), a metal ion chelating agent) at 37 ºC. An aliquot of the reaction mixture (10 μL) from the headspace of reaction vial was injected after 10 min into a Sievers Nitric Oxide Analyzer (NOA 280i) using argon as the carrier gas (Figure S1). For the experiment with the NO scavenger 2-(4-carboxyphenyl)-4,4,5,5-tetramethylimidazoline-1-oxyl-3-oxide potassium salt (250 μM, 10 eq., c-PTIO), the headspace gas (10 μL) was injected into the NOA chamber. The NOA chamber for these experiments did not contain any reducing agent but only acetic acid. The amount of NO released was estimated using a standard calibration curve (generated

using NO gas (99.999 % pure gas was diluted to 0.4 % with argon for calibration (0.1 mL in 25 mL of Argon gas).

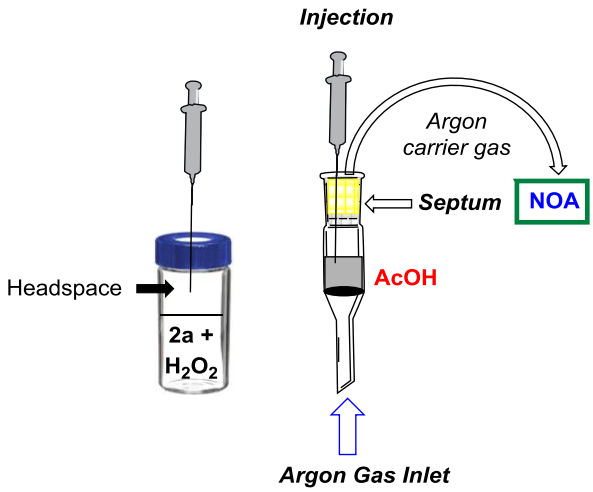


Figure S1. Schematic diagram of NOA experiment for gas phase NO measurement in acetic acid

Table S1. Nitric oxide data for **2a** – **2d, 3a – 3d** from headspace in the presence of H_2O_2.

Compound	[NO] (μM)[a]	S.D.[b]
2a	12.7986	0.9560
2b	4.0108	0.5629
2c	5.8134	0.3155
2d	6.3843	1.4812
3a	11.9273	1.1668
3b	6.1890	0.2862
3c	7.0753	0.9047
3d	11.7170	1.9503

[a]Under these conditions, the reported data is only for NO; [b]Standard deviation

NO generation from 2a with 1-10 eq., of H_2O_2. A 10 mM stock solution of **2a** in DMSO and 100 mM stock solution of H_2O_2 in water were prepared for quantifying amount of NO release from H_2O_2 mediated decomposition of **2a**. A reaction mixture of **2a** (25 μM, 1 eq.,) and H_2O_2 (0 -250 μM, 0 - 10eq) were prepared by mixing 1.25 μL of **2a** and respective volume of H_2O_2 from the stock solutions to 500 μL with of pH 7.4 phosphate buffer (10 mM containing 100 μM of DTPA) at 37 ºC. Headspace of reaction mixture (10 μL) and blank were injected after 10 min into a Sievers Nitric Oxide Analyzer (NOA 280i) containing acetic acid using argon as the carrier gas (Figure S1).

Table S2. Headspace NO generation from **2a** with 1-10 eq. of H_2O_2

Equivalents of H_2O_2	[NO] (μM)[a]	S. D.[b]
1	4.5	0.72
2	5.2	0.39
5	9.2	0.63
10	12.1	0.65

[a]Under these conditions, the reported data is only for NO; [b]Standard deviation.

Time course experiment for NO generation from 2a and 3a. A 10 mM stock solution of **2a** in DMSO and 100 mM stock solution of H_2O_2 in water were prepared for quantifying amount of NO release from H_2O_2 mediated decomposition. A reaction mixture of **2a** (25 μM, 1 eq.,) and H_2O_2 (250 μM, 10 eq.,) were prepared by mixing 1.25 μL of **2a** and 1.25 μL of H_2O_2 from the stock solutions with 500 μL of pH 7.4 phosphate buffer (10 mM containing 100 μM of DTPA) at 37 ºC. Headspace of the reaction mixtures (10 μL) and blank were analyzed for NO. A similar procedure was followed for recording **3a** decomposition kinetics (Figure S1).

Table S3. Time course of headspace NO generation from **2a** with 10 eq. of H_2O_2

Time (min)	[NO] (μM)[a]	S. D.[b]
2	1.32	0.26
4	5.25	0.03
6	8.38	1.08
8	10.46	1.33
10	12.80	0.96

[a]Under these conditions, the reported data is only for NO; [b]Standard deviation.

Table S4. Time course of headspace NO generation from **3a** with 10 eq. of H_2O_2

Time (min)	[NO] (μM)[a]	S. D.[b]
2	1.67	0.25
4	5.54	0.06
6	10.27	1.15
8	12.98	0.70
10	14.87	1.21

[a]Under these conditions, the reported data is only for NO; [b]Standard deviation.

For the solution phase data, the reactions were prepared in a manner identical to those described earlier except that the aliquot from the solution was injected in to a Sievers Nitric Oxide Analyzer (NOA 280i) containing reducing agents (sodium iodide and acetic acid) using argon as the carrier gas (Figure S2). $NaNO_2$ standards in the presence of NaI and acetic acid for the measurement of NO in solution were used for generating a calibration curve.

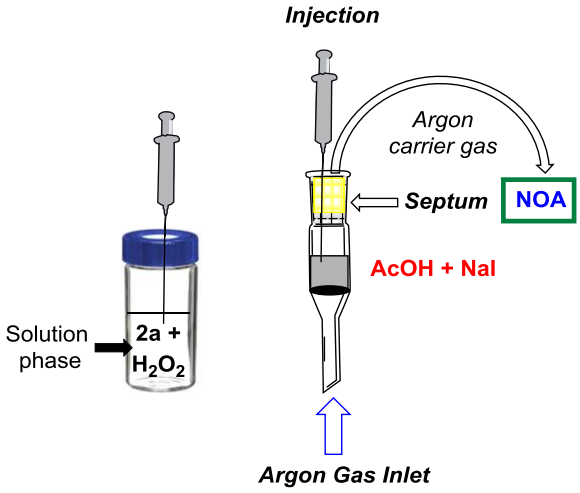


Figure S2. Schematic diagram of NOA experiment for solution phase NO measurement in NaI and AcOH.

Table S5. Nitric oxide data of compounds **2a** – **2d, 3a – 3d** in solution with H_2O_2

Compound	[NO] (μM)[a]	S.D.[b]
2a	33.3795	2.8010
2b	23.7327	1.5964
2c	27.5831	2.0273
2d	23.3449	1.3809
3a	27.3615	1.1067
3b	17.0637	0.8618
3c	19.1343	0.8129
3d	30.8102	1.7727

[a]Under these conditions, the reported data is for both NO as well as nitrite. [b]Standard deviation.

NOTE: Compounds **4**, **6** and **7** did not produce a significant signal in the NOA to calculate NO

NO generation from 2a with 1-10 eq., of H_2O_2 in solution. A 10 mM stock solution of **2a** in DMSO and 100 mM stock solution of H_2O_2 in water were prepared for quantifying amount of NO release from H_2O_2 mediated decomposition of **2a**. A reaction mixture of **2a** (25 μM, 1 eq.,) and H_2O_2 (0 -250 μM; 0 – 10 equiv) were prepared by mixing 1.25 μL of **2a** and respective volume of H_2O_2 from the stock solutions to 500 μL with pH 7.4 phosphate buffer (10 mM containing 100 μM of DTPA) at 37 ºC. Reaction mixture (10 μL) and blank were injected after 10 min into a Sievers Nitric Oxide Analyzer (NOA 280i) containing reducing mixture using argon as the carrier gas (Figure S2).

Table S6. NO generation from **2a** with 1-10 eq. of H_2O_2

Equivalents of H_2O_2	[NO] (μM)[a]	S. D.[b]
1	4.2	0.51
2	6.6	1.45
5	18.0	1.91
10	32.0	1.57

[a]Under these conditions, the reported data is only for NO; [b]Standard deviation.

Selectivity studies of 2a with oxidants and reductants. Compound **2a** was prepared as mentioned earlier and reacted with different reactive species. Reactive oxygen species (10 eq., 100 μM) were administered to **2a** in 10 mM phosphate buffer (pH 7.4, containing 100 μM of DTPA (except for Fe^{2+} and $^{\bullet}OH$), at 37 °C) as follows. Stock solutions of (10 mM) H_2O_2 (30%), *tert*-butylhydroperoxide (TBHP, 70%), and hypochlorite (NaOCl, 10%) were prepared from commercial sources. Hydroxyl radical ($^{\bullet}OH$), was generated by reaction of 10 mM Fe^{2+} with 1 mM H_2O_2.[2] Superoxide ($O_2^{-\bullet}$) was delivered from the enzymatic reaction of xanthine oxidase (0.02 unit/mL) and hypoxanthine 10 mM (in phosphate buffer pH 7.4).[2] *N*-acetylcysteine, glutathione solutions (10 mM) were prepared in de-ionized water. 2,2,6,6-Tetramethylpiperidinyloxy (TEMPO) solutions (10 mM) were prepared in DMSO. After 10 min of incubation at 37 °C reaction mixture was analyzed for NO, headspace NO analysis was carried out for H_2O_2 (except for H_2O_2, NO measurement was performed out with reducing mixture

in the NOA chamber to identify any NO or nitrite generation, for H_2O_2, acetic acid was used as described above).

Table S7. NO generated from compound **2a** with various biologically relevant species

Species	NO (μM)[a]
N-Acetylcysteine	1.19
Glutathione	1.19
Tempo free radical	1.19
Fe^{2+}	1.19
tert-Butylhydroperoxide	1.19
Sodium hypochlorite	1.19
Superoxide radical	1.19
Hydroxyl radical	1.19
H_2O_2	33.38[b]

[a]Under these conditions, the reported data is for both NO as well as nitrite. [b]Under these conditions, the reported data is only for NO.

Real-time Nitric oxide analysis from 2a. The reaction chamber of the nitric oxide analyzer containing **2a** (50 μM) in phosphate buffer (10 mM, pH 7.4, 7 mL) was purged with argon for baseline stabilization. H_2O_2 (10 equiv) was injected to the reaction mixture and NO release was monitored over a period of 1 h using NOA (low sensitivity mode). (Figure S3)

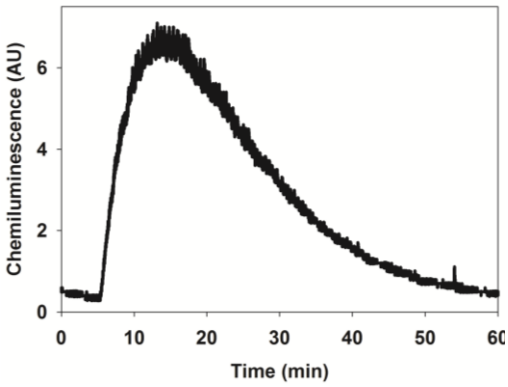


Figure S3. Real time nitric oxide analysis from **2a** (50 μM) with 10 equiv of H_2O_2 in buffer

Estimation of extracellular nitrite in bacterial cells. *Escherichia Coli* (ATCC 25922) and *Pseudomonas aeruginosa* (PA, 5029) in 5 mL of Luria Bertani (LB) medium and Methicillin sensitive *Staphylococcus aureus* (MSSA 25293), Methicillin resistant *Staphylococcus aureus* (MRSA 33591) in 5 mL of cation – adjusted Miller Hinton broth (CA-MHB) medium were cultured at 37 ºC for 3 h.

Bacteria were centrifuged to remove the supernatant media and the bacterial pellet was re-suspended with pH 7.4 phosphate buffer (25 mM) to an O.D of 0.20. A stock solution of the **2a** (25 μM) with and without 10 eq. of H_2O_2, in DMSO (0.5%) were added to the bacterial suspension. In another experiment, compounds **2a**, **2a**+C-PTIO (2-(4-Carboxyphenyl)-4,4,5,5-tetramethylimidazoline-1-oxyl-3-oxide (c-PTIO), a NO scavenger), **4**, **6** and **7** (50 μM) were incubated with *E .coli* for extracellular NO for 60 min. After incubation for mentioned time period at 37 ºC, Griess' reagent (7μL for 100 μL reaction mixture, Sigma Aldrich) was added, and incubated at RT for 25 min before measuring OD at 535 nm using Varioskan microplate reader. A calibration curve was generated using standard sodium nitrite solution of concentration from 0 – 5 μM using the Griess' reagent. The data represented here is for 6 replicates of 2 independent experiments (Table S7). Measurement of extracellular nitrite generated by **2a** and controls (50 μM) with bacteria after 60 min was recorded and the data is presented in Table S8. A similar experiment was conducted with **2a** and *P. aeruginosa*, MSSA and MRSA and this data is tabulated in Table S9.

Table S8. Calibration curve for nitrite in pH 7.4 phosphate buffer (25 mM):

$[NO_2^-]$	O. D.[a]	S. D.[b]
0.0	0.0554	0.0026
1.0	0.0790	0.0082
2.0	0.1046	0.0065
3.0	0.1181	0.0095
4.0	0.1489	0.0079

[a]Optical Density (O. D); [b]Standard deviation

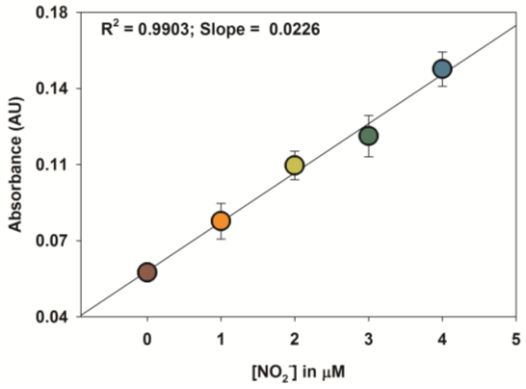


Figure S4. Calibration curve for nitrite in pH 7.4 phosphate buffer (25 mM)

Table S9. Measurement of extracellular nitrite generated by **2a** and controls (50 μM) with bacteria after 60 min

	NO (μM), untreated	S.D.[a]	NO (μM), + H_2O_2	S.D.[a]
E .coli	0.44	0.02	0.78	0.09
E .coli + **2a**	0.93	0.05	8.08	0.80
E .coli + **2a** + c-PTIO[c]	0.88	0.06	3.22	0.05
E .coli + **4**	0.51	0.03	0.58	0.06
E .coli + **6**	0.47	0.04	0.35	0.05
E .coli + **7**	0.58	0.05	0.61	0.07

[a]Standard deviation (S. D); [b](2-(4-carboxyphenyl)-4,4,5,5-tetramethylimidazoline-1-oxyl-3-oxide (c-PTIO), a NO scavenger).

Table S10. Measurement of extracellular nitrite generated by **2a** (25 μM) after 30 min

	O. D. (AU)[a]	S. D.[b]	$[NO_2^-]$ (μM)	S. D.[b]
E .coli + **2a**	0.0064	0.0098	0.2813	0.0443
E .coli + **2a** + H_2O_2	0.0915	0.0162	4.0489	0.4444
Pseudomonas aeruginosa + **2a**	0.0933	0.0120	0.6126	0.0785
Pseudomonas aeruginosa + **2a** + H_2O_2	0.2424	0.0359	7.2089	1.0672
MSSA[c] + **2a**	0.0396	0.0101	1.7540	0.1846
MSSA + **2a** + H_2O_2	0.1568	0.0140	6.9363	0.4556
MRSA[d] + **2a**	0.0424	0.0100	1.8743	0.1896
MRSA[d] +**2a** + H_2O_2	0.0899	0.0342	3.9793	0.9320

[a]Optical Density (O. D); [b]Standard deviation (S. D); [c]Methicillin sensitive *Staphylococcus aureus* (MSSA); [d]Methicillin resistant *Staphylococcus aureus* (MRSA).

Measurement of intracellular nitrite release in *E.coli*. *Escherichia Coli* (ATCC 25922) was cultured in 5 mL of Luria Bertani (LB) medium at 37 ºC for 3 h and re-suspended with fresh medium to an O.D of 1.0. A stock solution of the **2a** (100 μM) in DMSO (0.5%) was added to the bacterial suspension and incubated for 60 min at 37 ºC. Next, centrifugation of the bacterial suspension followed by removal of extracellular media to remove any excess **2a** was carried out. The collected bacterial pellet was re-suspended with pH 7.4 phosphate buffer and 100 μL aliquots were divided into several portions of a sterile flat bottom 96-well microtiter plate. Cells without any further treatment served as control. To the remaining wells, either H_2O_2 (1 mM, 10 eq.) alone or H_2O_2 (1 mM, 10 eq.) and c-PTIO (250 μM) were added. After 30 min, Griess' reagent (7 μL for 100 μL reaction mixture, Sigma Aldrich) was added, and incubated at RT for 25 min before measuring OD at 535 nm using Varioskan microplate reader. A calibration curve was generated using standard sodium nitrite solution of concentration from 0 – 5 μM using the Griess' reagent as described earlier.

Table S11. Intracellular nitrite generation from **2a** (25 μM) in bacteria

2a	S. D[a]	**2a** + H_2O_2	S. D[a]	**2a** + c-PTIO[b] + H_2O_2	S. D[a]
2.12	0.17	10.83	0.77	5.72	0.32

[a]Standard deviation (S. D); [b](2-(4-Carboxyphenyl)-4,4,5,5-tetramethylimidazoline-1-oxyl-3-oxide (c-PTIO), a NO scavenger).

Measurement of intracellular nitrite release in bacteria. MSSA (or MRSA) was cultured in 5 mL of cation – adjusted Miller Hinton broth (CA-MHB) medium at 37 ºC for 3 h and this was re-suspended to an O.D of 0.25with fresh CA-MHB medium. This bacterial solution was incubated with 25 μM of **2a** for 30 min, the bacterial suspension was centrifuged to aspirate out any excess of **2a** in the medium. The collected bacterial pellet was re-suspended with acetonitrile and the cells were lysed by vortexing it for 90 s (3 times). The cell lysate was then removed by centrifugation and the supernatant was plated in a 96-microwell plate with and without H_2O_2 (250 μM, 10 eq) after 10 min, Griess reagent (7 μL for 100 μL reaction mixture, Sigma Aldrich) was added, and analyzed for NO. The data represented here were repeated in 6 replicates of 2 independent

experiments. A protocol similar to the one used for *E. coli* was used in the case of *P. aeruginosa*, MSSA and MRSA (Table S11).

Table S12. Intracellular nitrite generation from **2a** (25 μM) in bacteria after 30 min

	O. D. (AU)[a]	S. D.[b]	$[NO_2^-]$ (μM)	S. D.[b]
P. aeruginosa +**2a**	0.0570	0.0077	0.2333	0.0317
P. aeruginosa +**2a**+H_2O_2	0.0779	0.0139	0.6922	0.1233
MSSA[d] +**2a**	0.0097	0.0148	0.4271	0.0961
MSSA + **2a** + H_2O_2	0.0362	0.0114	1.6018	0.1979
MRSA[d] + **2a**	0.0095	0.0112	0.4218	0.0721
MRSA + **2a** + H_2O_2	0.0336	0.0128	1.4859	0.2125

[a]Optical Density (O. D); [b]Standard deviation (S. D); [c]Methicillin sensitive *Staphylococcus aureus* (MSSA); [d]Methicillin resitant *Staphylococcus aureus* (MRSA).

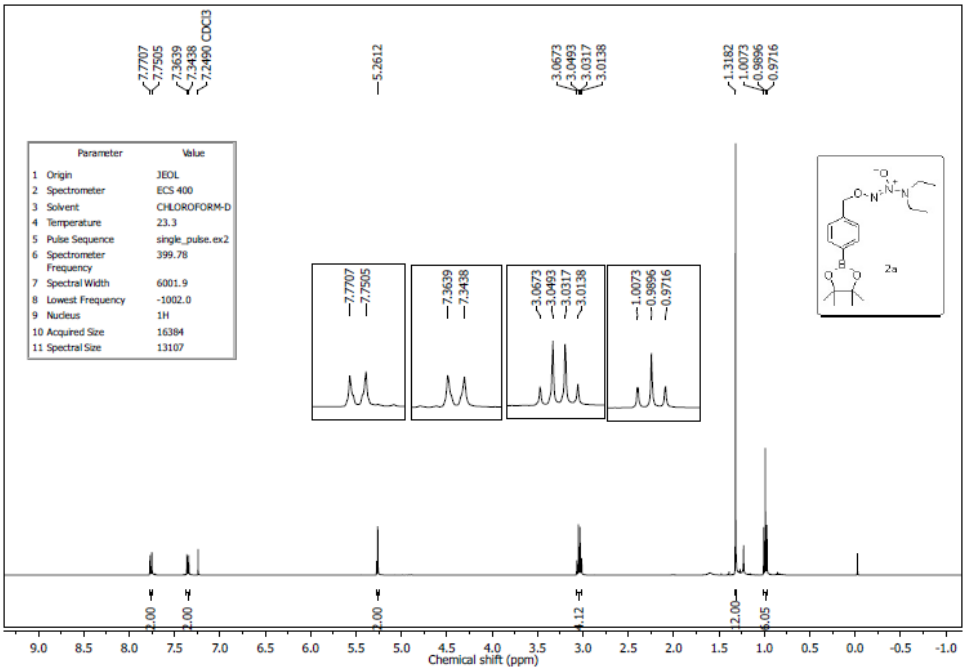
References.

(1) White, J. R.; Price, G. J.; Schiffers, S.; Raithby, P. R.; Plucinski, P. K.; Frost, C. G. *Tetrahedron Lett.* **2010**, *51*, 3913.

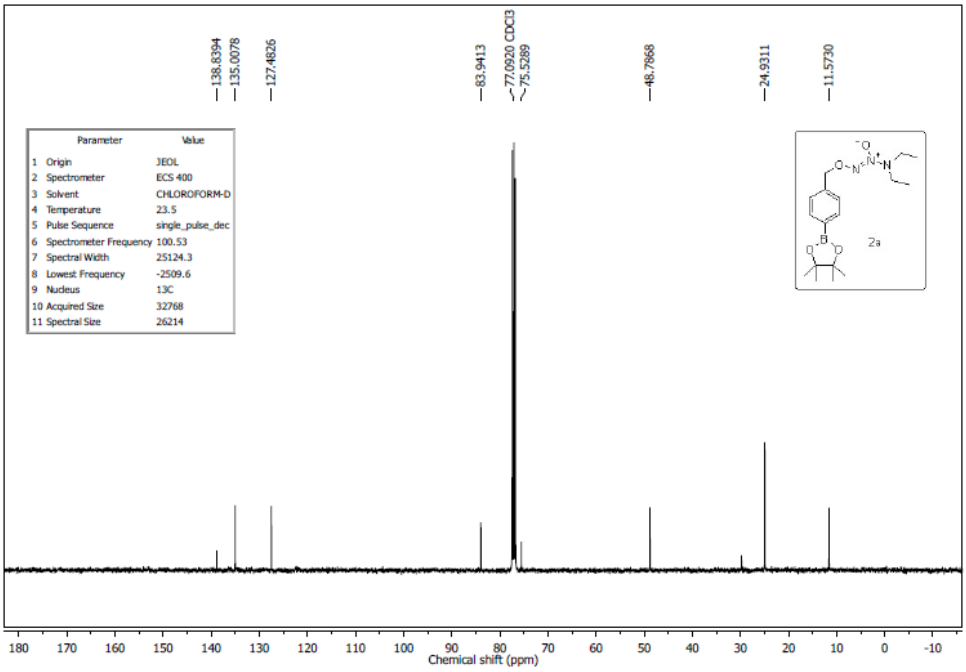
(2) Chung, C.; Srikun, D.; Lim, C. S.; Chang, C. J.; Cho, B. R. *Chem. Commun.* **2011**, *47*, 9618.

NMR Spectra.

^{1}H NMR of compound **2a**:



^{13}C NMR of compound **2a**:



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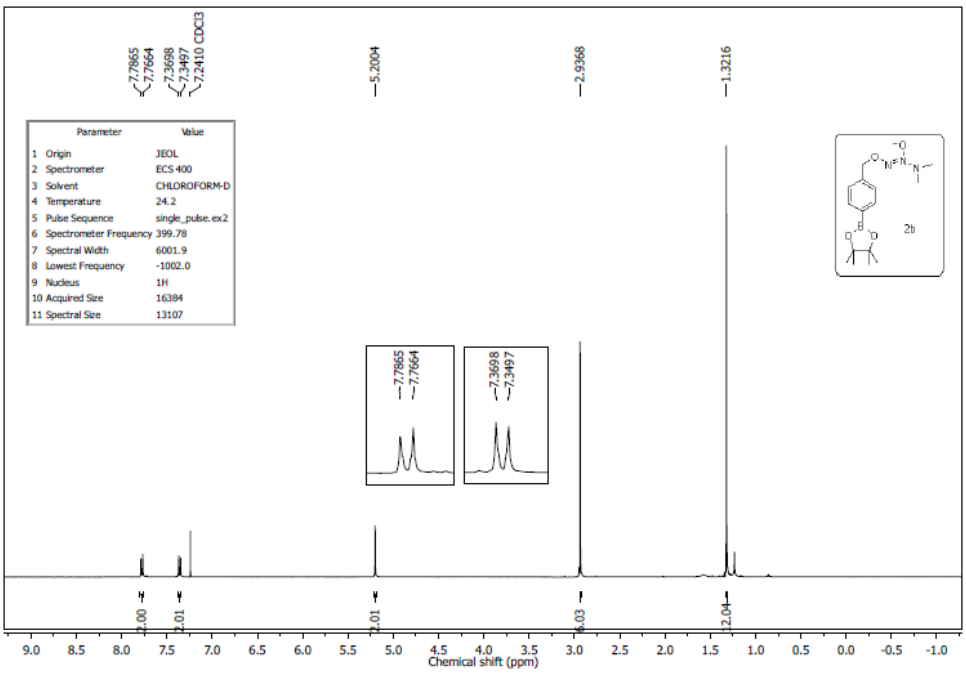

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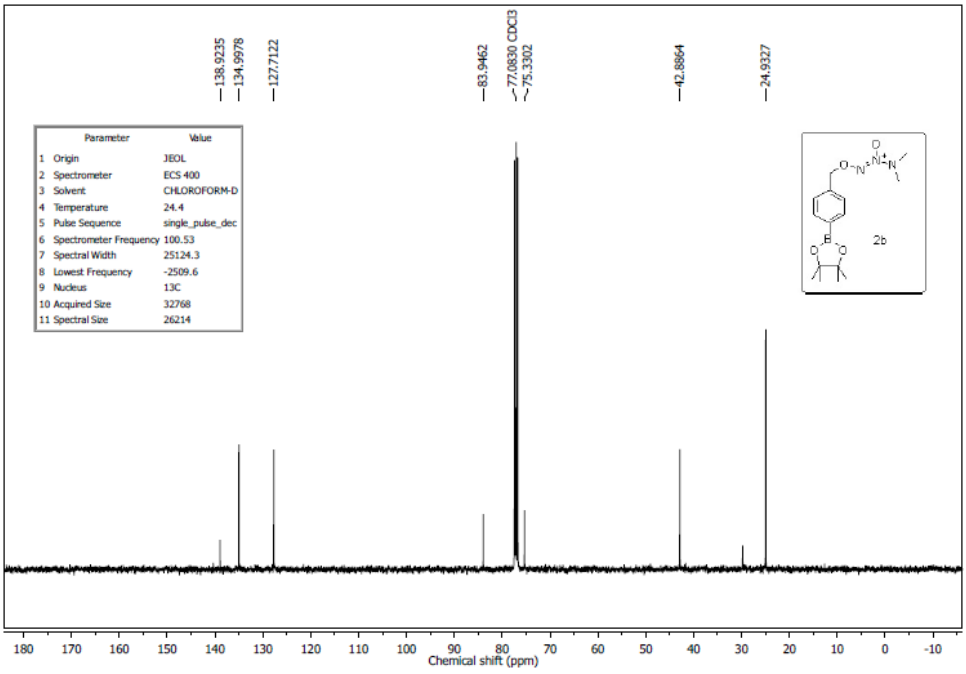

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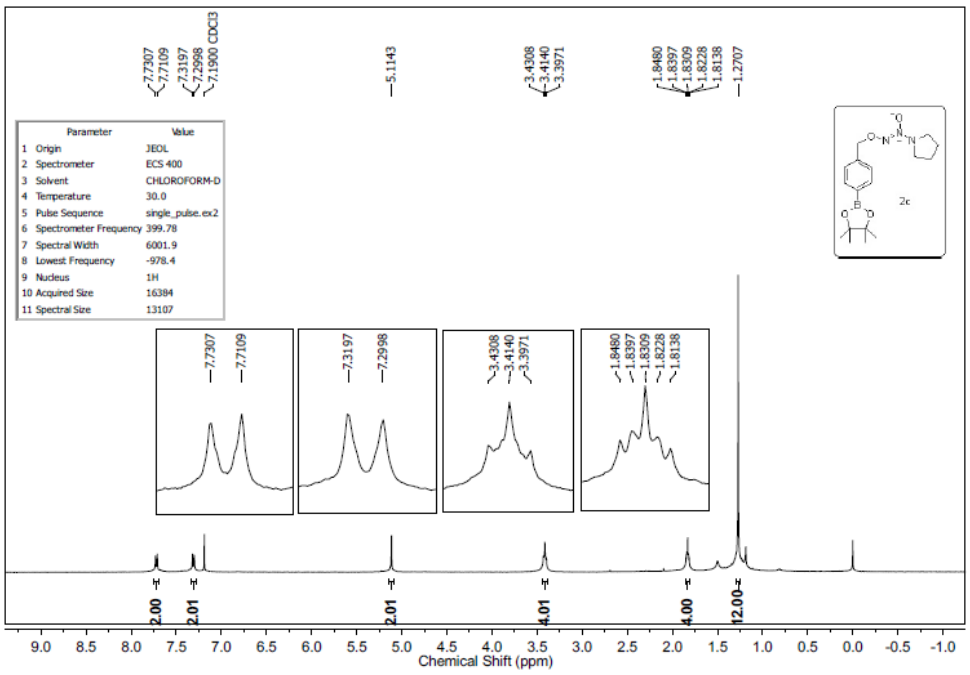
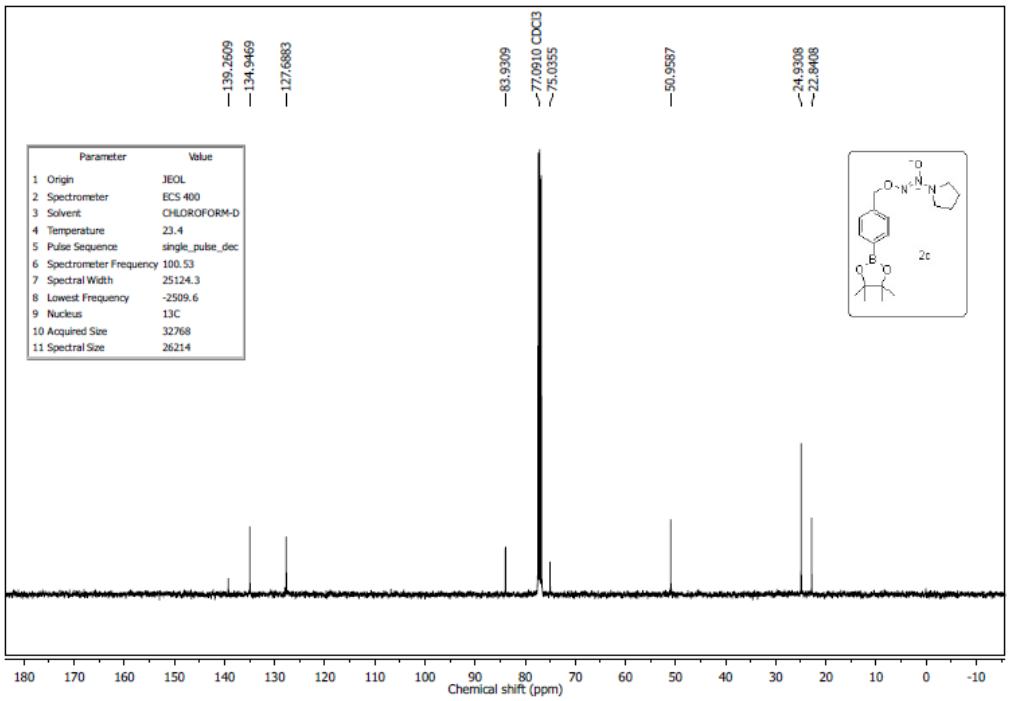
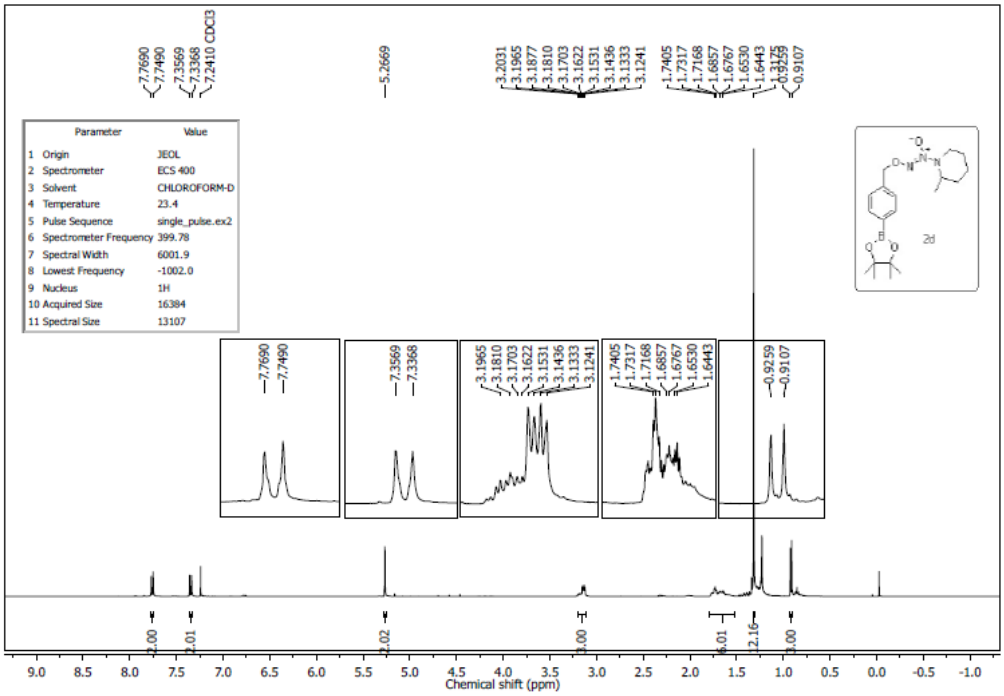


^{13}C NMR of compound **2c**:



^{1}H NMR of compound **2d**:



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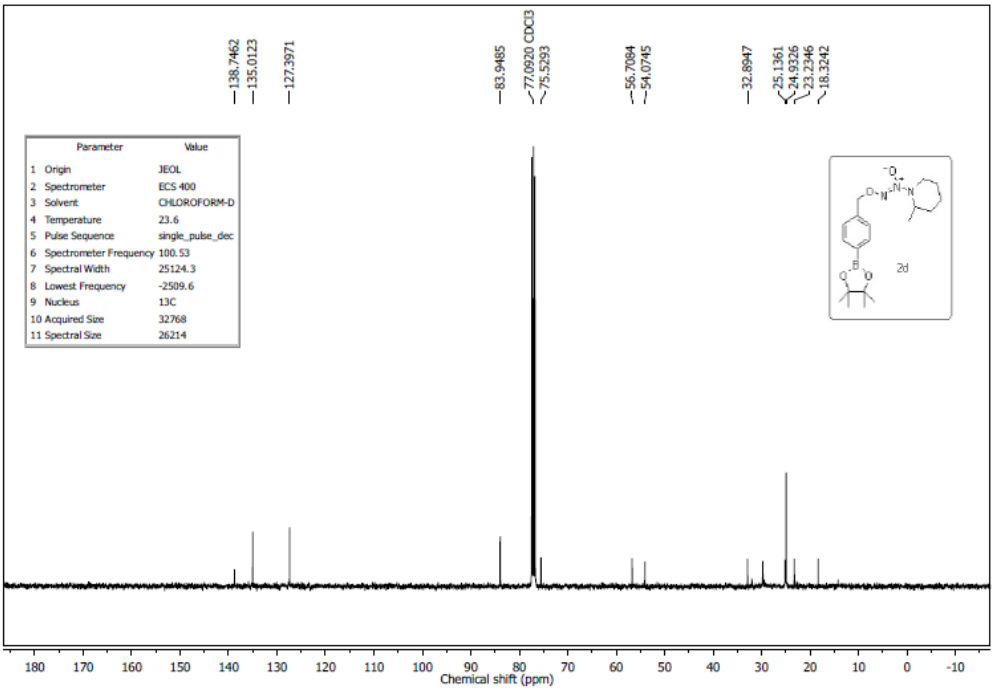

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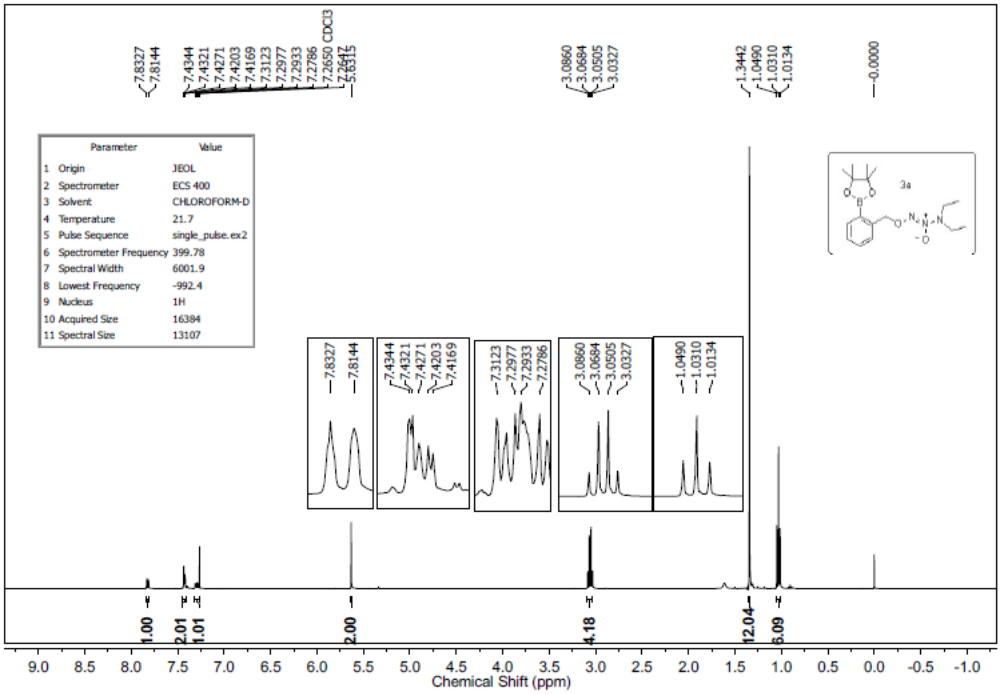

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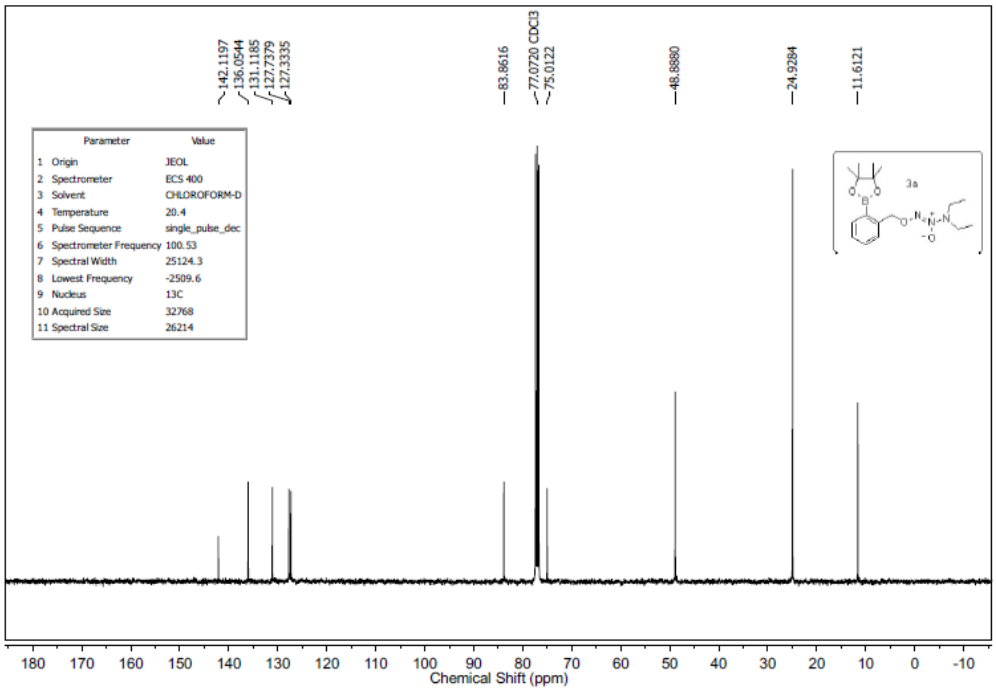

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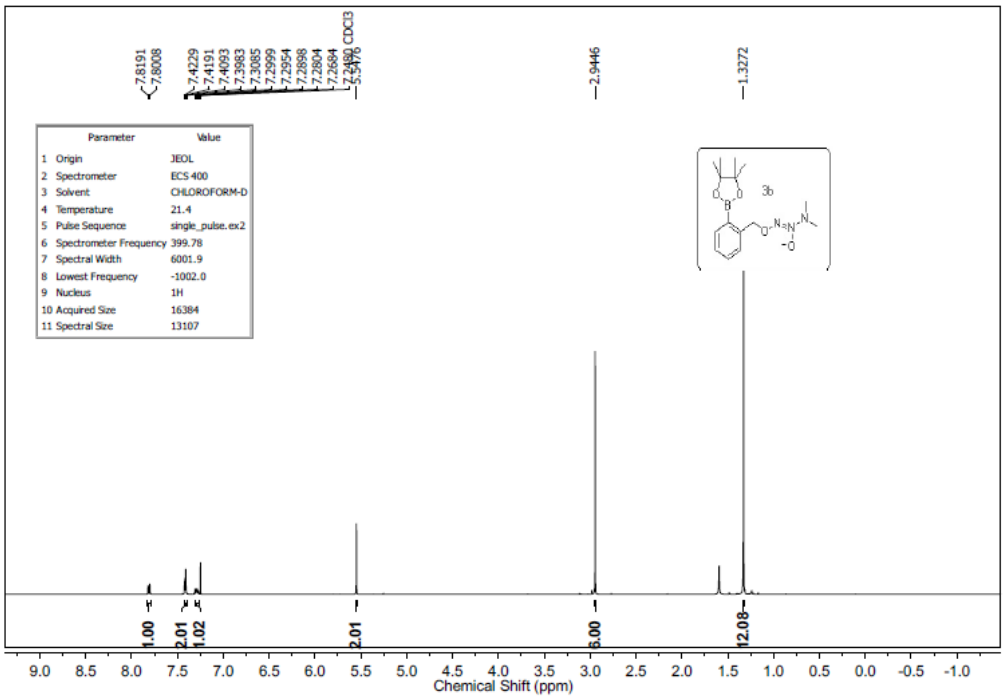

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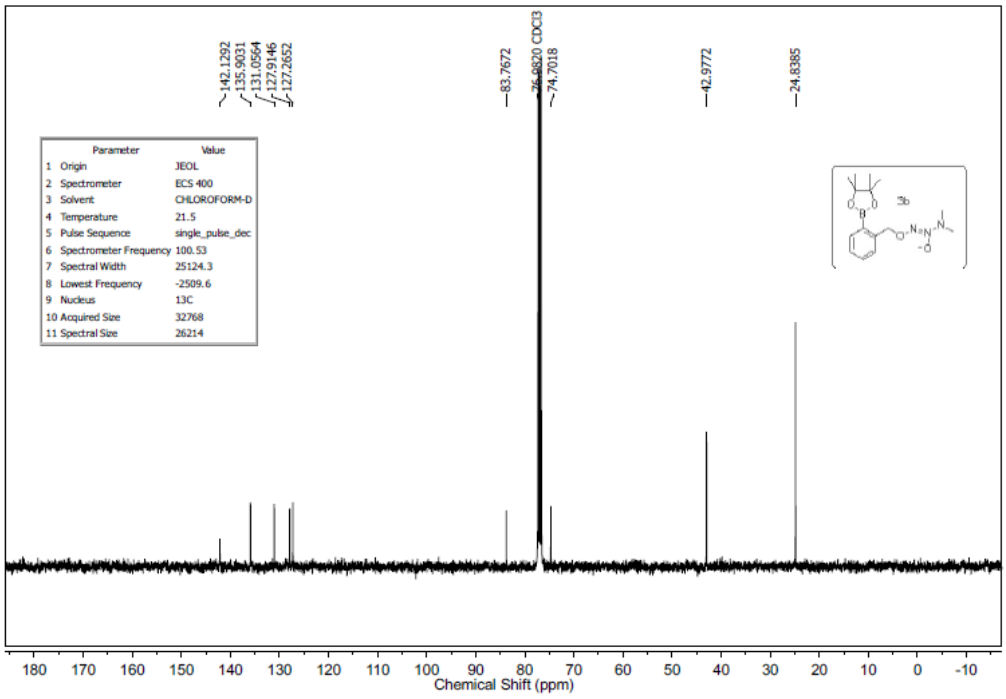

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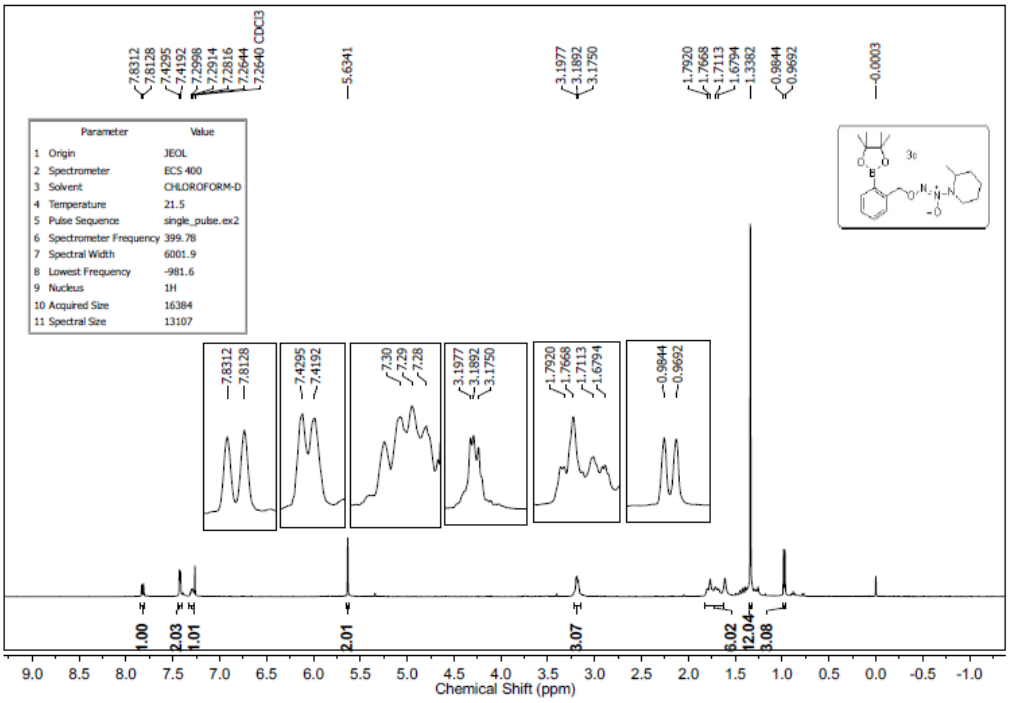

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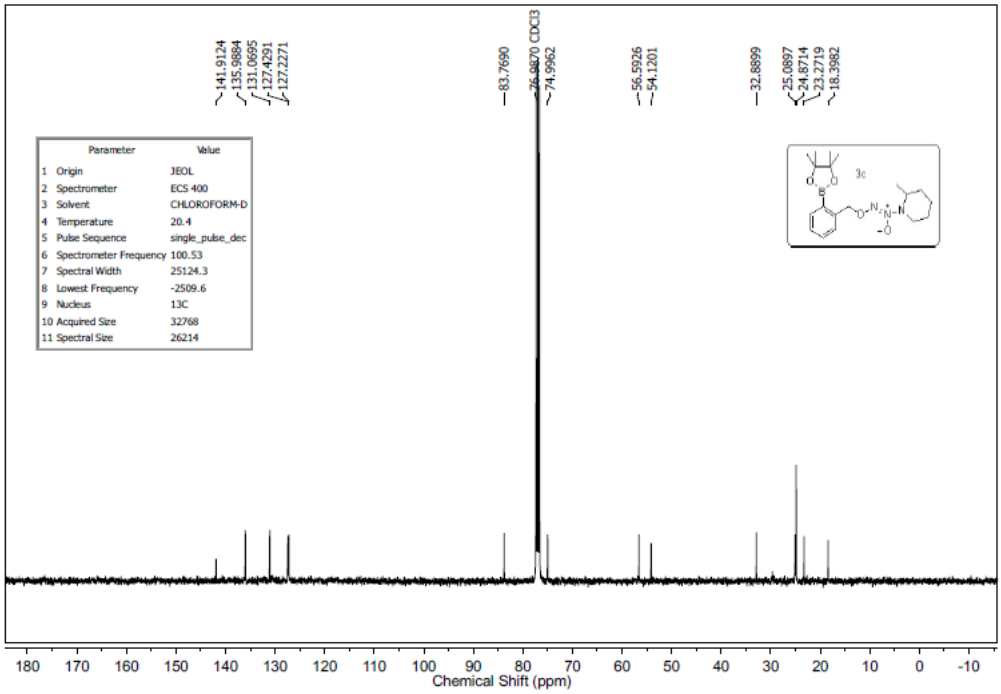

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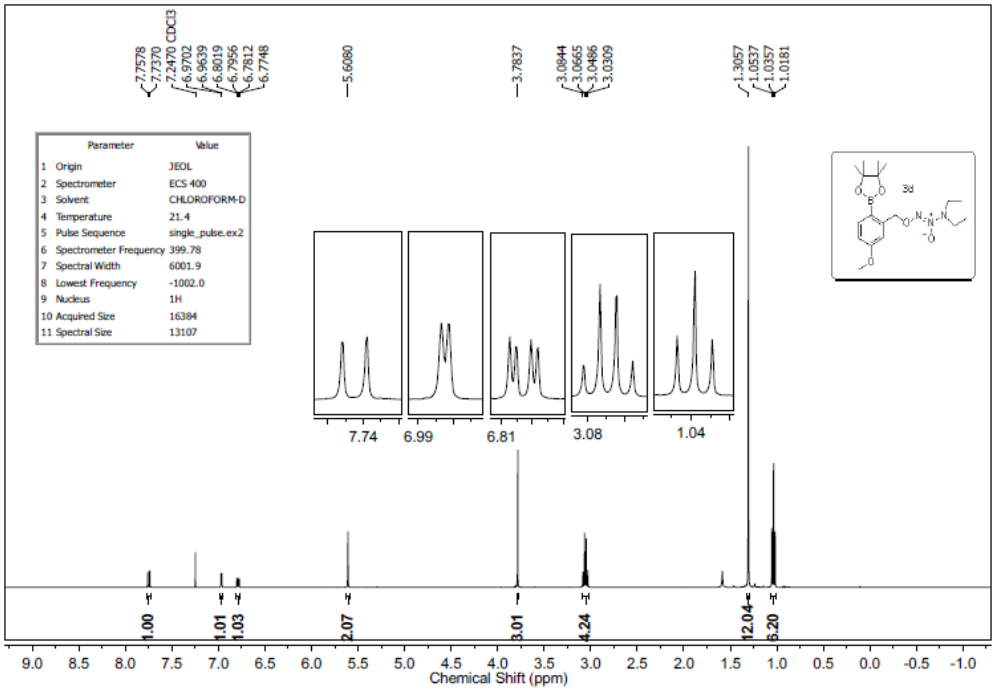

^{13}C NMR of compound **3d**: