Supporting Information

Electron Transfer Promoted Regioselective Ring-Opening Reaction of Cyclopropyl Silyl Ethers

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General Experimental Procedures. NMR spectra were recorded in CDCl₃ with Me₄Si as an internal standard at 200 MHz and 270 MHz for ¹H NMR, and 50 MHz and 68 MHz for ¹³C NMR. Uncorrected melting points are reported. Oxidation and reduction potentials in MeCN were measured with cyclic voltammetry using platinum electrodes as working and counter electrodes, Ag/0.01 M AgNO₃ as a reference electrode, and 0.1 M Et₄NClO₄ as a supporting electrolyte at the scan rate of 100 mV/s. Sample solutions were purged with N₂ before measurements. Ferrocene was used as a reference.¹ Reported standard potentials of ferrocene/ferrocenium couple against Ag/AgNO₃ and SCE were employed.² Then, peak potentials of cyclopropyl silyl ethers were

converted to those against SCE. Half-wave potentials were obtained from these peak potentials by subtracting or adding 0.029 V (see below).³ Photoreactions were conducted in a Pyrex test tube (1.5 cm diameter) immersed in a water bath at room temperature with either a 500 W Xe–Hg lamp as a light source. Column chromatography was performed with silica gel (Wakogel C-200). Preparative TLC was performed on 20 cm x 20 cm plates coated with silica gel (Wakogel B-5F). MeCN was distilled over P₂O₅ and subsequently with K₂CO₃. Tris-*p*-bromophenylammonium hexachloroantimonate was prepared according to the literature procedure.⁴ 9,10-dicyanoanthracene and biphenyl were purchased and recrystallized twice from pyridine and ethanol, respectively. Other reagents and solvents were purchased and used without further purification.

Preparations of cyclopropyl silyl ethers. Compound **1a** could be prepared from 2-methyl-1-tetralone, that is obtained through several steps described in Scheme 1, either by method A⁵ or method B⁶ described in Scheme 2 and Scheme 3, respectively. Compounds **1b**, **1c** and **1d** were similarly prepared by method A. Known compound **18** was prepared according to the literature procedure.⁷ Experimental details will be reported in a full paper.

Scheme 1

Scheme 2 (method A)

Scheme 3 (method B)

Spectral data of **1a**, **1b**, **1c** and **1d** are reported below.

6-Methyl-1-trimethylsilyloxy-2,3-benzobicyclo[4.1.0]heptane (1a): colorless oil; IR (Neat) 2920, 2848, 1290, 886 cm⁻¹; ¹H-NMR (270 MHz) δ 0.25 (s, 9H), 0.86 (d, *J* = 5.7 Hz, 1H), 1.25 (d, *J* = 5.9 Hz, 1H), 1.37 (s, 3H), 1.59 (td, *J* = 13.0, 5.9 Hz, 1H), 1.91 (dd, *J* = 13.0, 5.9 Hz, 1H), 2.40 (td, *J* = 15.9, 5.9 Hz, 1H), 2.58 (dd, *J* = 15.9, 4.9 Hz, 1H), 6.98–7.01 (m, 1H), 7.04–7.10 (m, 1H), 7.18–7.23 (m, 1H), 7.51–7.54 (m, 1H); ¹³C NMR (68 MHz) δ 1.5, 19.8, 22.0, 25.7, 26.6, 27.4, 60.9, 124.7, 125.0, 125.8, 128.0, 133.0, 140.9. LRMS (EI) *m/z* (relative intensity) 246 (M⁺, 40), 73 (100).

7-Methyl-1-trimethylsilyloxy-2,3-benzobicyclo[5.1.0]octane (1b): colorless oil; IR (Neat) 2936,

2860, 864, 842 cm^{-1} ; $^1\text{H-NMR}$ (270 MHz) δ -0.02 (s, 9H), 0.28-0.41 (m, 1H), 0.69 (d, J = 5.1 Hz, 1H), 0.81 (d, J = 5.1 Hz, 1H), 1.22 (s, 3H), 1.33-1.46 (m, 1H), 1.76 (dd, J = 14.3, 5.7 Hz, 1H), 1.85-2.00 (m, 1H), 2.54 (dd, J = 13.0, 4.9 Hz, 1H), 3.05-3.15 (m, 1H), 7.08-7.11 (m, 1H), 7.19-7.23 (m, 2H), 7.41-7.44 (m, 1H); $^{13}\text{C NMR}$ (68 MHz) δ 1.4, 15.7, 21.2, 22.9, 26.3, 30.1, 32.5, 62.9, 125.9, 127.8, 128.3, 129.6, 140.1, 140.8. LRMS (EI) m/z (relative intensity) 260 (M^+ , 8), 73 (100).

6-(3'-butenyl)-1-trimethylsilyloxy-2,3-benzobicyclo[4.1.0]heptane (1c): colorless oil; IR (Neat) 2948, 2920, 1252, 838 cm^{-1} ; $^1\text{H-NMR}$ (270 MHz) δ 0.27 (s, 9H), 0.91 (d, J = 5.9 Hz, 1H), 1.27 (d, J = 5.1 Hz, 1H), 1.45-1.89 (m, 3H), 2.12 (ddd, J = 13.0, 6.2, 1.9 Hz, 1H), 2.15-2.42 (m, 3H), 2.65 (dd, J = 16.2, 3.5 Hz, 1H), 4.96-5.10 (m, 2H), 5.85-6.00 (m, 1H), 7.02-7.05 (m, 1H), 7.08-7.14 (m, 1H), 7.21-7.26 (m, 1H), 7.51-7.54 (m, 1H); $^{13}\text{C NMR}$ (68 MHz) δ 1.5, 21.2, 23.6, 27.3, 29.4, 31.5, 32.4, 60.9, 114.1, 124.7, 125.1, 126.0, 127.9, 133.0, 139.1, 141.0. LRMS (EI) m/z (relative intensity) 286 (M^+ , 7), 83 (100).

6-(4'-pentenyl)-1-trimethylsilyloxy-2,3-benzobicyclo[4.1.0]heptane (1d): colorless oil; IR (Neat) 2920, 2852, 1252, 838 cm^{-1} ; $^1\text{H-NMR}$ (270 MHz) δ 0.25 (s, 9H), 0.86 (d, J = 6.2 Hz, 1H), 1.23 (d, J = 6.2 Hz, 1H), 1.48-1.73 (m, 5H), 1.98 (ddd, J = 11.0, 6.1, 2.0 Hz, 1H), 2.08-2.15 (m, 2H), 2.40 (td, J = 16.0, 6.2 Hz, 1H), 2.62 (ddd, J = 16.1, 5.3, 1.9 Hz, 1H), 4.94-5.07 (m, 2H), 5.77-5.92 (m, 1H), 7.00-7.03 (m, 1H), 7.05-7.11 (m, 1H), 7.19-7.25 (m, 1H), 7.49-7.52 (m, 1H); $^{13}\text{C NMR}$ (68 MHz) δ 1.5, 21.2, 23.6, 26.5, 27.3, 29.6, 32.5, 34.3, 61.0, 114.4, 124.7, 125.0, 125.9, 127.9, 133.0, 138.9, 141.0. LRMS (EI) m/z (relative intensity) 300 (M^+ , 87), 231 (100).

Reaction of cyclopropyl silyl ethers with tris-*p*-bromophenylaminium hexachloroantimonate (TBPA), To a solution of **1** (0.40 mmol) in MeCN (8 mL) was added TBPA (0.81 mmol) under N_2 . The resulting mixture was stirred until the consumption of **1** was confirmed by TLC analysis, 2 h for **1a** and **1b**, 1 h for **1c**, and then it was concentrated. The residue was dissolved in CH_2Cl_2 and followed by filtration. The filtrate was concentrated and subjected to column chromatography using $\text{CH}_2\text{Cl}_2/n\text{-C}_6\text{H}_{14}$ (1/1) to give the mixture of **2a** and **3a**. Formation of **3a** was confirmed by comparing its $^1\text{H-NMR}$ with that of **3a** obtained in FeCl_3 promoted reaction of **1a**.⁸ Subsequently, without separation, this mixture was dissolved in MeOH (8.0 mL) with NaOAc (2.0 mmol) and refluxed for 2 h. After addition of water, the resulting mixture was extracted with Et_2O . The extract was treated with sat. aqueous NaHCO_3 , sat. aqueous NaCl , and dried over anhydrous MgSO_4 and then concentrated. The residue was subjected to TLC ($\text{CH}_2\text{Cl}_2/n\text{-C}_6\text{H}_{14}$ = 1/2) and enone **2** was obtained. Same treatment of **18** with TBPA gave the complicated mixture. Spectral data of **2a**, **2b**, **2c** and **3a** are described below.

3-methyl-2,3-2H benzosuberone (2a): colorless oil; IR (Neat) 1642, 1304 cm^{-1} ; $^1\text{H-NMR}$ (270 MHz) δ 2.01 (s, 3H), 2.54 (t, J = 6.0 Hz, 2H), 3.04 (t, J = 6.0 Hz, 2H), 6.23 (s, 1H), 7.15-7.18 (m, 1H), 7.29-7.32 (m, 1H), 7.36-7.42 (m, 1H), 7.73-7.76 (m, 1H); $^{13}\text{C NMR}$ (68 MHz) δ 27.0, 33.7, 34.8, 126.4, 128.2, 129.1, 129.3, 131.6, 139.0, 139.4, 158.6, 192.9. LRMS (EI) m/z (relative

intensity) 172 (M^+ , 61), 129 (100). HRMS (EI) calcd for $C_{12}H_{12}O$ 172.0888, found 172.0888.

3-methyl-7,8-benzocyclooct-2-en-1-one (2b): pale yellow oil; IR (Neat) 1620, 1304 cm^{-1} ; ^1H -NMR (200 MHz) δ 1.76-1.86 (m, 2H), 2.00 (s, 3H), 2.14 (t, $J = 6.5$ Hz, 2H), 2.83 (t, $J = 6.3$ Hz, 2H), 6.44-6.46 (m, 1H), 7.09-7.13 (m, 1H), 7.25-7.32 (m, 1H), 7.37-7.41 (m, 1H), 7.64-7.68 (m, 1H); ^{13}C NMR (50 MHz) δ 26.8, 29.0, 29.9, 30.5, 126.5, 129.0, 129.5, 131.6, 132.3, 139.0, 142.0, 154.3, 190.7. LRMS (EI) m/z (relative intensity) 186 (M^+ , 94), 158 (100). HRMS (EI) calcd for $C_{13}H_{14}O$ 186.1045, found 186.1048.

3-(3'-butenyl)-2,3-2H benzosuberone (2c): colorless oil; IR (Neat) 1638, 1304 cm^{-1} ; ^1H -NMR (200 MHz) δ 2.22-2.39 (m, 4H), 2.54 (t, $J = 5.9$ Hz, 2H), 3.03 (t, $J = 5.9$ Hz, 2H), 4.95-5.09 (m, 1H), 5.68-5.86 (m, 1H), 6.21-6.22 (m, 1H), 7.14-7.17 (m, 1H), 7.25-7.43 (m, 2H), 7.75-7.80 (m, 1H); ^{13}C NMR (50 MHz) δ 31.9, 33.6, 34.1, 40.0, 115.5, 126.7, 128.5, 129.4, 129.6, 131.9, 136.9, 139.1, 139.9, 161.4, 193.3. LRMS (EI) m/z (relative intensity) 212 (M^+ , 36), 128 (100). HRMS (EI) calcd for $C_{15}H_{16}O$ 212.1201, found 212.1197.

3-chloro-3-methyl-2,3-benzosuberone (3a):⁸ white solid: mp 56.2-60.3 $^{\circ}C$; IR (Nujol) 1676, 758 cm^{-1} ; ^1H -NMR (200 MHz) δ 1.78 (s, 3H), 2.02 (ddd, $J = 15.4, 10.3, 1.2$ Hz, 1H), 2.55 (ddt, $J = 15.4, 8.1, 1.2$ Hz, 1H), 3.05 (dd, $J = 17.0, 7.9$ Hz, 1H), 3.12 (dd, $J = 11.7, 1.4$ Hz, 1H), 3.41 (dd, $J = 17.8, 10.8$ Hz, 1H), 3.53 (d, $J = 11.7$ Hz, 1H), 7.24-7.46 (m, 3H), 7.79 (m, 1H); ^{13}C NMR (50 MHz) δ 31.4, 32.4, 44.9, 57.6, 69.3, 126.6, 129.0, 130.3, 132.0, 137.8, 143.8, 198.0. LRMS (CI) m/z (relative intensity) 208 (M^+ , 69), 210 ($M+2$, 22), 118 (100%)

Photoreaction of cyclopropyl silyl ethers with 9,10-dicyanoanthracene (DCA) and biphenyl (BP). A solution of **1** (0.40 or 0.10 mmol), DCA (0.04 or 0.01 mmol) and BP (0.48 or 0.12 mmol) in an appropriate volume (4 or 1 mL) of solvent (MeCN, MeOH, 1,4-cyclohexadiene) in the presence or absence of $Cu(OAc)_2$ (0.48 mmol) was purged with N_2 for 10 min prior to irradiation. The resulting mixture was irradiated with the light ($\lambda > 340$ nm) using a cut-off glass-filter for an appropriate irradiation time. While a photolysate was usually concentrated, a photolysate containing $Cu(OAc)_2$ was subjected to the extraction with Et_2O and water. Organic layer was treated with water, sat. aqueous $NaHCO_3$, sat. aqueous $NaCl$, and dried over anhydrous $MgSO_4$ and then concentrated. In both cases, the residues were subjected to TLC separation to obtain unreacted **1** and products. When column separation using $n-C_6H_{14}$ was performed before TLC, it was possible to recover BP (above ~90%). Characterization of product **5** was previously reported.² Because purification of photo-produced **6** (2 : 1 mixture of two diastereomers, isomer **6a** and **6b**) could not be completed, **6** (**6a** : **6b** = 1 : 2) was independently obtained by the hydrogenation of **17** using H_2 -Pd/C. Photoreaction of **18** was similarly performed. Product **19** is a known compound.⁷ Spectral data of products **4**, **6**, **15**, **16**, and **17** are described below.

3-Propyl-3-methyl-1-indanone (4): pale yellow oil; IR (Neat) 1604 cm^{-1} ; ^1H -NMR (270 MHz) δ 0.85 (t, $J = 7.1$ Hz, 3H), 0.89-1.01 (m, 1H), 1.21-1.33 (m, 1H), 1.41 (s, 3H), 1.43-1.75 (m, 2H),

2.44 (d, $J = 18.9$ Hz, 1H), 2.68 (d, $J = 18.9$ Hz, 1H), 7.33-7.39 (m, 1H), 7.44–7.47 (m, 1H), 7.58-7.64 (m, 1H), 7.68-7.71 (m, 1H); ^{13}C NMR (68 MHz) δ 14.6, 18.4, 28.4, 42.1, 44.7, 50.3, 123.2, 123.7, 127.3, 134.7, 135.9, 162.8, 205.9. LRMS (EI) m/z (relative intensity) 188 (M^+ , 72), 145 (100). HRMS (EI) calcd for $\text{C}_{13}\text{H}_{16}\text{O}$ 188.1201, found 188.1206.

1-Benzosuberone-3-spiro-2'-methylcyclopentane (6): colorless oil: IR (Neat) 2944, 1676 cm^{-1} ; ^1H -NMR (270 MHz) δ 0.94 (d, $J = 6.8$ Hz, 3H, **6a**), 0.97 (d, $J = 6.5$ Hz, 3H, **6b**), 1.26-2.00 (m, 9H), 2.49 (d, $J = 12.2$ Hz, 1H, **6b**), 2.62 (d, $J = 11.9$ Hz, 1H, **6a**), 2.83-3.14 (m, 3H), 7.19-7.29 (m, 2H), 7.34–7.40 (m, 1H), 7.78-7.86 (m, 1H); ^{13}C NMR (68 MHz) δ 15.2 (**6a**), 15.5 (**6b**), 20.8 (**6a**). 21.2 (**6b**), 32.4 (**6a**), 32.7 (**6b**), 38.4, 39.1 (**6a**), 39.7 (**6b**), 44.2 (**6a**), 45.2 (**6b**), 45.7 (**6a**), 46.0 (**6b**), 47.2, 53.4, 126.1, 128.5 (**6b**), 128.7 (**6a**), 130.0 (**6b**), 130.1 (**6a**), 131.6, 138.6, 143.9 (**6b**), 144.8 (**6a**), 202.5 (**6a**), 203.6 (**6b**). LRMS (EI) m/z (relative intensity) 228 (M^+ , 70), 210 (100). HRMS (EI) calcd for $\text{C}_{16}\text{H}_{20}\text{O}$ 228.1514, found 228.1521.

2,2-Dimethyl-1-tetralone (15): colorless oil: IR (Neat) 1684 cm^{-1} ; ^1H -NMR (200 MHz) δ 1.22 (s, 6H), 1.98 (t, $J = 6.3$ Hz, 2H), 2.98 (t, $J = 6.3$ Hz, 2H), 7.20-7.33 (m, 2H), 7.41–7.49 (m, 1H), 8.02-8.06 (m, 1H); ^{13}C NMR (50 MHz) δ 24.3, 25.7, 36.6, 41.6, 126.5, 127.9, 128.6, 131.4, 132.9, 143.3, 202.9. LRMS (EI) m/z (relative intensity) 174 (M^+ , 59), 118 (100). HRMS (EI) calcd for $\text{C}_{12}\text{H}_{12}\text{O}$ 174.1045, found 174.1047.

1-Tetralone-2-spiro-3'-cyclopentylidene (16): colorless oil: IR (Neat) 1680, 1600 cm^{-1} ; ^1H -NMR (270 MHz) δ 1.67-1.77 (m, 1H), 2.04-2.59 (m, 6H), 2.84-3.07 (m, 3H), 4.89 (broad s, 2H), 7.21-7.33 (m, 2H), 7.50–7.84 (m, 1H), 8.03-8.05 (m, 1H); ^{13}C NMR (68 MHz) δ 26.4, 31.1, 33.6, 34.2, 42.0, 52.9, 106.2, 126.5, 127.8, 128.5, 131.6, 133.0, 143.3, 150.5, 201.1. LRMS (EI) m/z (relative intensity) 212 (M^+ , 39), 197 (100). HRMS (EI) calcd for $\text{C}_{15}\text{H}_{16}\text{O}$ 212.1201, found 212.1197.

1-Benzosuberone-3-spiro-2'-cyclopentylidene (17): colorless oil: IR (Neat) 1676, 1598 cm^{-1} ; ^1H -NMR (270 MHz) δ 1.60-1.84 (m, 5H), 2.04 (dd, $J = 14.6, 8.6$ Hz, 1H), 2.45-2.50 (m, 2H), 2.64 (d, $J = 10.8$ Hz, 1H), 2.93-3.02 (m, 2H), 3.17 (dd, $J = 16.5, 9.5$ Hz, 1H), 4.86 (broad s, 1H), 4.92 (broad s, 1H), 7.22-7.30 (m, 2H), 7.36–7.41 (m, 1H), 7.81-7.84 (m, 1H); ^{13}C NMR (68 MHz) δ 21.9, 32.0, 32.9, 39.4, 40.2, 46.4, 52.1, 104.8, 126.2, 128.7, 130.1, 131.5, 138.3, 144.3, 158.6, 202.0. LRMS (EI) m/z (relative intensity) 226 (M^+ , 87), 131 (100). HRMS (EI) calcd for $\text{C}_{16}\text{H}_{18}\text{O}$ 226.1358, found 226.1354.

Discussion on photoinduced electron transfer processes involving cyclopropyl silyl ethers, DCA and BP. Oxidation potentials ($E^{\text{ox}}_{1/2}$ V vs. SCE) were obtained to be +1.53, +1.80, +1.36, +1.36, and 1.84 for **1a**, **1b**, **1c**, **1d** and **18**, respectively. Reduction potential of the singlet excited state of DCA ($^1\text{DCA}^*$) is reported to be +1.97 on the basis of reduction potential ($E^{\text{red}}_{1/2} = -0.89$ V vs. SCE) and the excitation energy ($E_{00} = 66$ kcal/mol) of DCA.⁹ Therefore, single electron transfer (SET) from **1** and **18** to $^1\text{DCA}^*$ should be feasible. On the other hand, SET from **1a**, **1c** and **1d** to

the radical cation of BP ($\text{BP}^{\bullet+}$) is exoergonic while that from **1b** and **18** to $\text{BP}^{\bullet+}$ are slightly endoergonic on the basis of the reported oxidation potential of BP ($E^{\text{ox}}_{1/2} = +1.77 \text{ V vs. SCE}$).³ However, the radical ion pair generated by SET between electron-donating substrate and $^1\text{DCA}^*$ has a tendency to undergo unproductive back electron transfer to give starting substrate.⁹ Therefore, in the reaction systems reported in this paper, $\text{BP}^{\bullet+}$ appeared to act as more effective catalyst than $^1\text{DCA}^*$ although SET processes for **1b** and **18** with $\text{BP}^{\bullet+}$ are energetically less favorable,

References

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WAVELENGTH CM-1

SAMPLE : HT-97-3
REMARKS : EKIMAKU

PEAK
High W: 4000.0 Low W: 400.0 Level: 60.0 Window: 2.0

No.	WV(CM-1)	RT	No.	WV(CM-1)	RT
1	2944.0	36.0	2	2872.0	51.5
3	2852.0	58.6	4	1620.0	6.1
5	1596.0	19.4	6	1460.0	43.2
7	1444.0	29.6	8	1376.0	44.8
9	1322.0	43.7	10	1304.0	5.6
11	1278.0	27.6	12	1250.0	41.7
13	1156.0	59.1	14	1024.0	40.8
15	880.0	49.4	16	874.0	51.2
17	782.0	32.8	18	758.0	34.6
19	634.0	54.1	20	562.0	40.9

WAVENUMBER CM-1

SAMPLE : HT-119-4
REMARKS : EXIMAKU

PEAK

HIGH WN: 4000.0 LOW WN: 400.0 Level: 65.0 Window: 2.0

No.	WN(cm-1)	%T	No.	WN(cm-1)	%T
1	3064.0	56.4	2	2916.0	41.3
3	2848.0	54.8	4	1638.0	18.4
5	1596.0	32.5	6	1450.0	40.5
7	1418.0	53.7	8	1304.0	24.2
9	1230.0	63.6	10	1160.0	64.1
11	1114.0	57.8	12	1038.0	59.6
13	994.0	57.4	14	966.0	64.9
15	916.0	50.8	16	882.0	60.6
17	768.0	54.4	18	750.0	45.0
19	630.0	64.8			

6 (photo product)

6 (H₂-Pd/C product)

6 (H₂-Pd/C product)

OBSERVE

Nucleus 13.000 Hz
 Spec. Width 4392.5 Hz
 Acq. Time 1.081 sec
 File Width 10.5 sec

Freq. 50 MHz
 Offset 0 Hz
 Delay 2.000 sec
 Transmits 128

DECOUPLE

Nucleus 1.000 Hz
 Mode YTY
 Modulation Mode S
 File Width 23.0 sec

Offset -300.0 Hz
 Power 20.0 dB
 Freq. 10500 Hz
 Power Mode 1.0

PLOT/PROCESSING

File 32 X RE --- sec CD --- sec
 LG 1.000 Hz AC --- sec CD --- sec
 Width 1063.9 Hz/ptm Start -503.3 Hz/ppm
 Reference ---

EXPERIMENT

Pulse Sequence S201L
 Tube O.D. --- mm
 Temp. --- °C
 Solvent CDCl3

SAINT E
 ET-2.0-4

Number ---
 File C
 Date 01-07-97
 X-GEN 200

OBSERVE		NUC1		FREQ		NUC2	
Pulse Width 13.000		He		50		He	
Spec Width 5622.5		He		-1525.9		He	
Acq Time 1.000		sec		Delay 2.000		sec	
Pulse Width 21.5		μsec		Transmit 64			
DECOUPLE		NUC1		FREQ		NUC2	
Pulse Width 23.0		μsec		Power Mode 1.0			
MODE		MODE		POWER		FREQ	
Modulation Mode QCS		NMR		20.0		10000	
		He		db		He	
PLOT/PROCESSING		F1		K		RE	
Reference		32		He		He	
Waltz 5622.5		He		He		He	
He/gpm		814.2		He/gpm			
EXPERIMENT		Pulse Sequence DEPT		TUBE Q.D.		mm	
Solvent CDCl3		Temp		°C			
SAMPLE		ET-243-4		F1		DEPT	
Date 01-08-97		Operator 03:27:56		XL GEN 200			

SAMPLE : ET-243-4
REMARKS : NEAT

PEAK
High Wavenumber: 4000.0 Low Wavenumber: 400.0 Level: 70.0 Wavenumber: 1.0

No.	Wavenumber (cm ⁻¹)	Int.	No.	Wavenumber (cm ⁻¹)	Int.
1	2960.0	53.6	2	2924.0	50.0
3	1684.0	12.9	4	1602.0	51.1
5	1472.0	65.3	6	1454.0	50.5
7	1384.0	54.3	8	1300.0	41.4
9	1218.0	38.7	10	970.0	58.0
11	740.0	36.3			