Appendices

Appendix I

Chemical synthesis

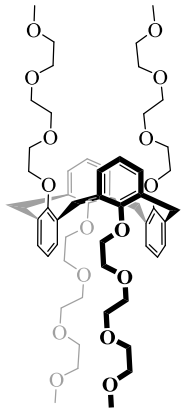
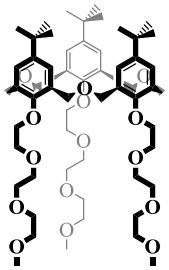
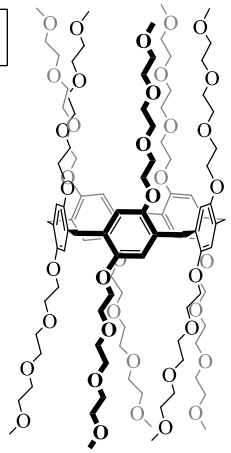
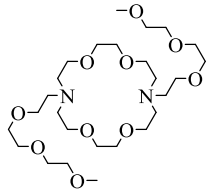
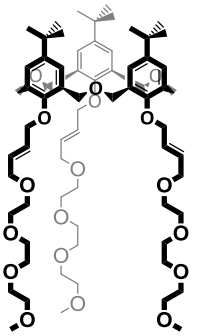
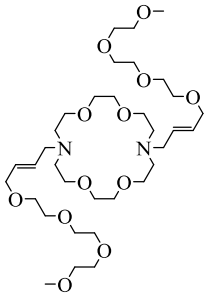
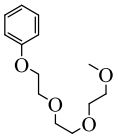
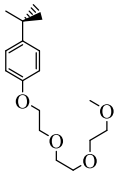
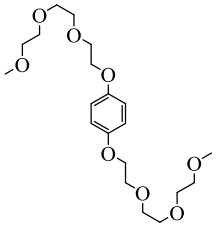
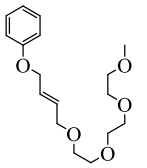
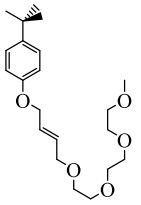
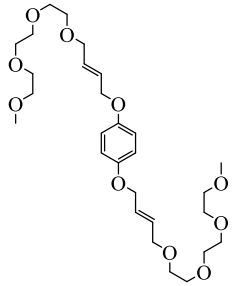
8 	**9** 	**10** 
11 	**12** 	**13** 
14 	**15** 	**16** 
17 	**18** 	**19** 

Table A1-1: Chemical structures of compounds **8-19**, whose ion channel activities and antimicrobial properties were assessed.

Triethyleneglycol tosylate monomethyl ether

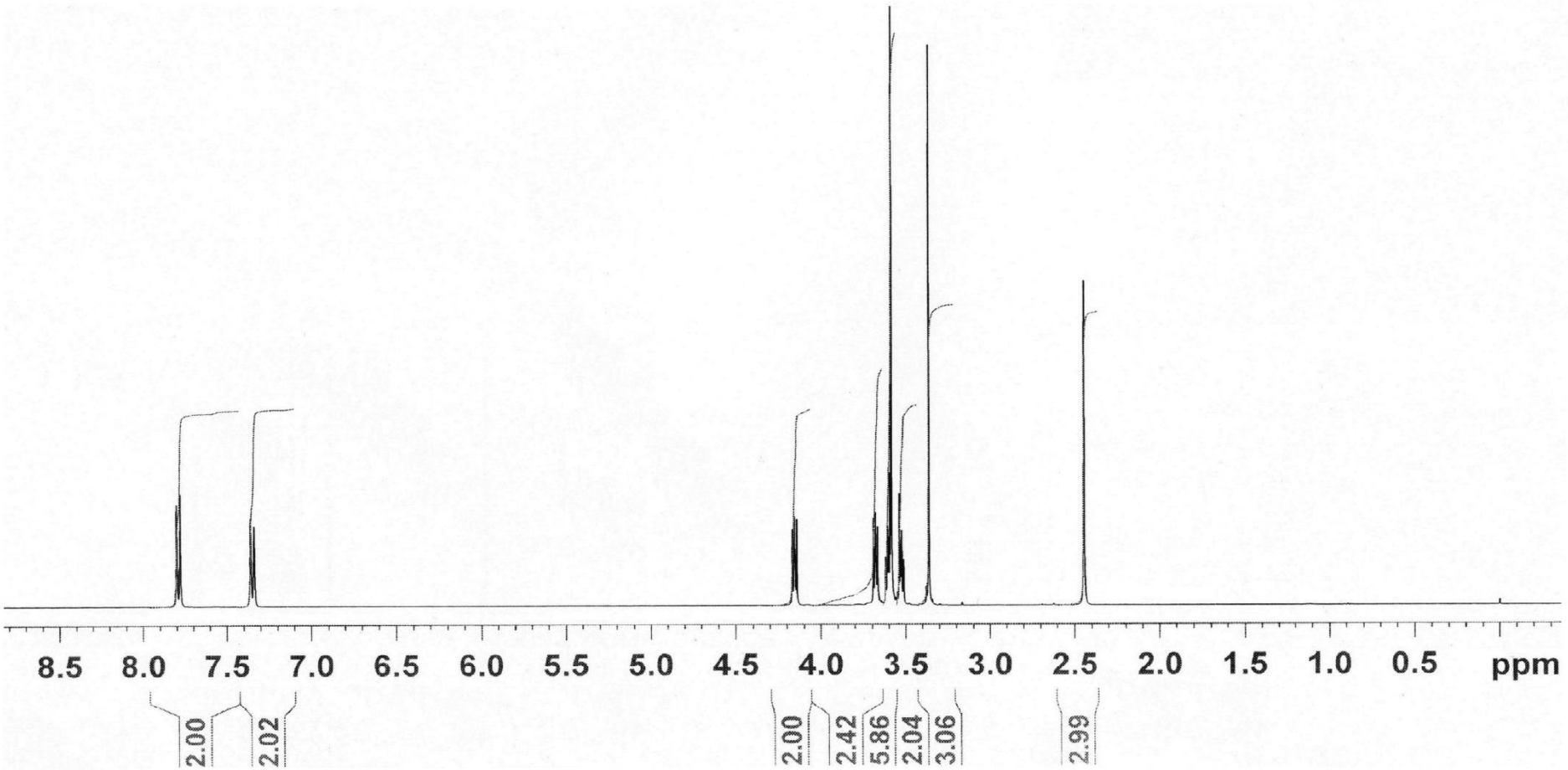


Figure A1 - 1(a): ^{1}H NMR spectra of **1** conducted in $CDCl_3$.

Triethyleneglycol tosylate monomethyl ether

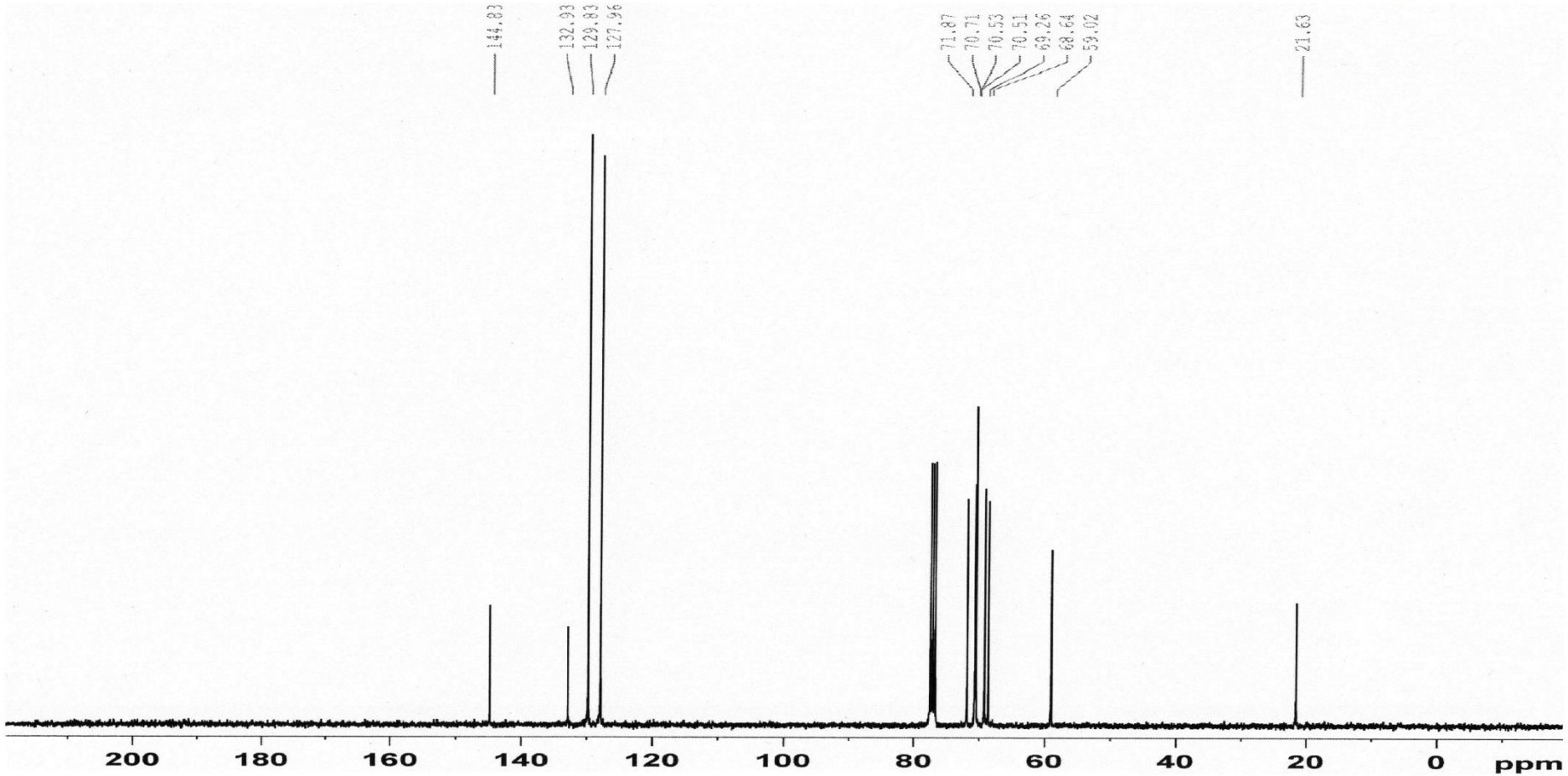


Figure A1 - 1(b): ^{13}C NMR spectra of **1** conducted in $CDCl_3$.

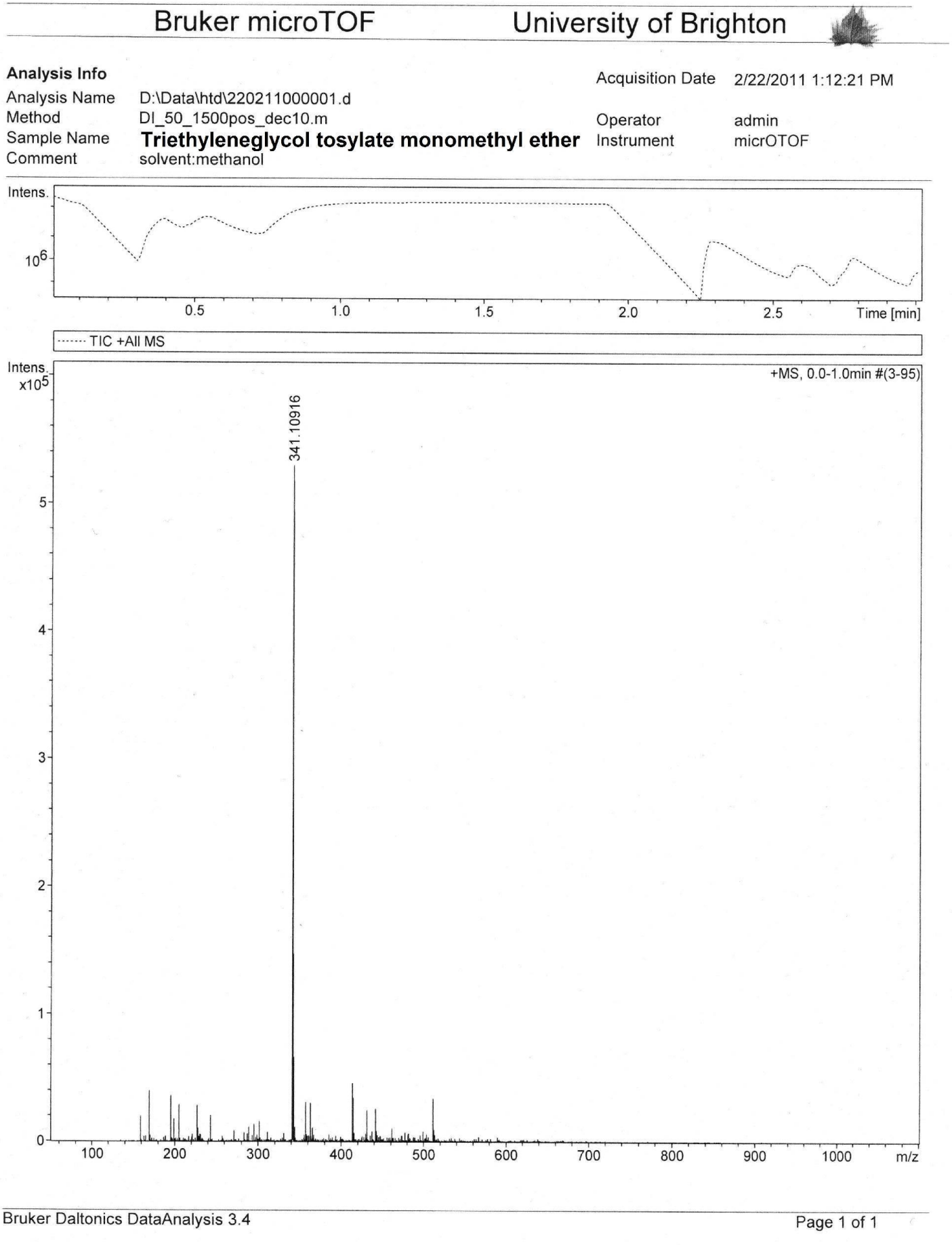


Figure A1 - 1(c): Mass spectra of **1** conducted in methanol.

(E)-15-bromo-2,5,8,11-tetraoxapentadec-13-ene

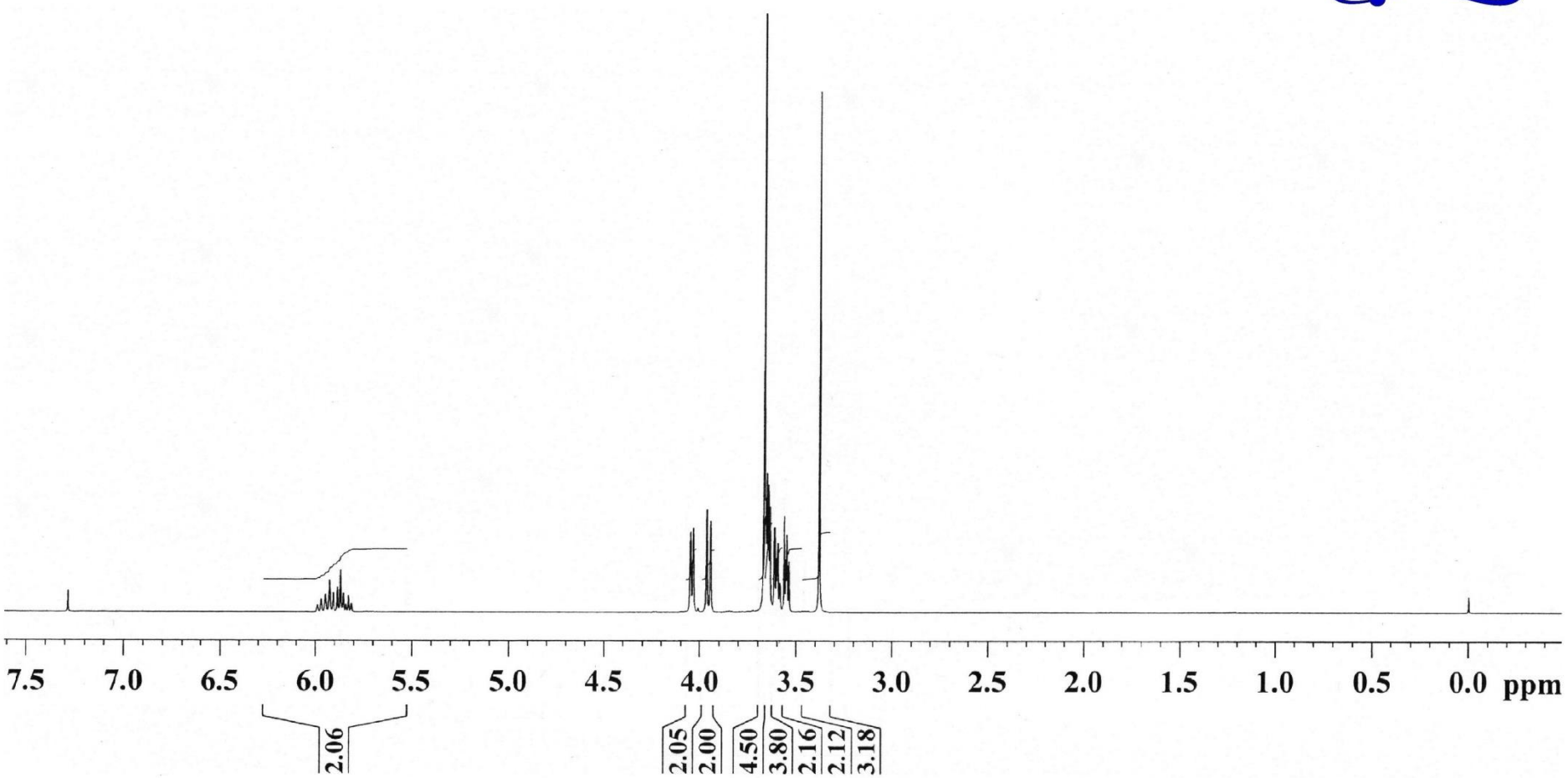


Figure A1 - 2(a): ^{1}H NMR spectra of **2** conducted in $CDCl_3$.

(E)-15-bromo-2,5,8,11-tetraoxapentadec-13-ene

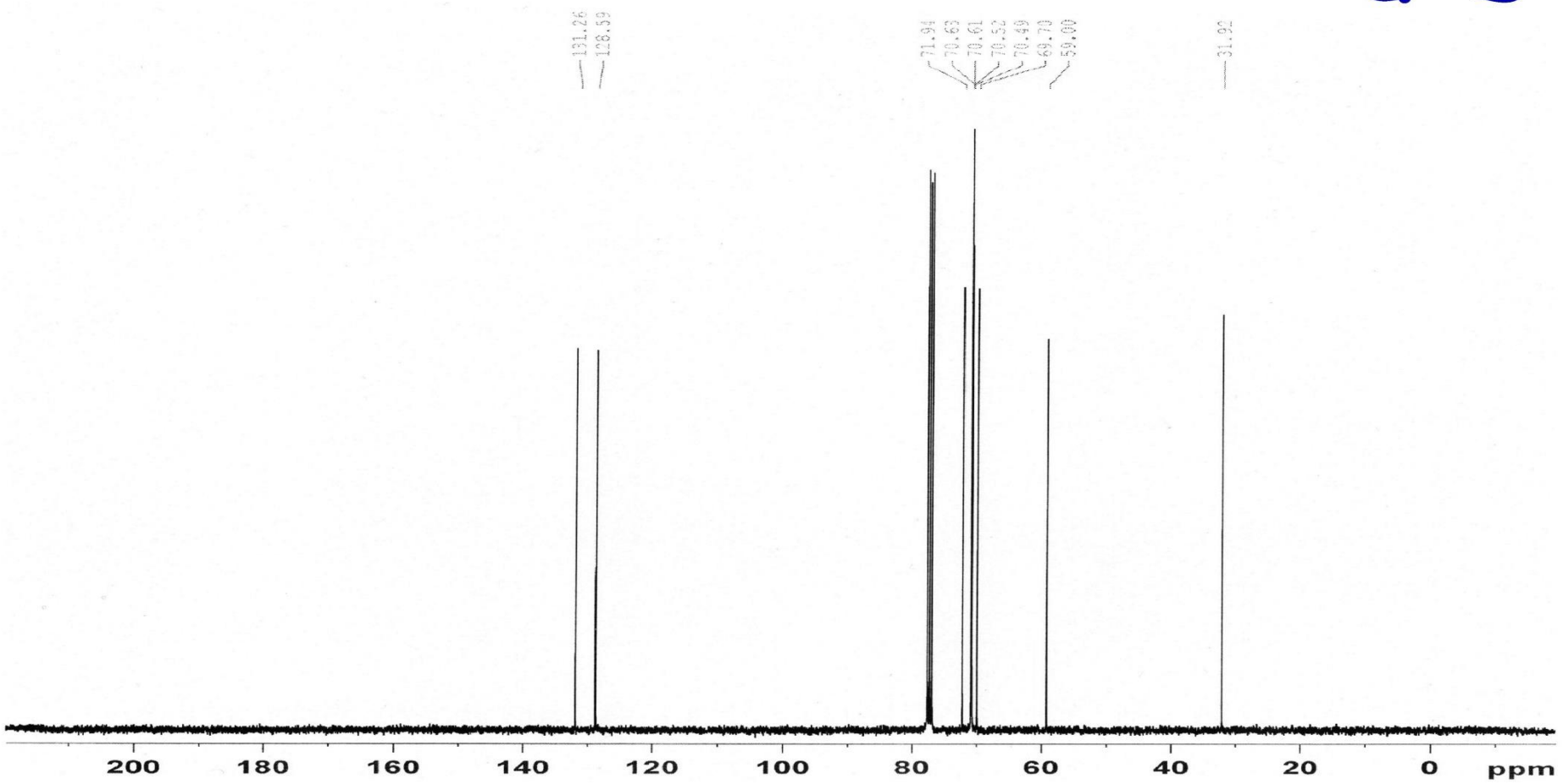


Figure A1 - 2(b): ^{13}C NMR spectra of **2** conducted in $CDCl_3$.

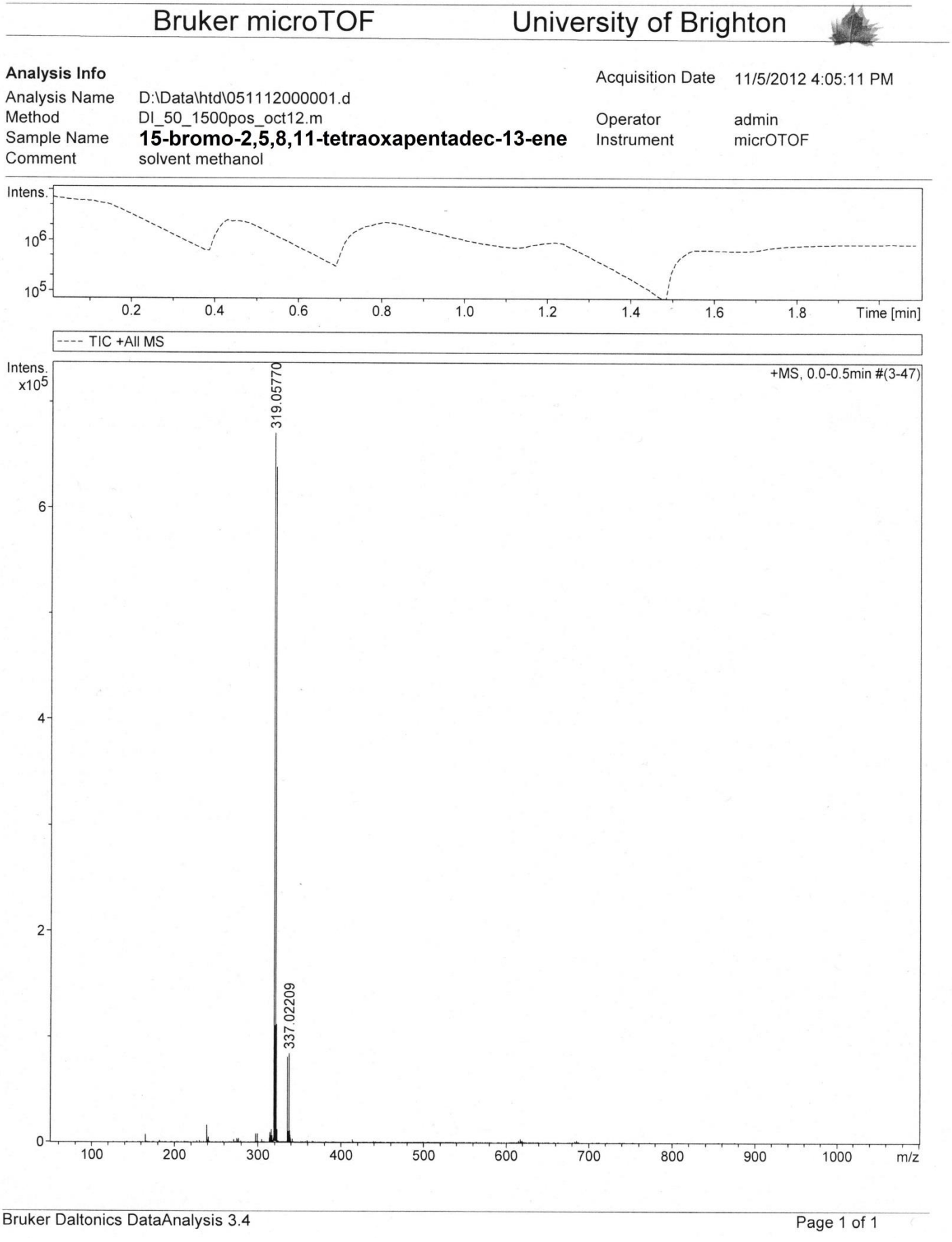


Figure A1 - 2(c): Mass spectra of **2** conducted in methanol.

Calix[4]arene

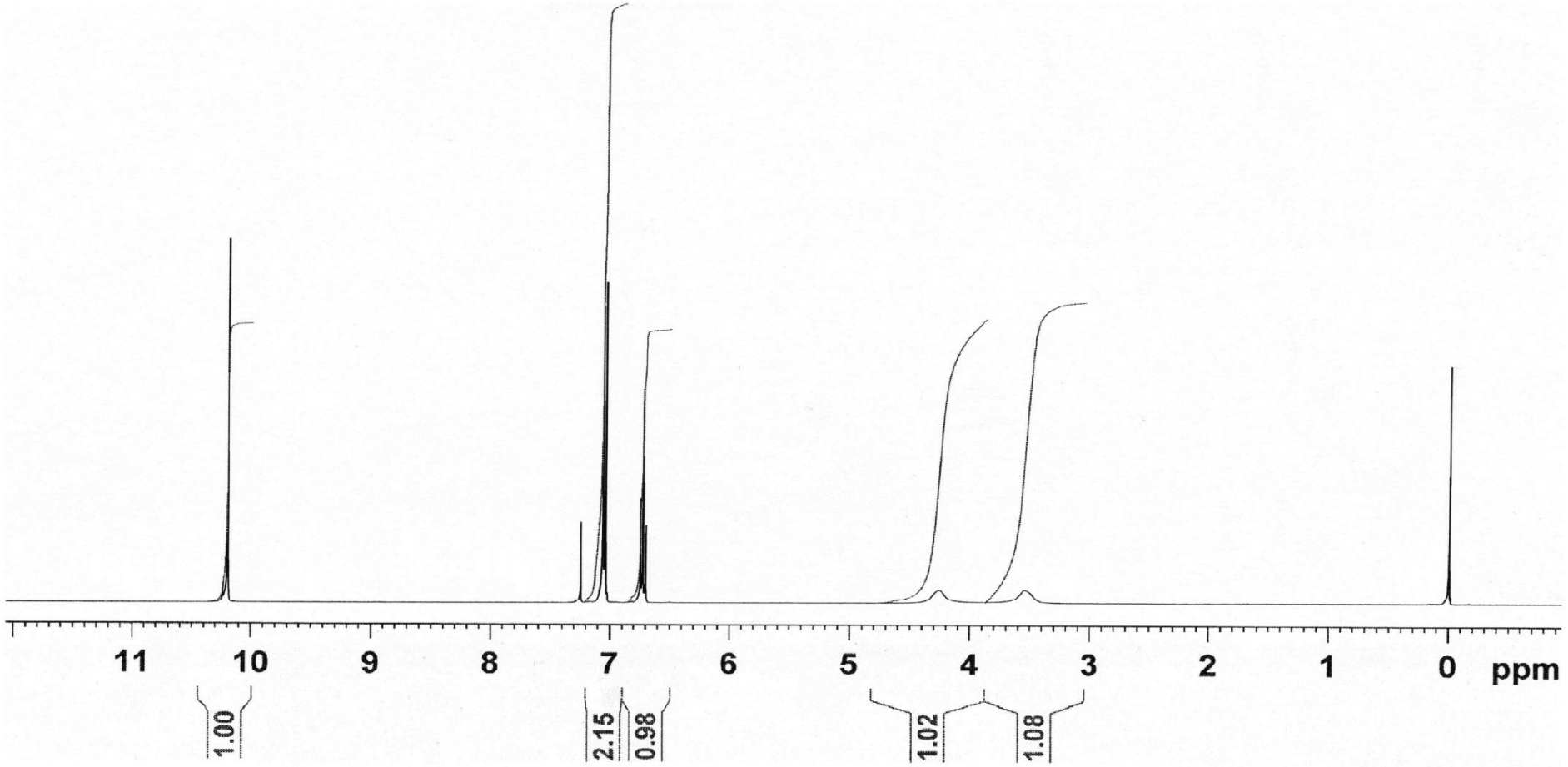


Figure A1 - 3(a): ^{1}H NMR spectra of **3** conducted in $CDCl_3$.

Calix[4]arene

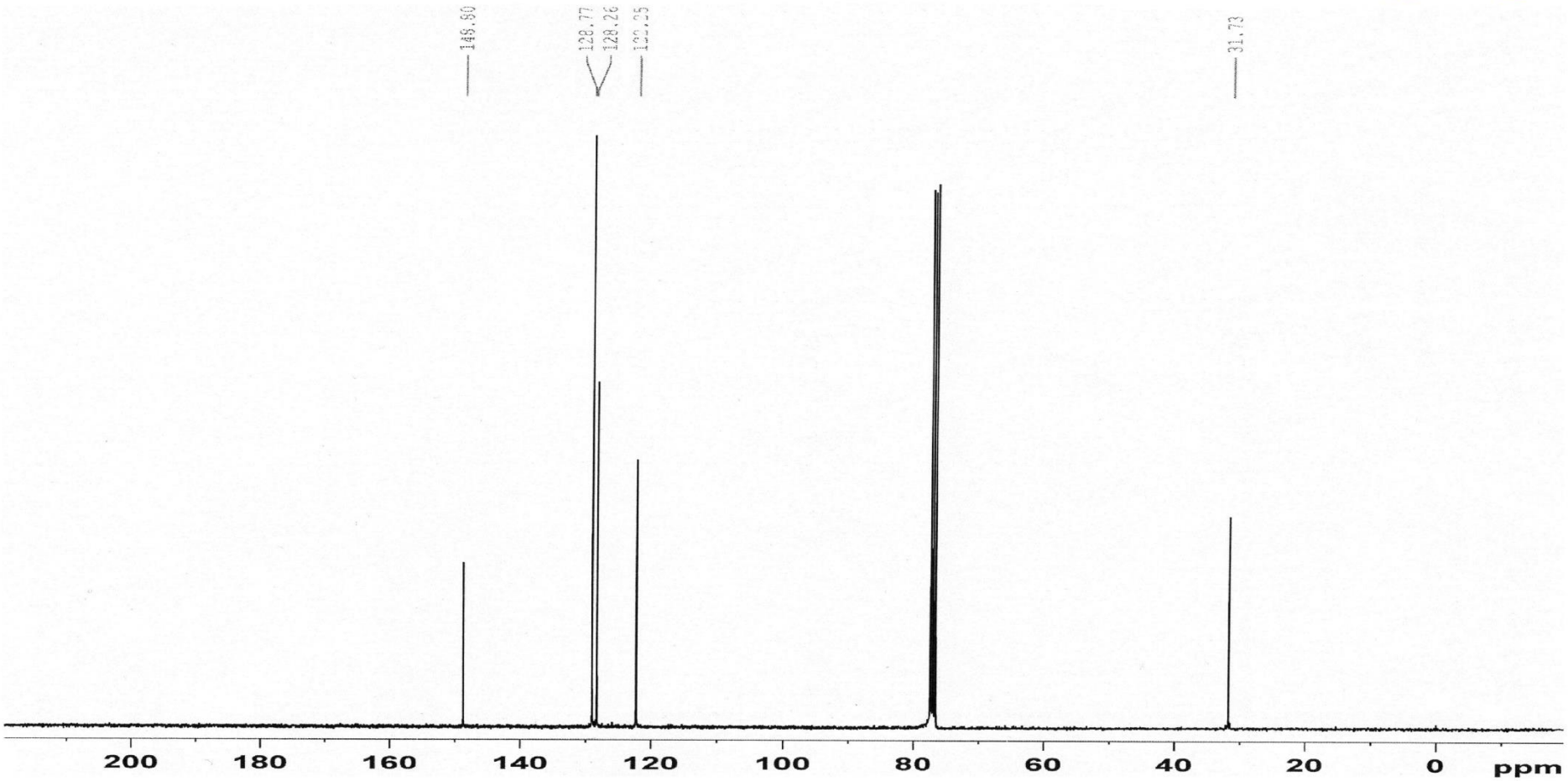


Figure A1 - 3(b): ^{13}C NMR spectra of **3** conducted in $CDCl_3$.

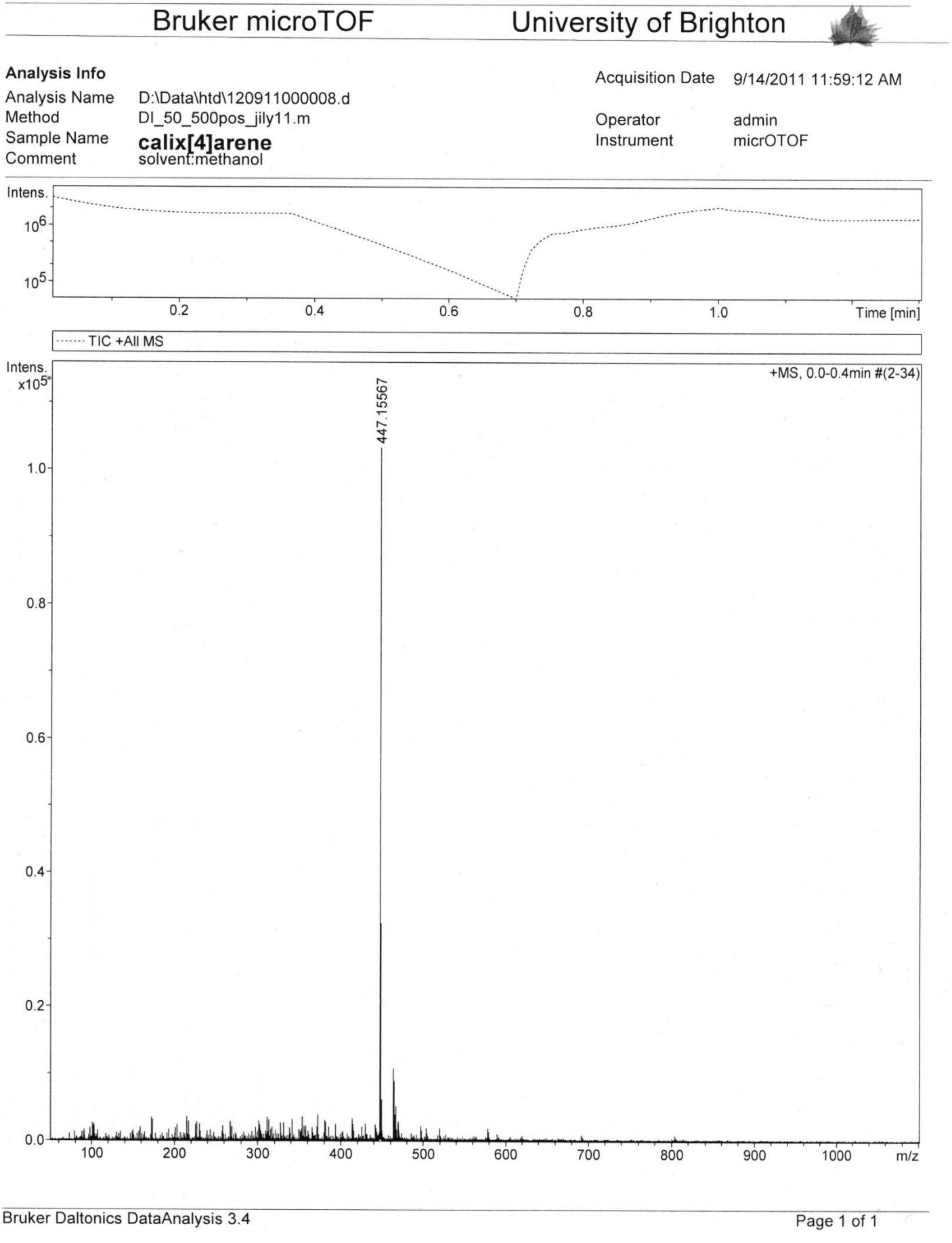


Figure A1 - 3(c): Mass spectra of **3** conducted in methanol.

2,6-Bis(hydroxymethyl)-4-t-butylphenol

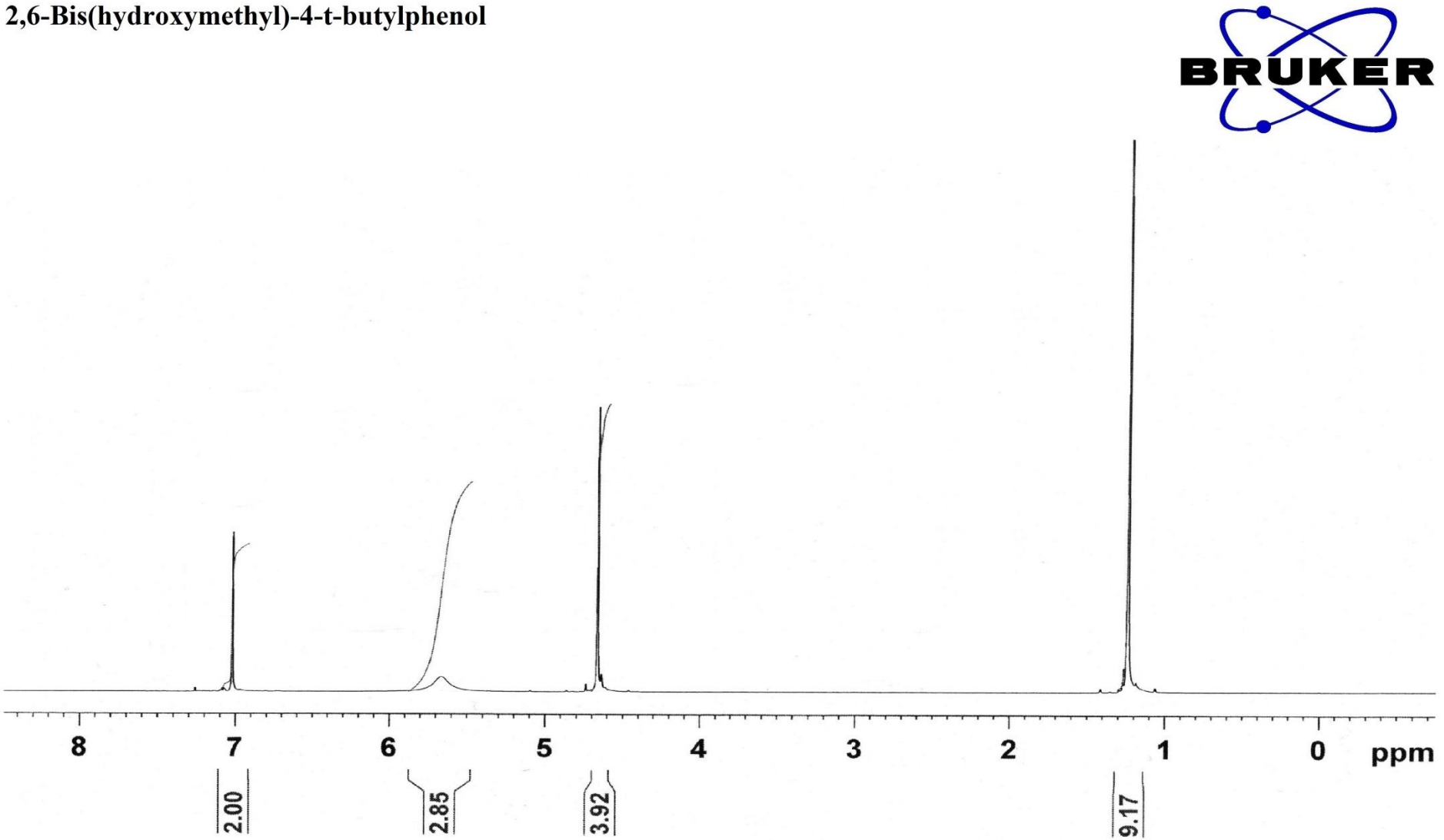


Figure A1 - 4(a): ^{1}H NMR spectra of **4** conducted in $CDCl_3$.

2,6-Bis(hydroxymethyl)-4-t-butylphenol

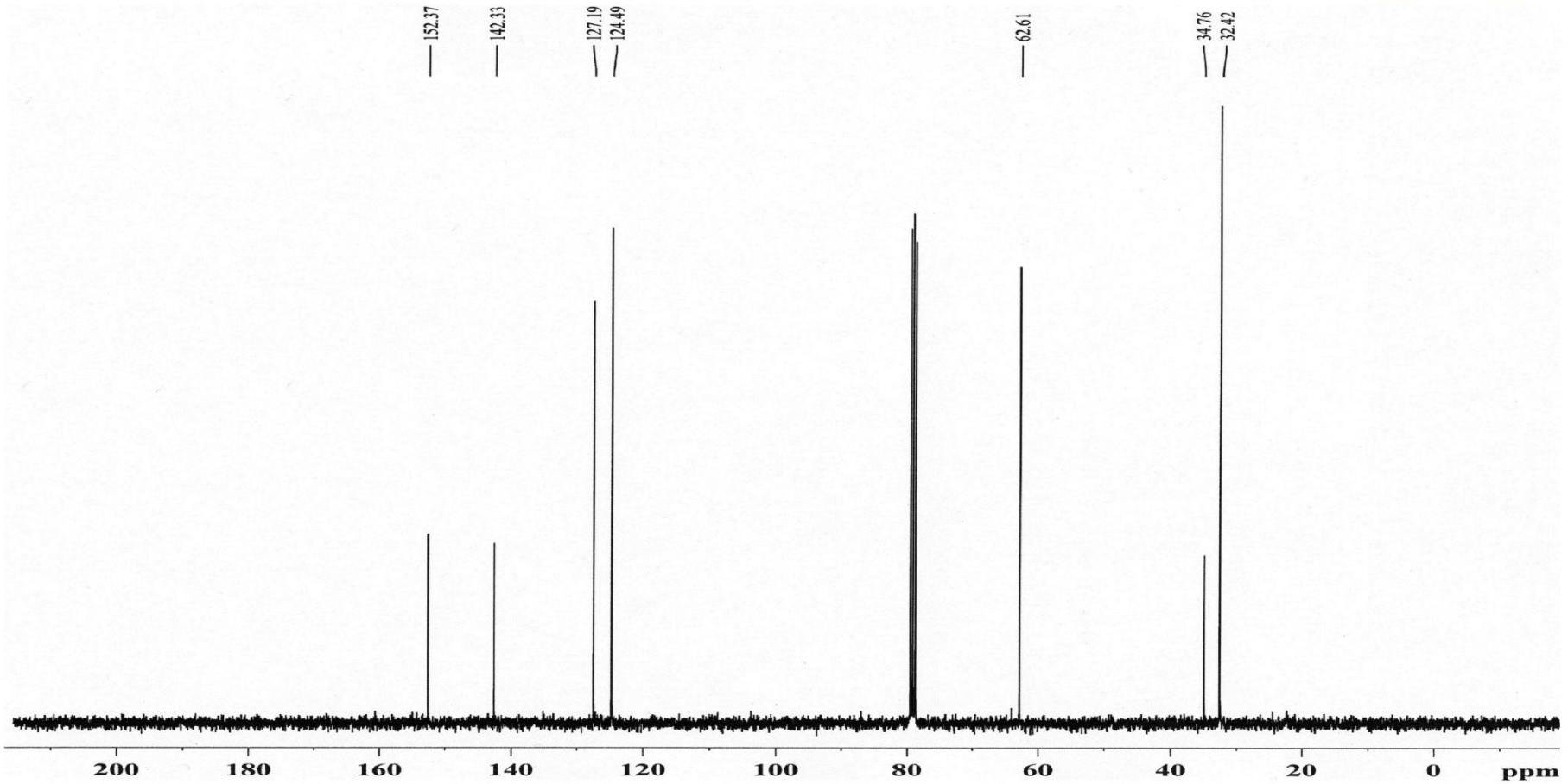


Figure A1 - 4(b): ^{13}C NMR spectra of **4** conducted in $CDCl_3$.

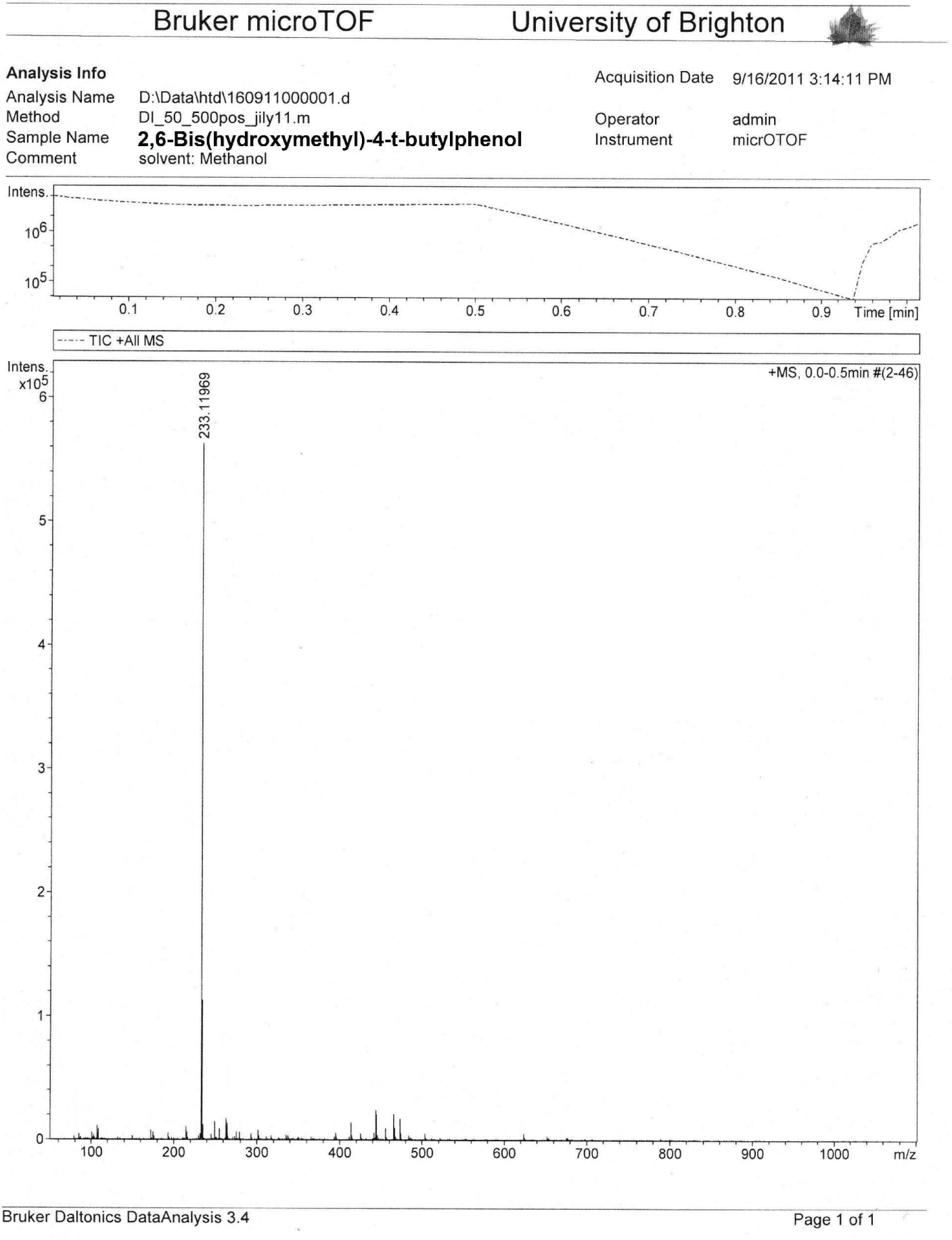


Figure A1 - 4(c): Mass spectra of **4** conducted in methanol.

4-t-Butyloxacalix[3]arene

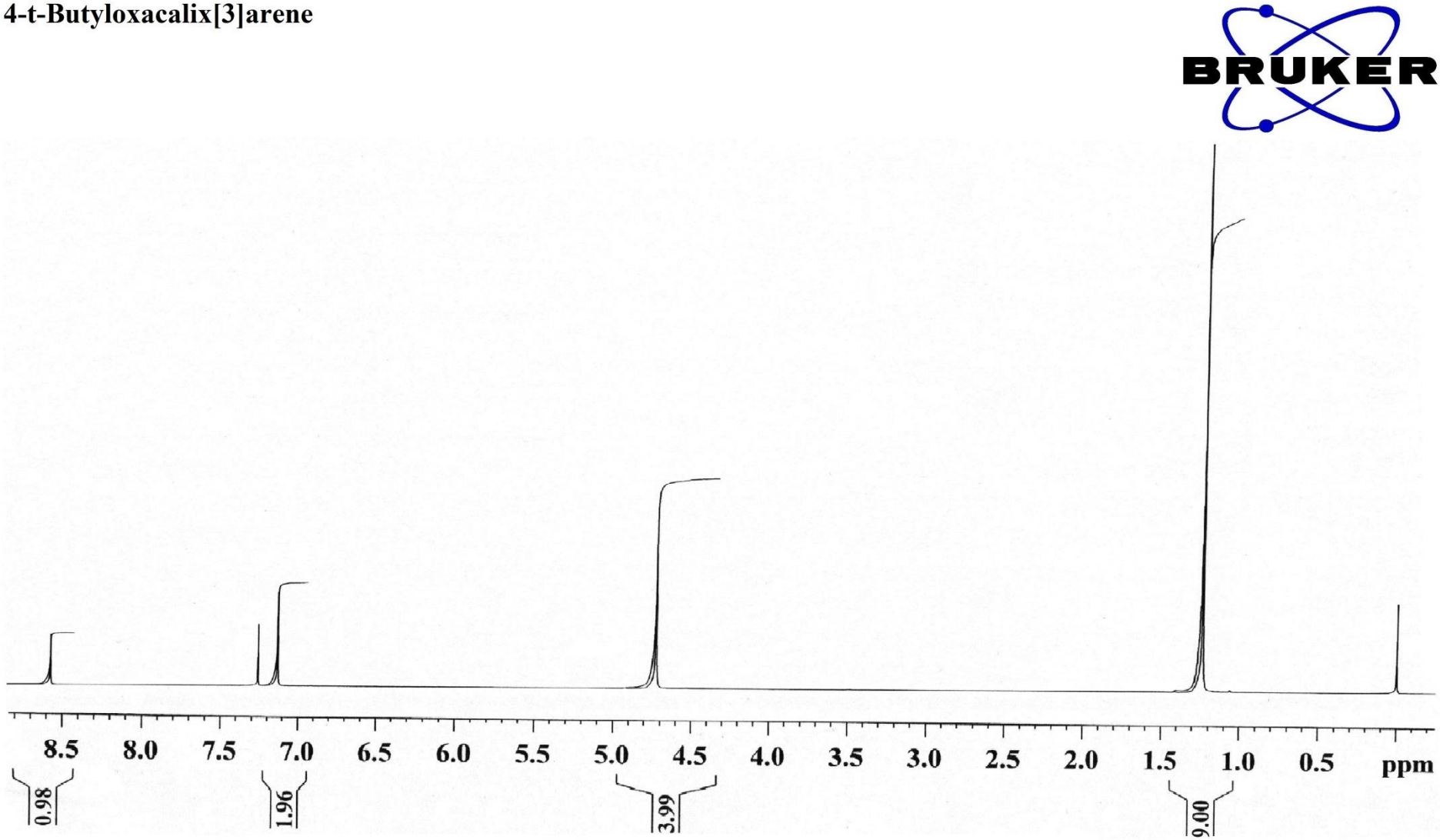


Figure A1 - 5(a): ^{1}H NMR spectra of **5** conducted in $CDCl_3$.

4-t-Butyloxacalix[3]arene

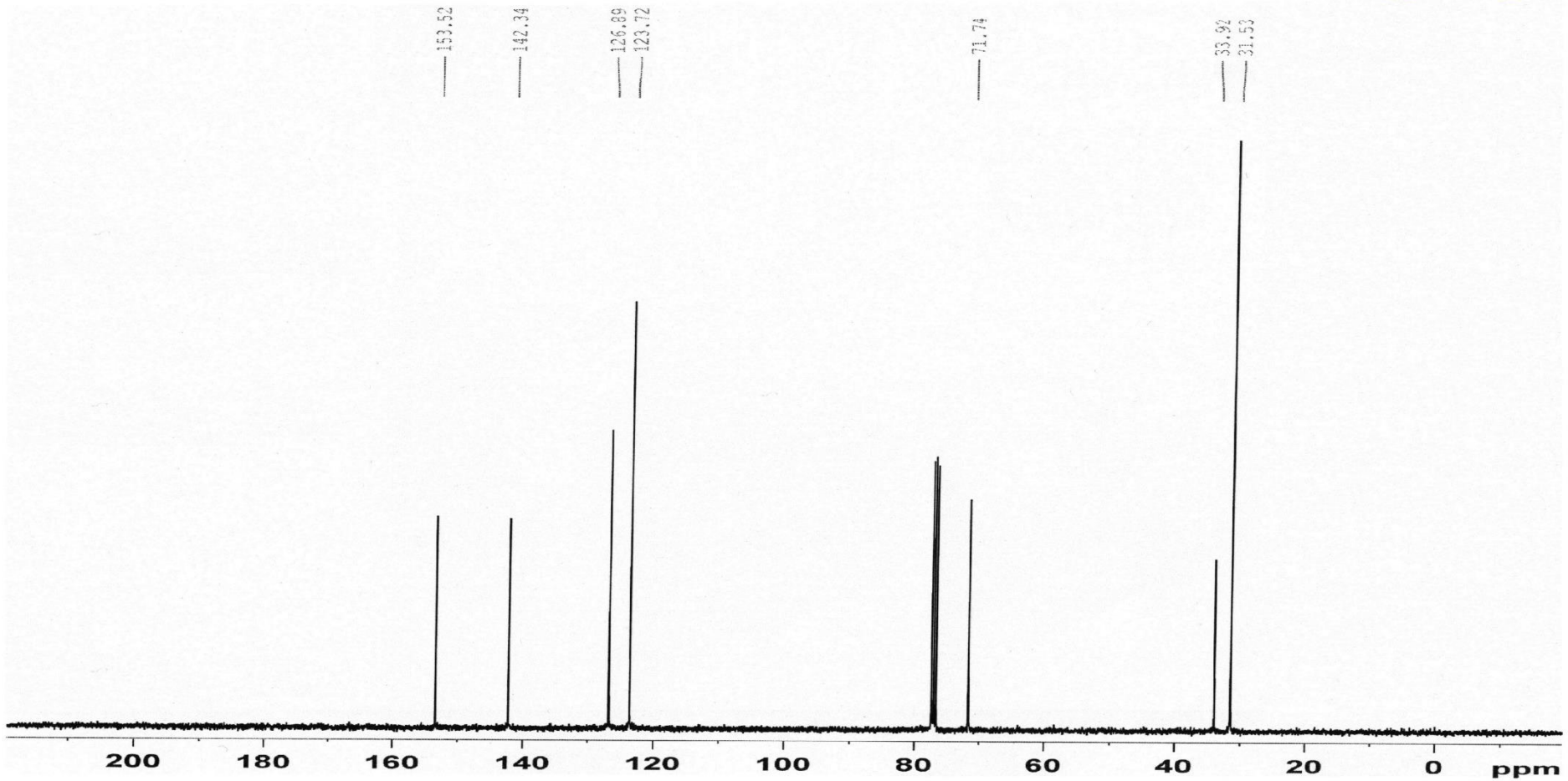


Figure A1 - 5(b): ^{13}C NMR spectra of **5** conducted in $CDCl_3$.

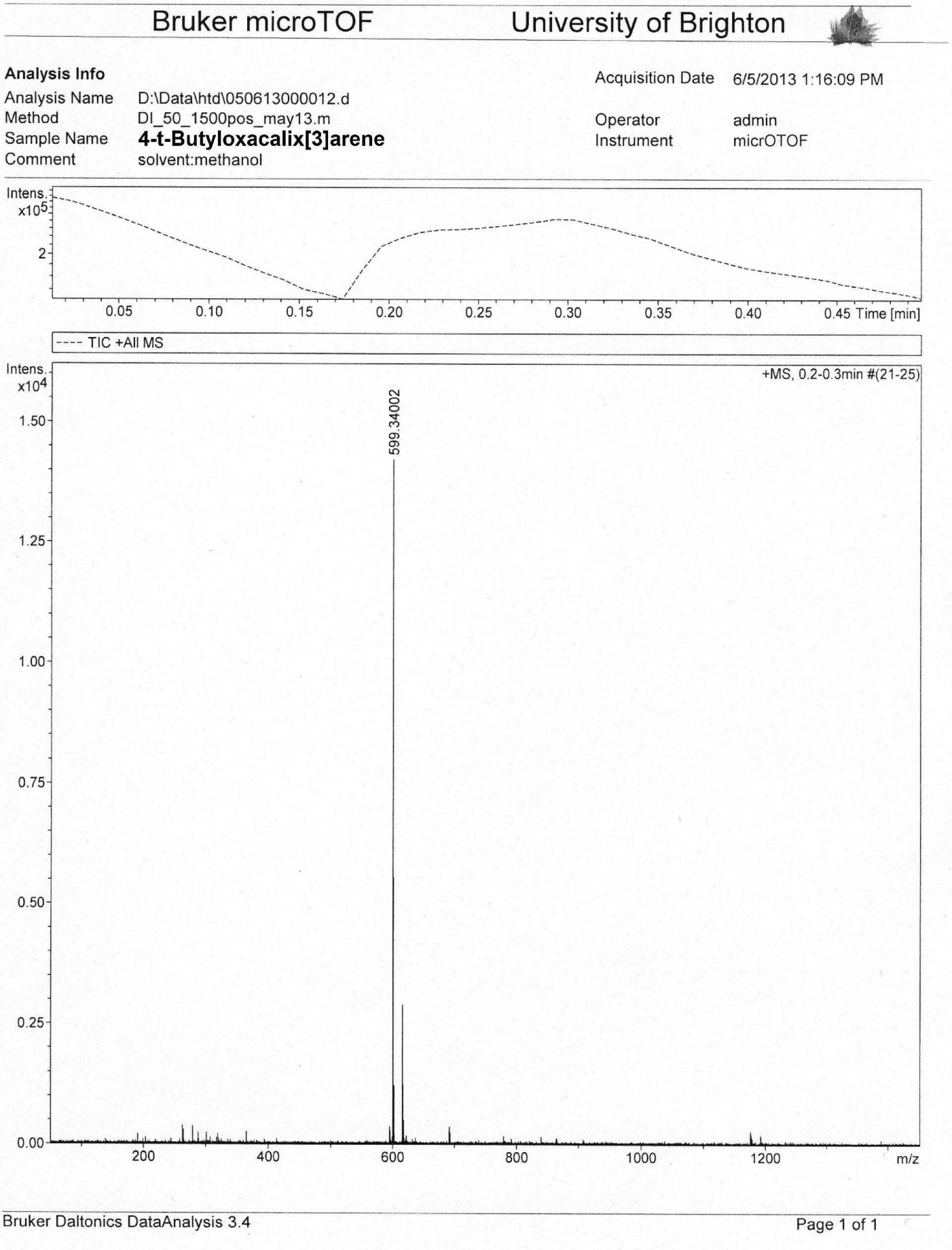


Figure A1 - 5(c): Mass spectra of **5** conducted in methanol.

Dimethoxypillar[5]arene

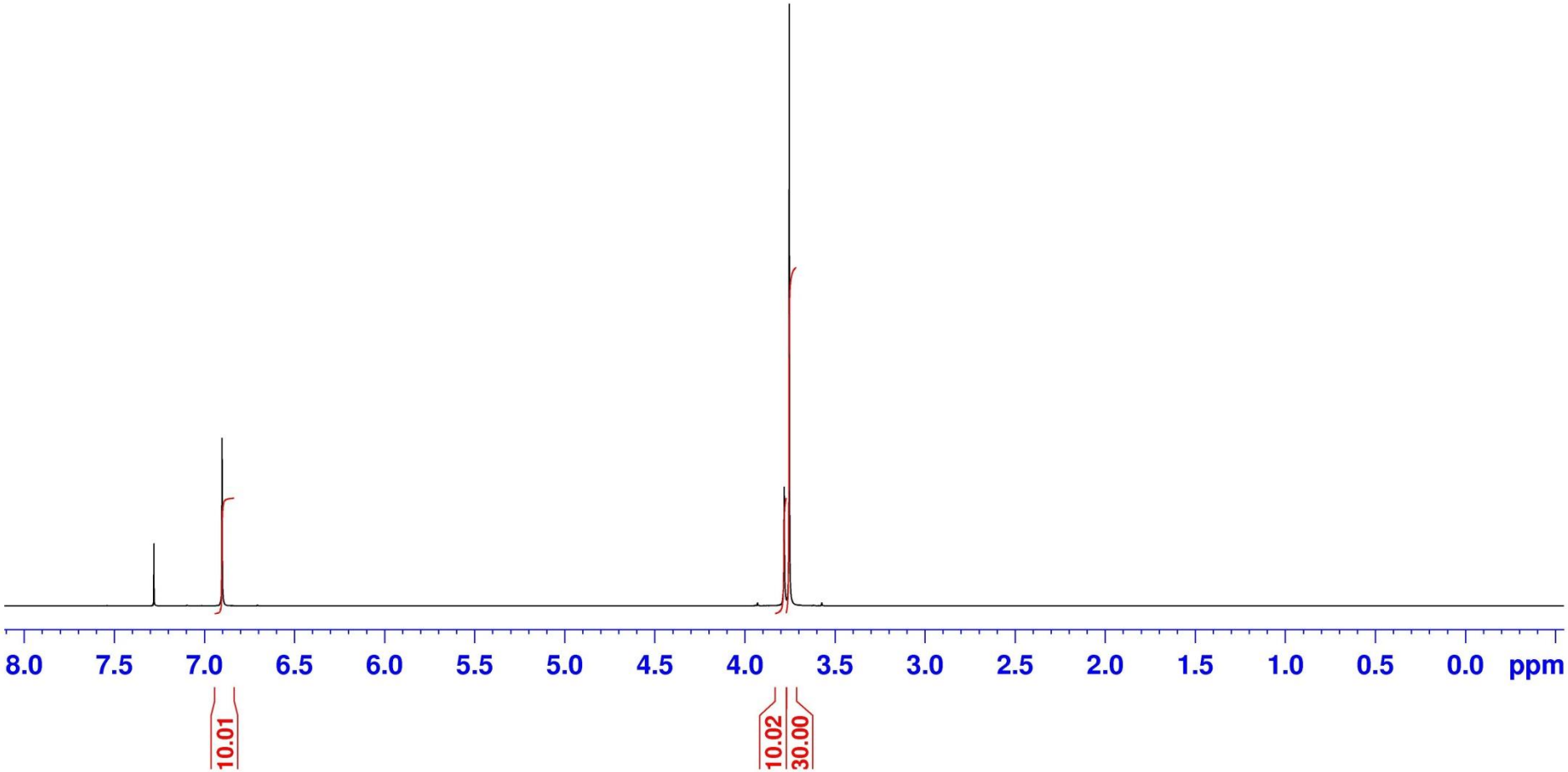


Figure A1 - 6(a): ^{1}H NMR spectra of **6** conducted in $CDCl_3$.

Dimethoxypillar[5]arene

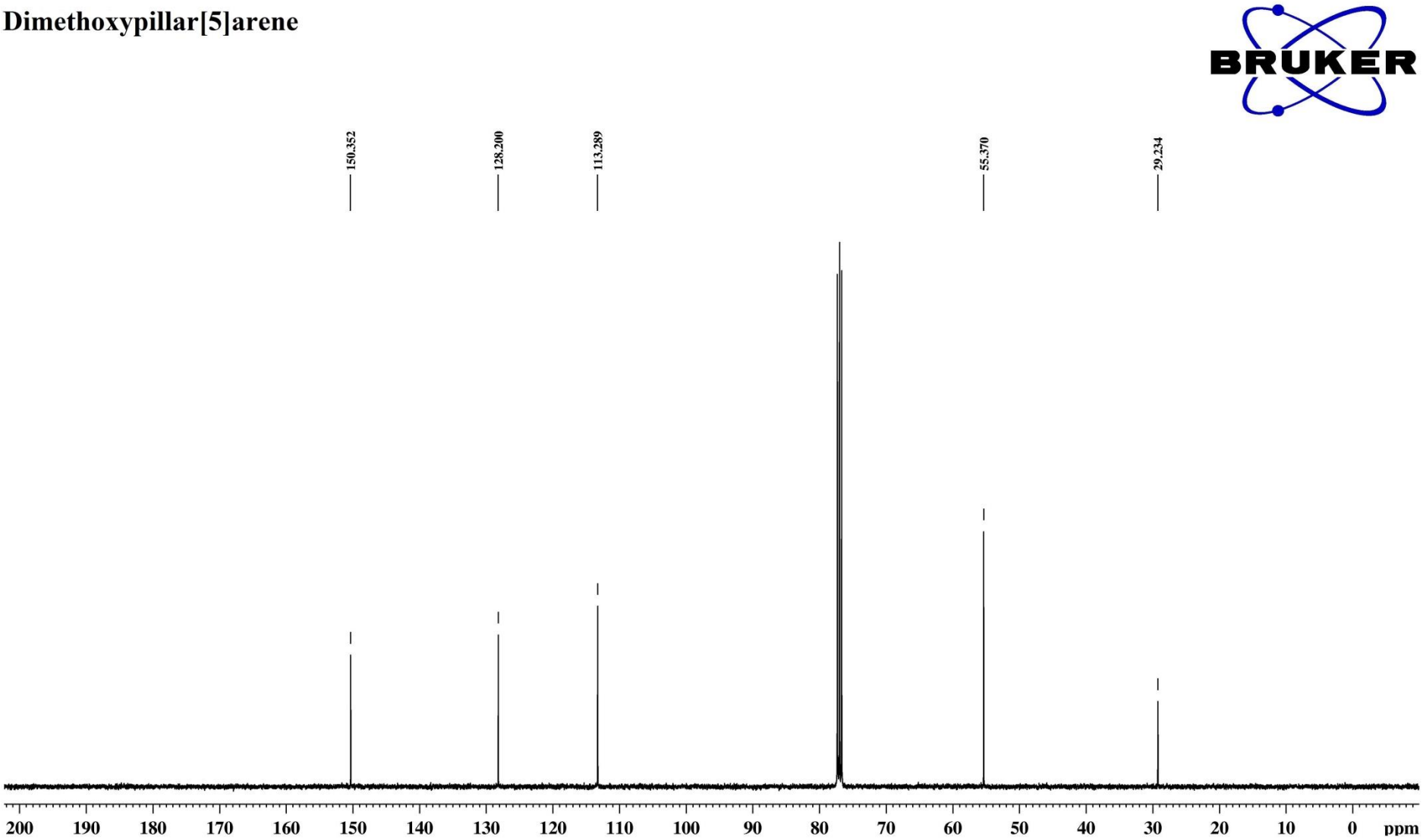


Figure A1 - 6(b): ^{13}C NMR spectra of **6** conducted in $CDCl_3$.

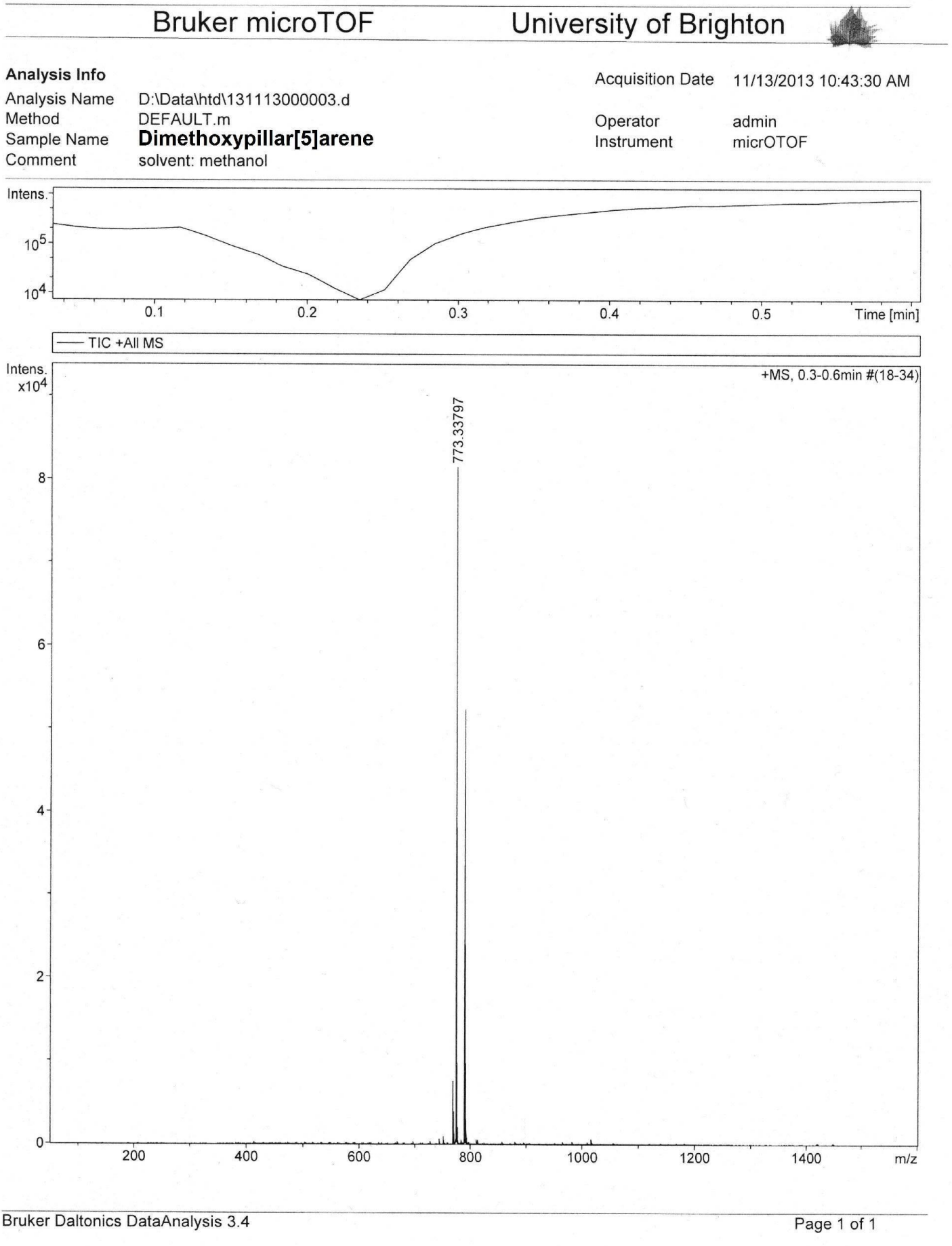


Figure A1 - 6(c): Mass spectra of **6** conducted in methanol.

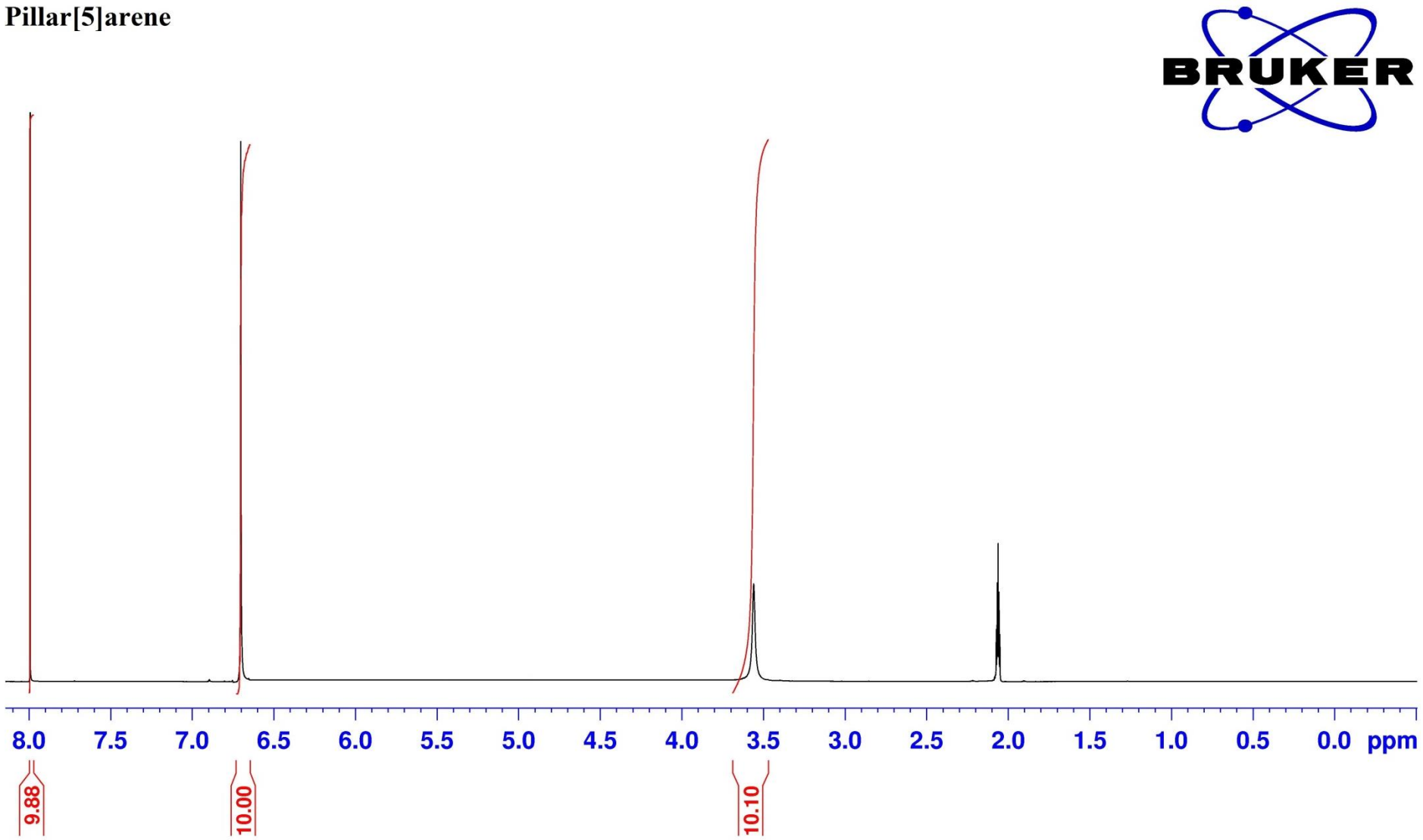


Figure A1 - 7(a): ^{1}H NMR spectra of **7** conducted in CD_3COCD_3.

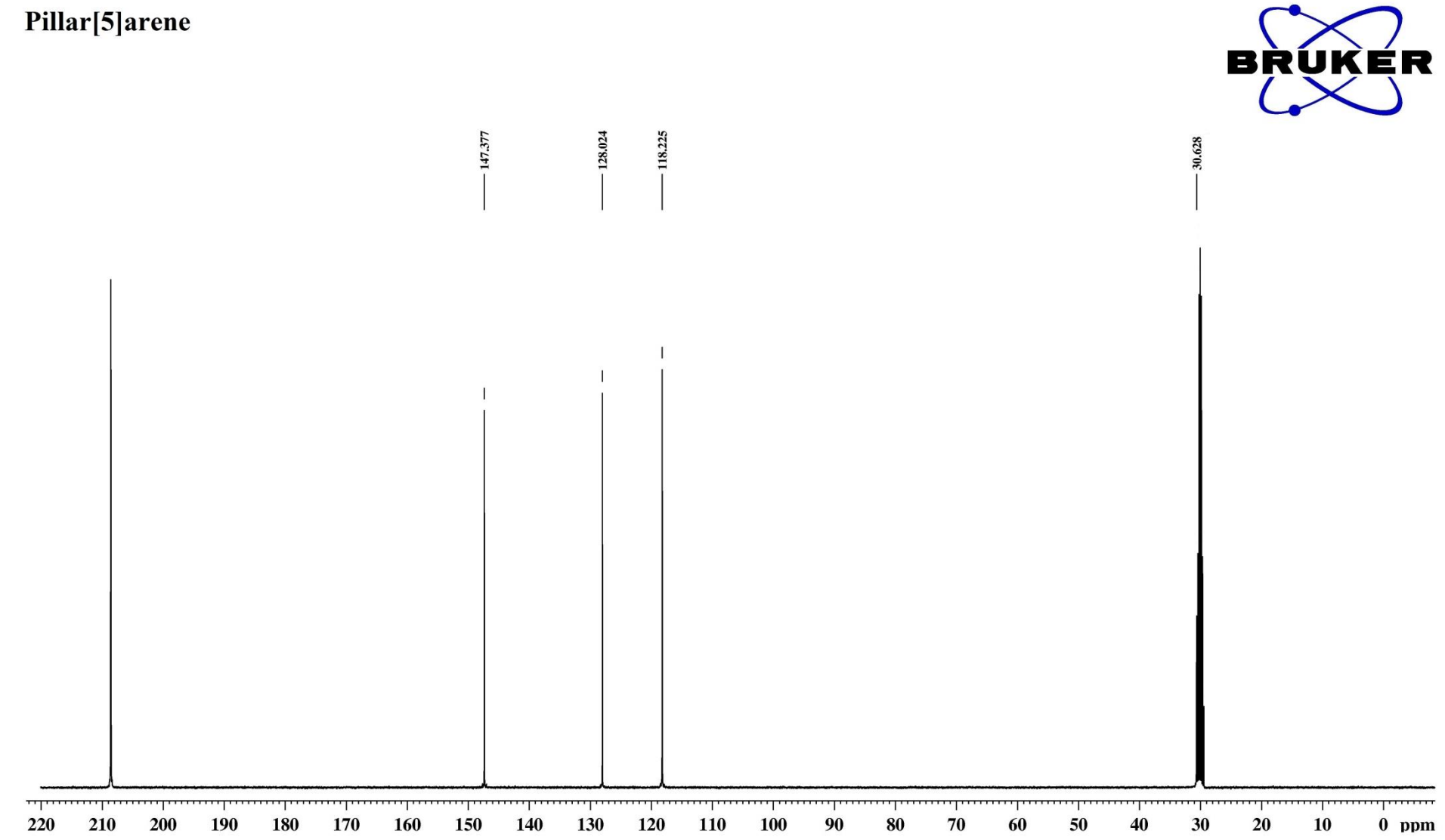


Figure A1 - 7(b): ^{13}C NMR spectra of **7** conducted in CD_3COCD_3.

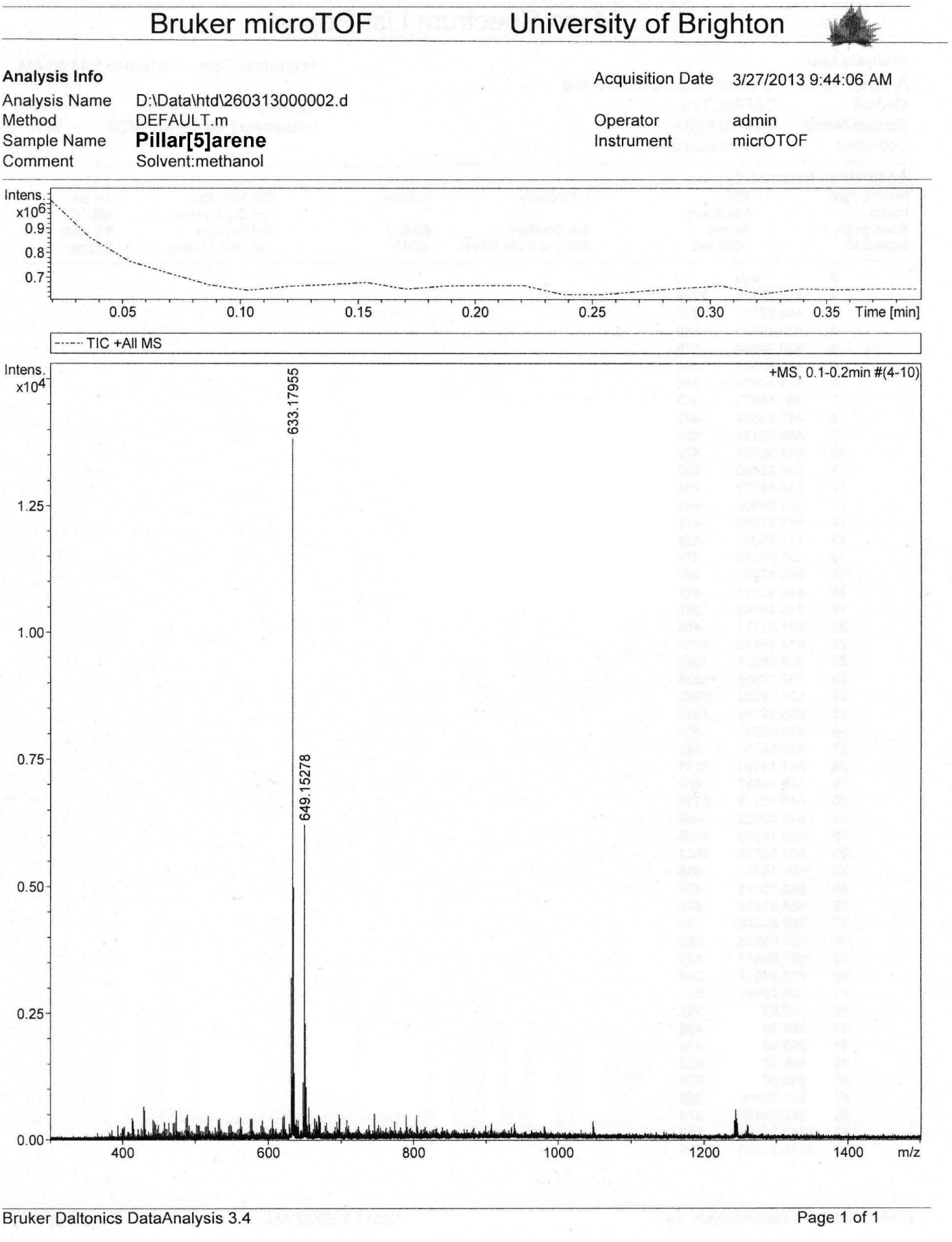


Figure A1 - 7(c): Mass spectra of **7** conducted in methanol.

$1^5,3^5,5^5,7^5$-tetrakis(2-(2-(2-methoxyethoxy)ethoxy)ethoxy)-1,3,5,7(1,3)-tetrabenzenacyclooctaphane

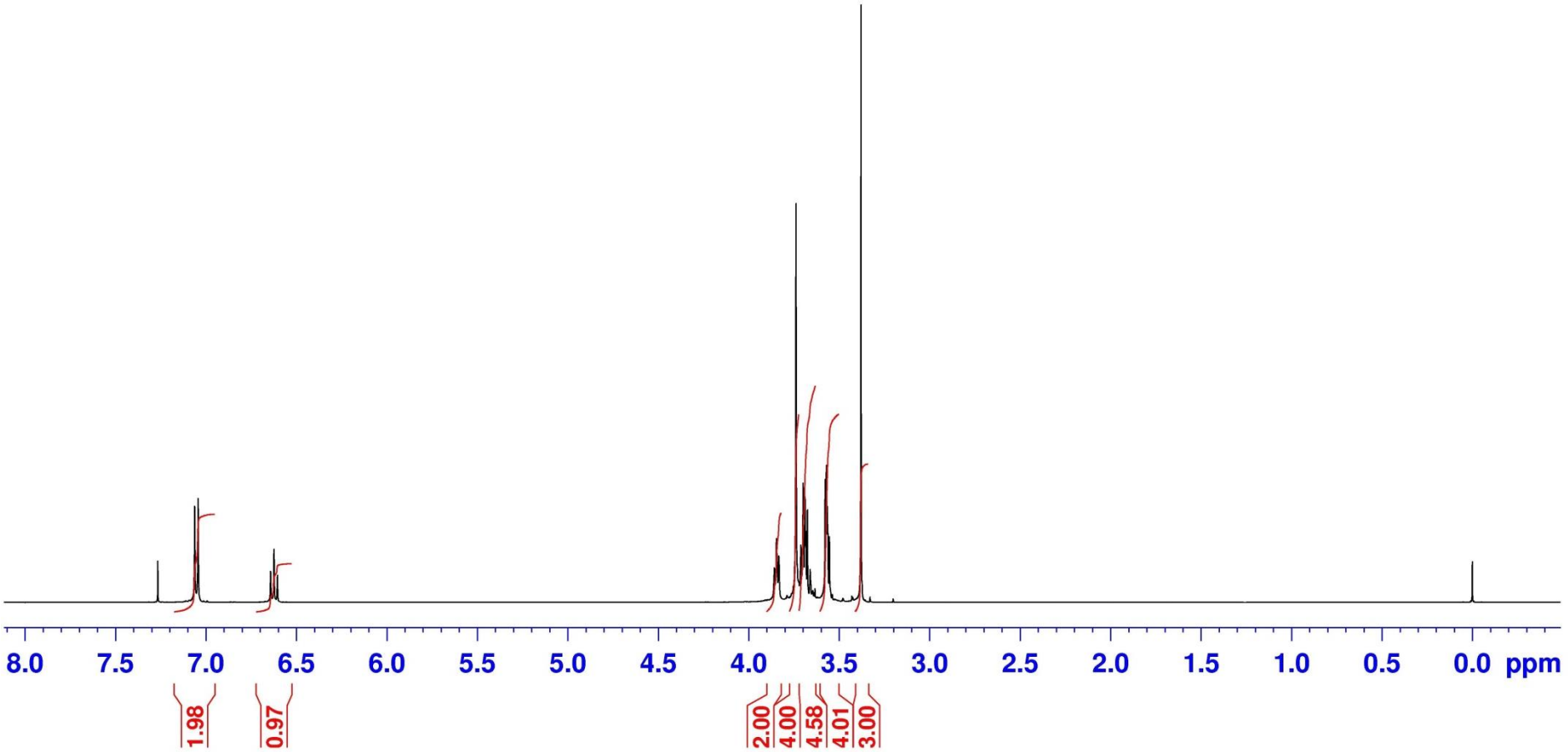


Figure A1 - 8(a): ^{1}H NMR spectra of **8** conducted in $CDCl_3$.

1^5,3^5,5^5,7^5-tetrakis(2-(2-(2-methoxyethoxy)ethoxy)ethoxy)-1,3,5,7(1,3)-tetrabenzenacyclooctaphane

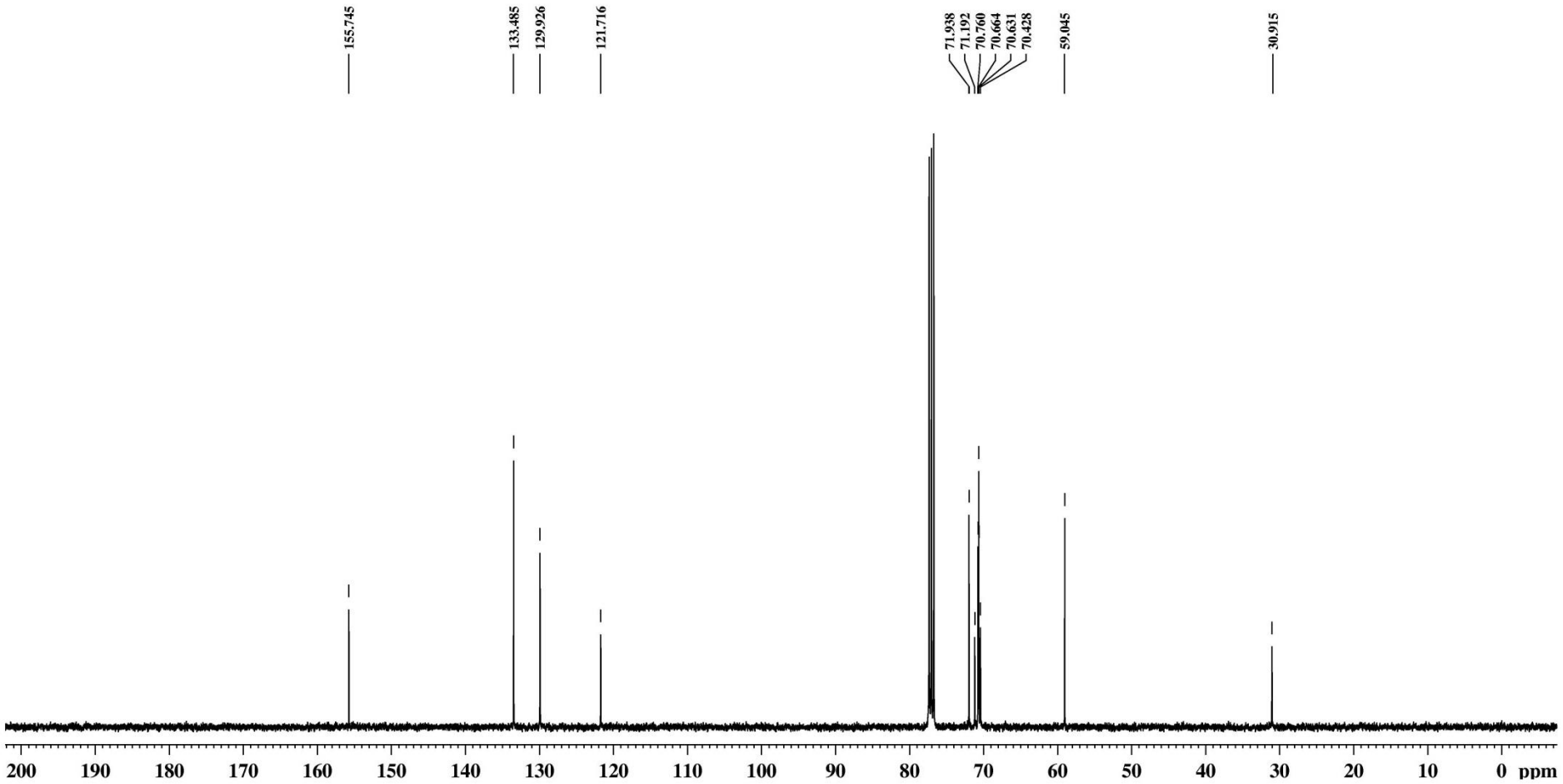


Figure A1 - 8(b): ^{13}C NMR spectra of **8** conducted in $CDCl_3$.

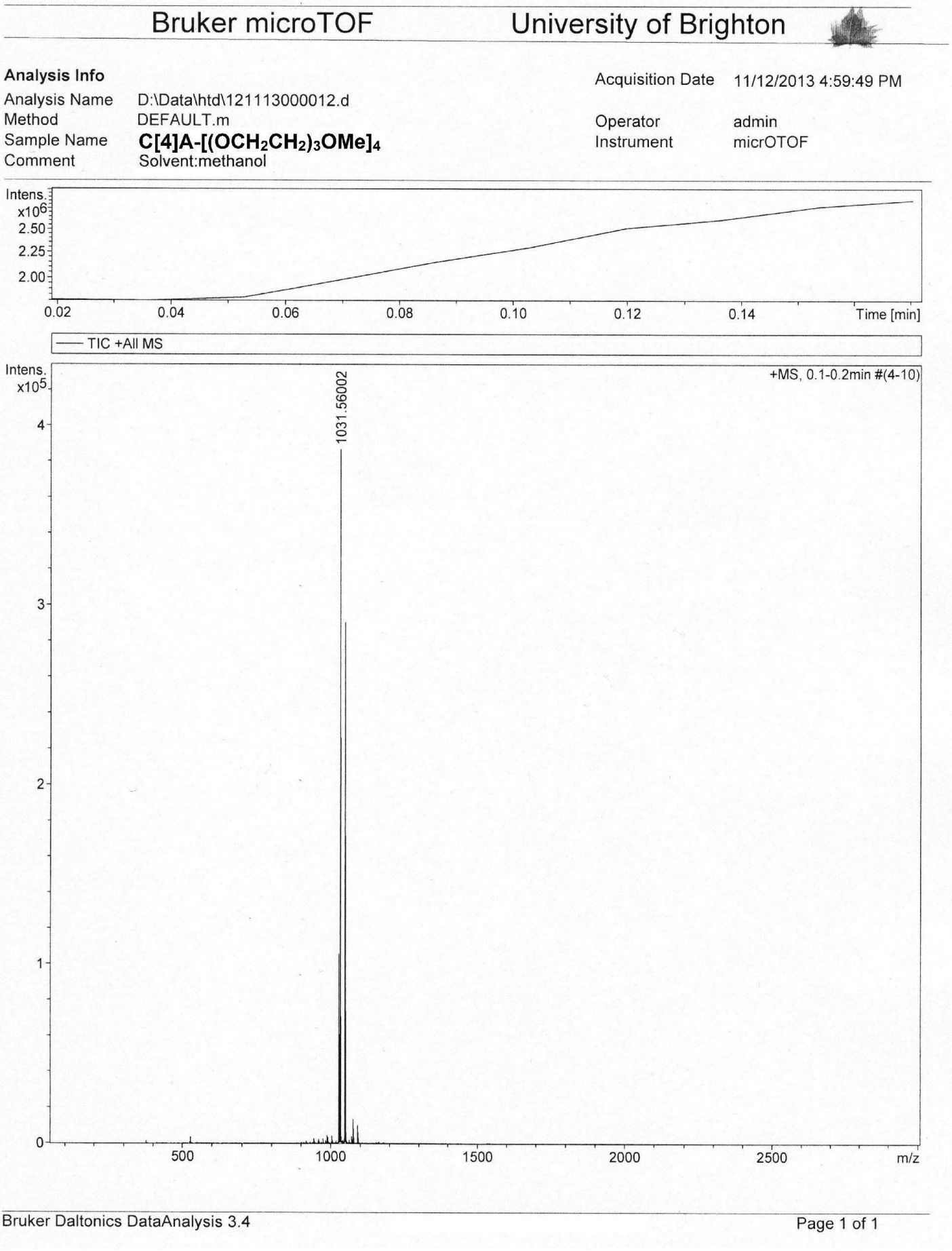


Figure A1 - 8(c): Mass spectra of **8** conducted in methanol.

$1^5,5^5,9^5$-tri-tert-butyl-$1^2,5^2,9^2$-tris(2-(2-(2-methoxyethoxy)ethoxy)ethoxy) - 3,7,11-trioxa-1,5,9(1,3)-tribenzenacyclododecaphane

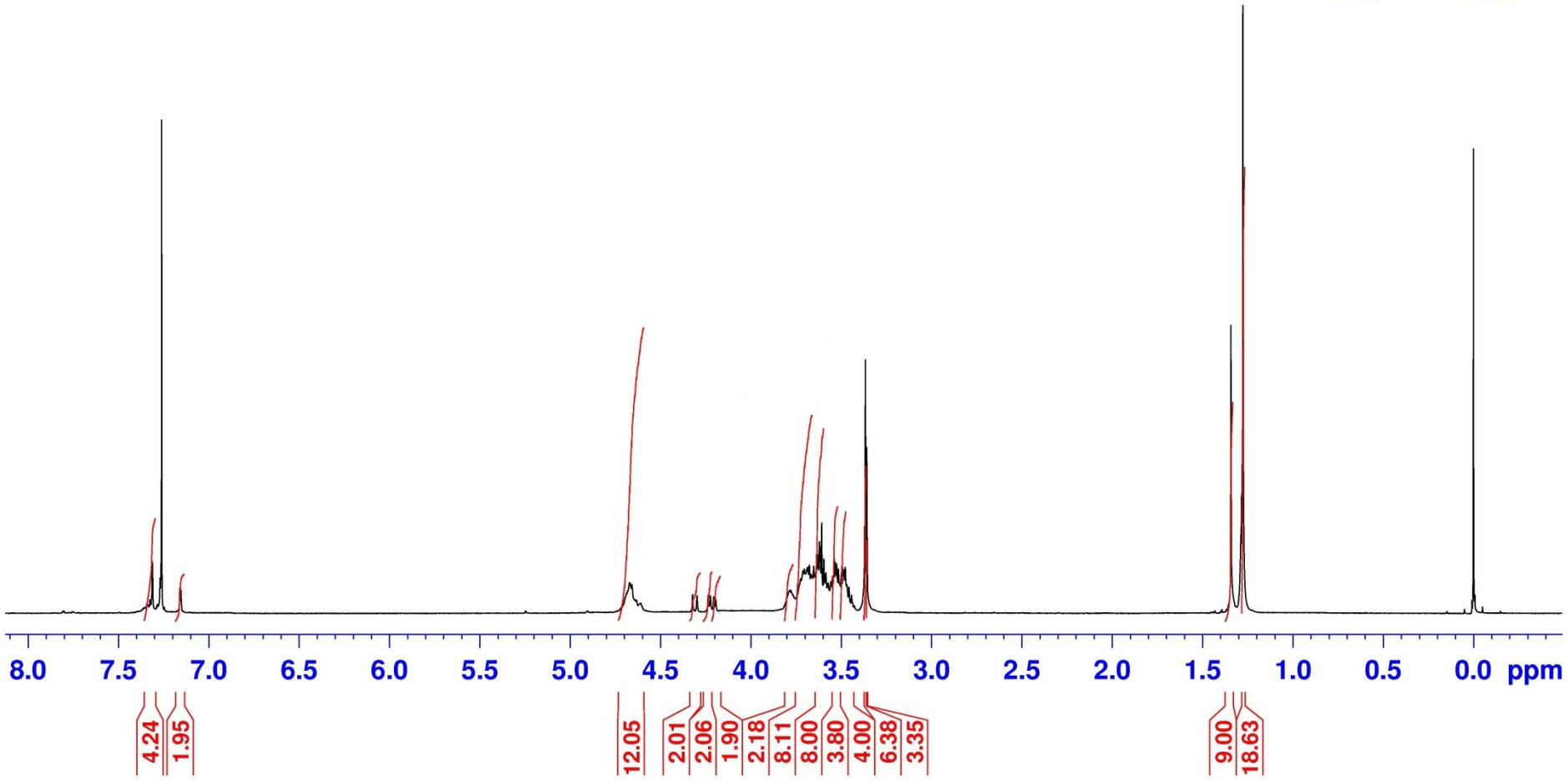


Figure A1 - 9(a): ^{1}H NMR spectra of **9** conducted in $CDCl_3$.

$1^5,5^5,9^5$-tri-tert-butyl-$1^2,5^2,9^2$-tris(2-(2-(2-methoxyethoxy)ethoxy)ethoxy) - 3,7,11-trioxa-1,5,9(1,3)-tribenzenacyclododecaphane

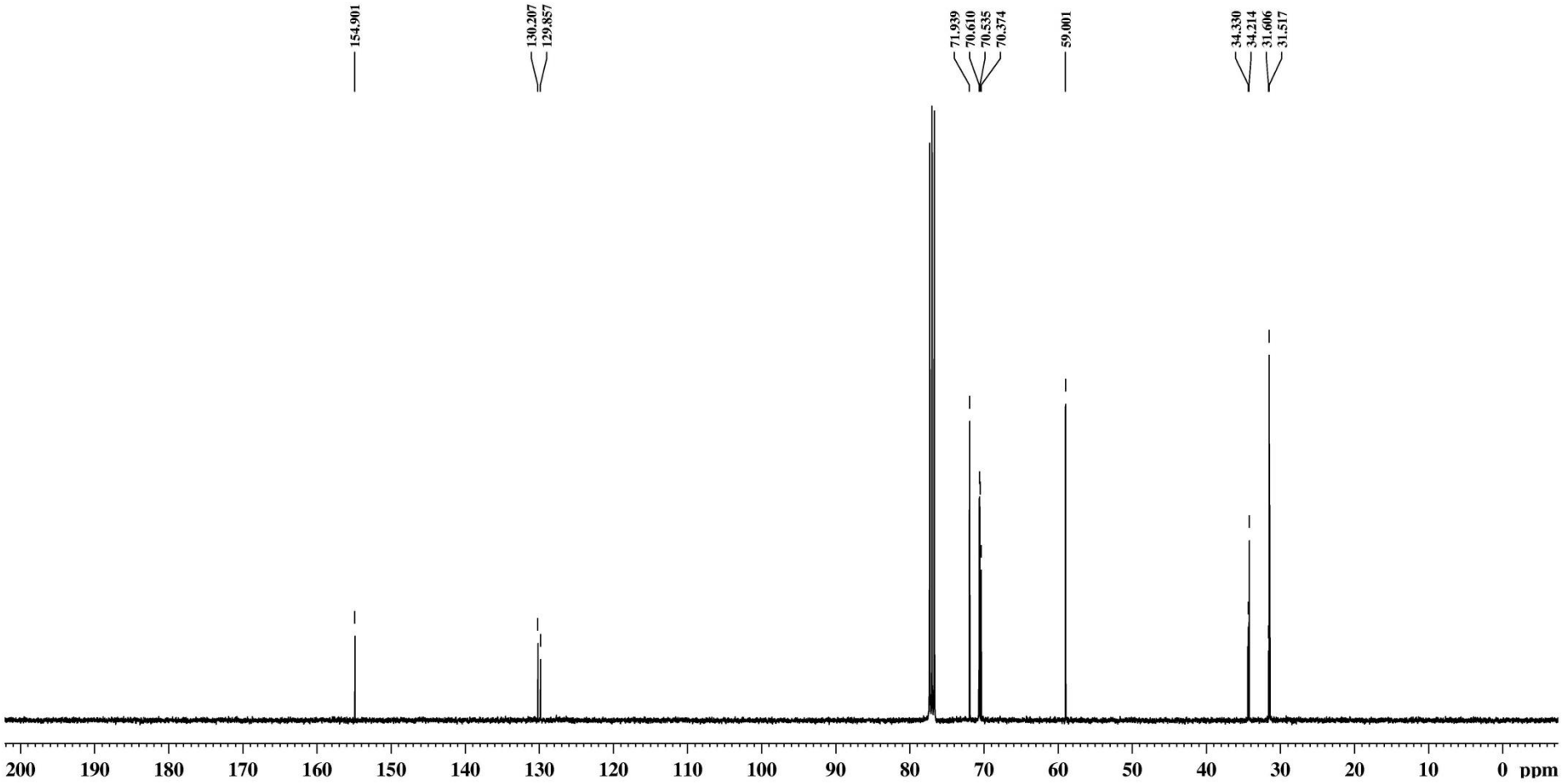


Figure A1 - 9(b): ^{13}C NMR spectra of **9** conducted in $CDCl_3$.

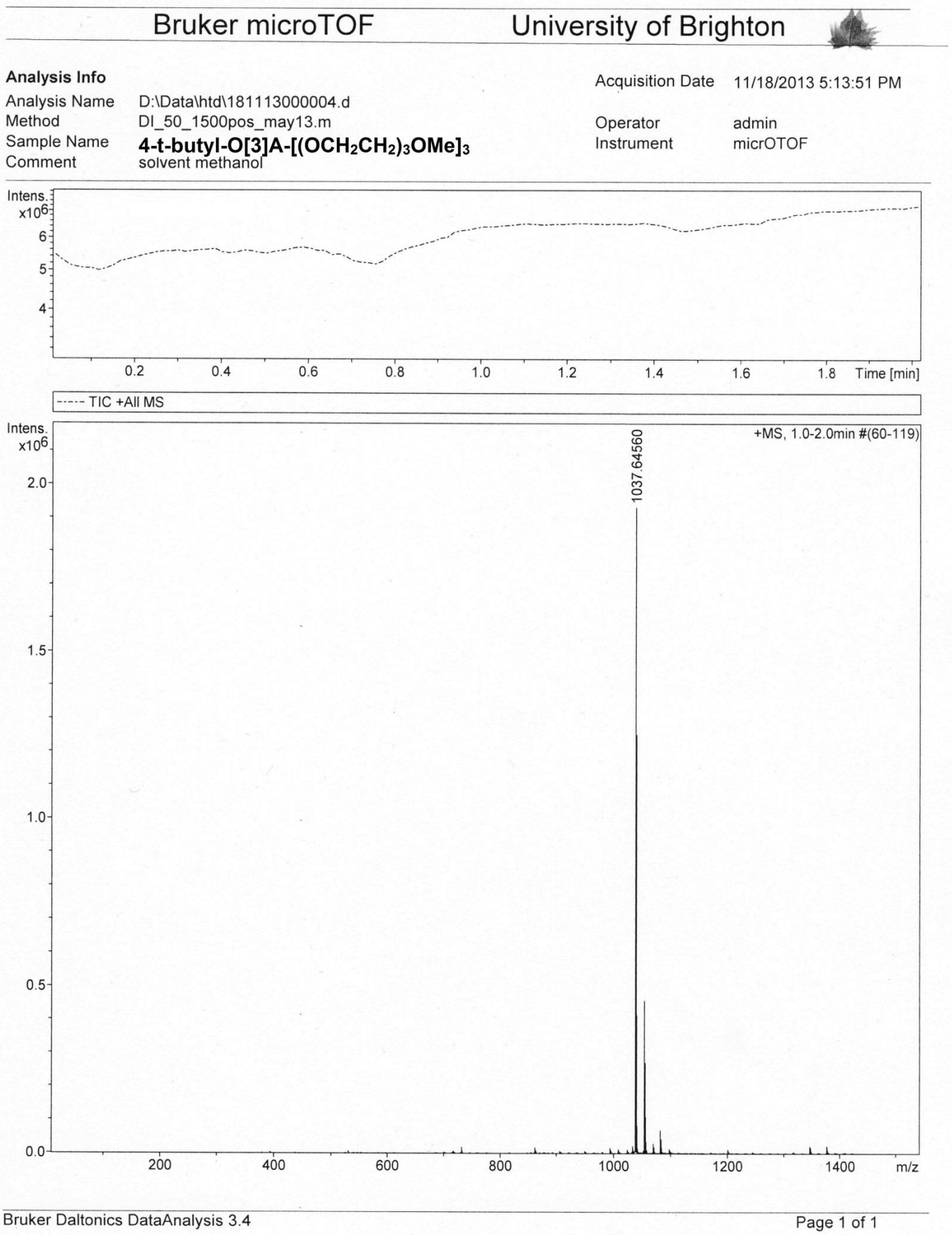


Figure A1 - 9(c): Mass spectra of **9** conducted in methanol.

$1^2,1^5,3^2,3^5,5^2,5^5,7^2,7^5,9^2,9^5$-decakis(2-(2-(2-methoxyethoxy)ethoxy) ethoxy)-1,3,5,7,9(1,4)-pentabenzenacyclodecaphane

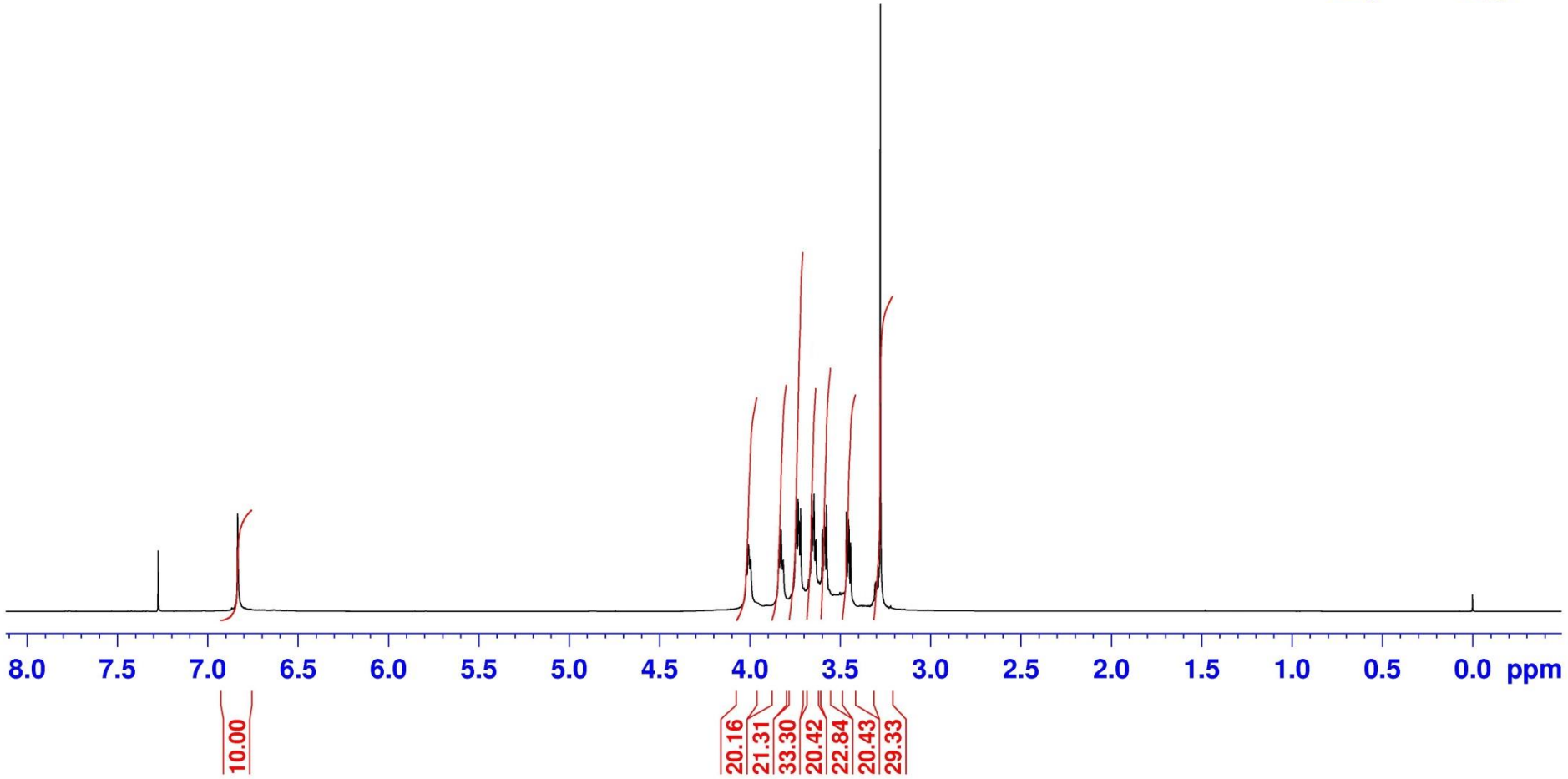


Figure A1 - 10(a): ^{1}H NMR spectra of **10** conducted in $CDCl_3$.

$1^{2},1^{5},3^{2},3^{5},5^{2},5^{5},7^{2},7^{5},9^{2},9^{5}$-decakis(2-(2-(2-methoxyethoxy)ethoxy) ethoxy)-1,3,5,7,9(1,4)-pentabenzenacyclodecaphane

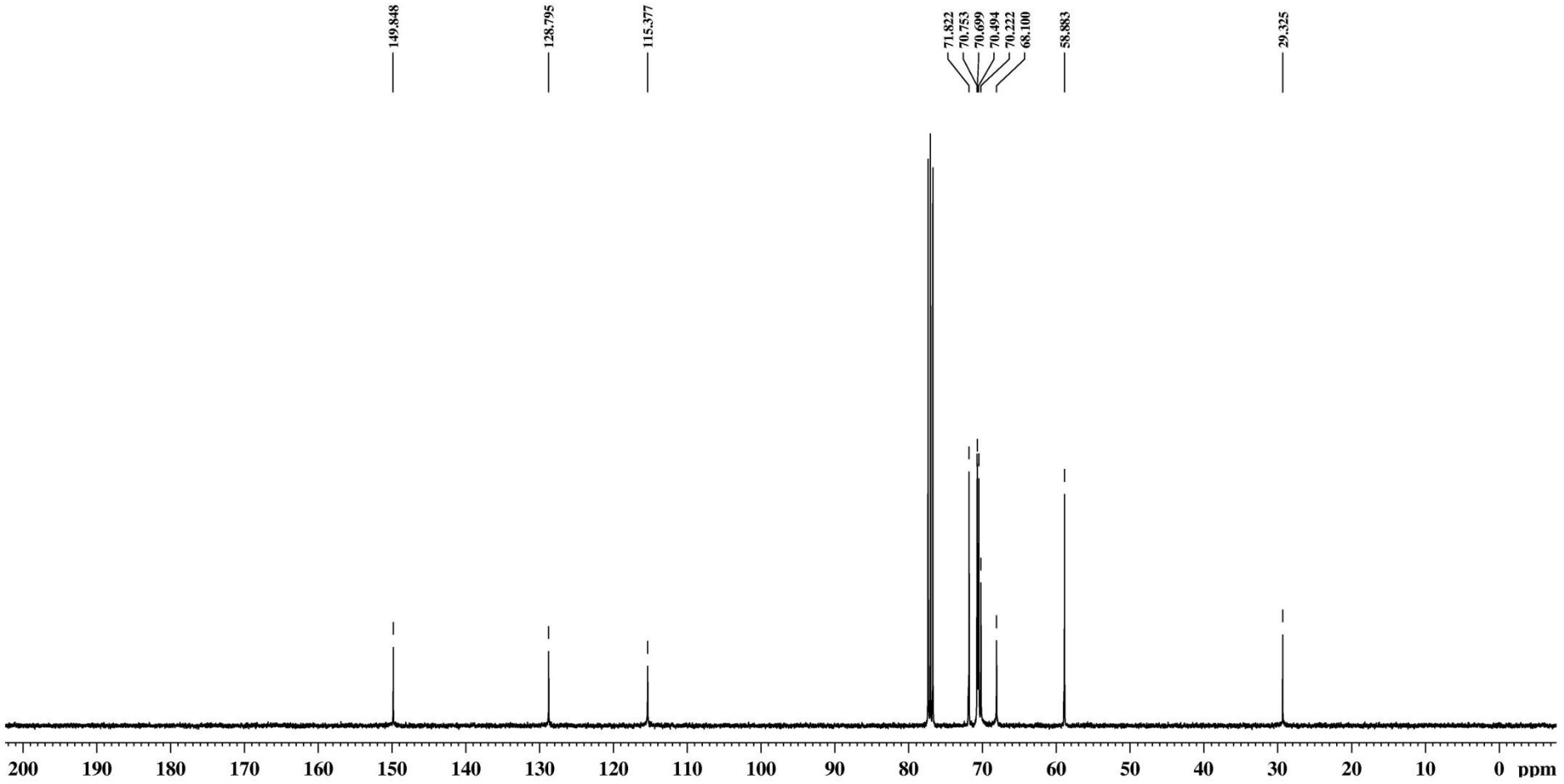


Figure A1 - 10(b): ^{13}C NMR spectra of **10** conducted in $CDCl_3$.

Analysis Info

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Method	DI_50_3000.m	Operator	admin
Sample Name	**P[5]A-[$(OCH_2CH_2)_3OMe]_{10}$**	Instrument	micrOTOF
Comment	solvent: methanol		

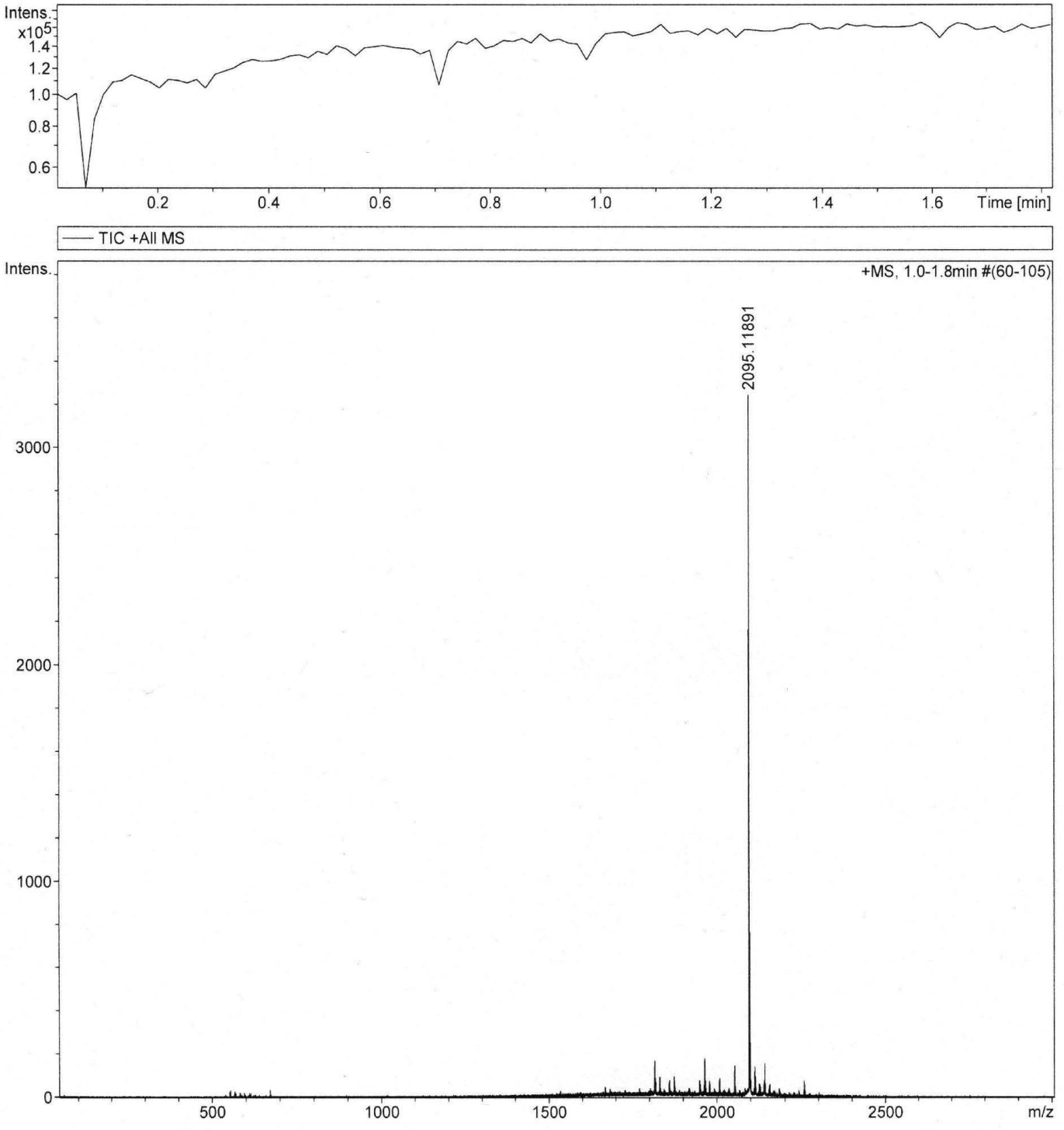


Figure A1 - 10(c): Mass spectra of **10** conducted in methanol.

7,16-bis(2-(2-(2-methoxyethoxy)ethoxy)ethyl)-1,4,10,13-tetraoxa-7,16-diazacyclooctadecane

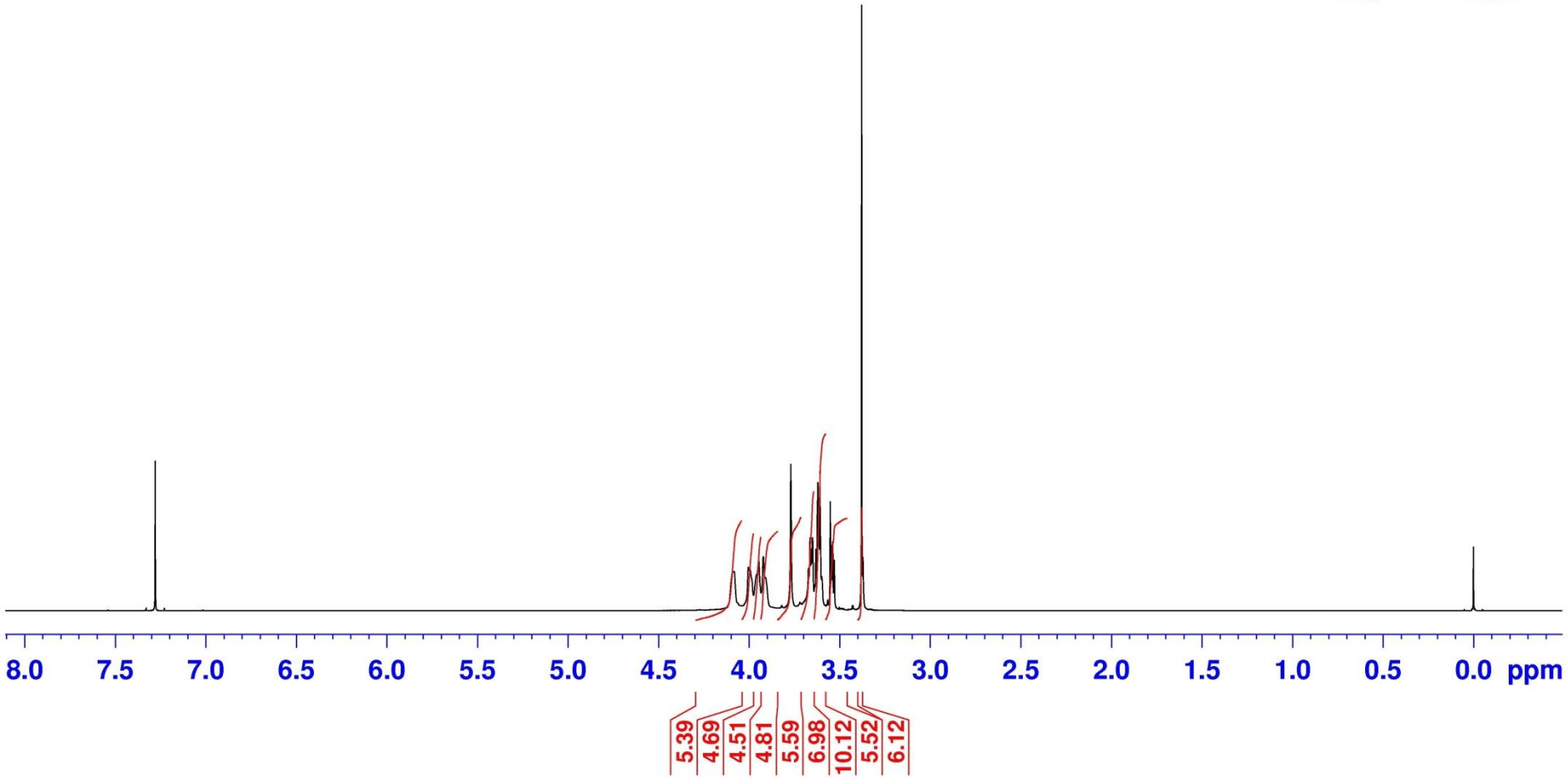


Figure A1 - 11(a): ^{1}H NMR spectra of **11** conducted in $CDCl_3$.

7,16-bis(2-(2-(2-methoxyethoxy)ethoxy)ethyl)-1,4,10,13-tetraoxa-7,16-diazacyclooctadecane

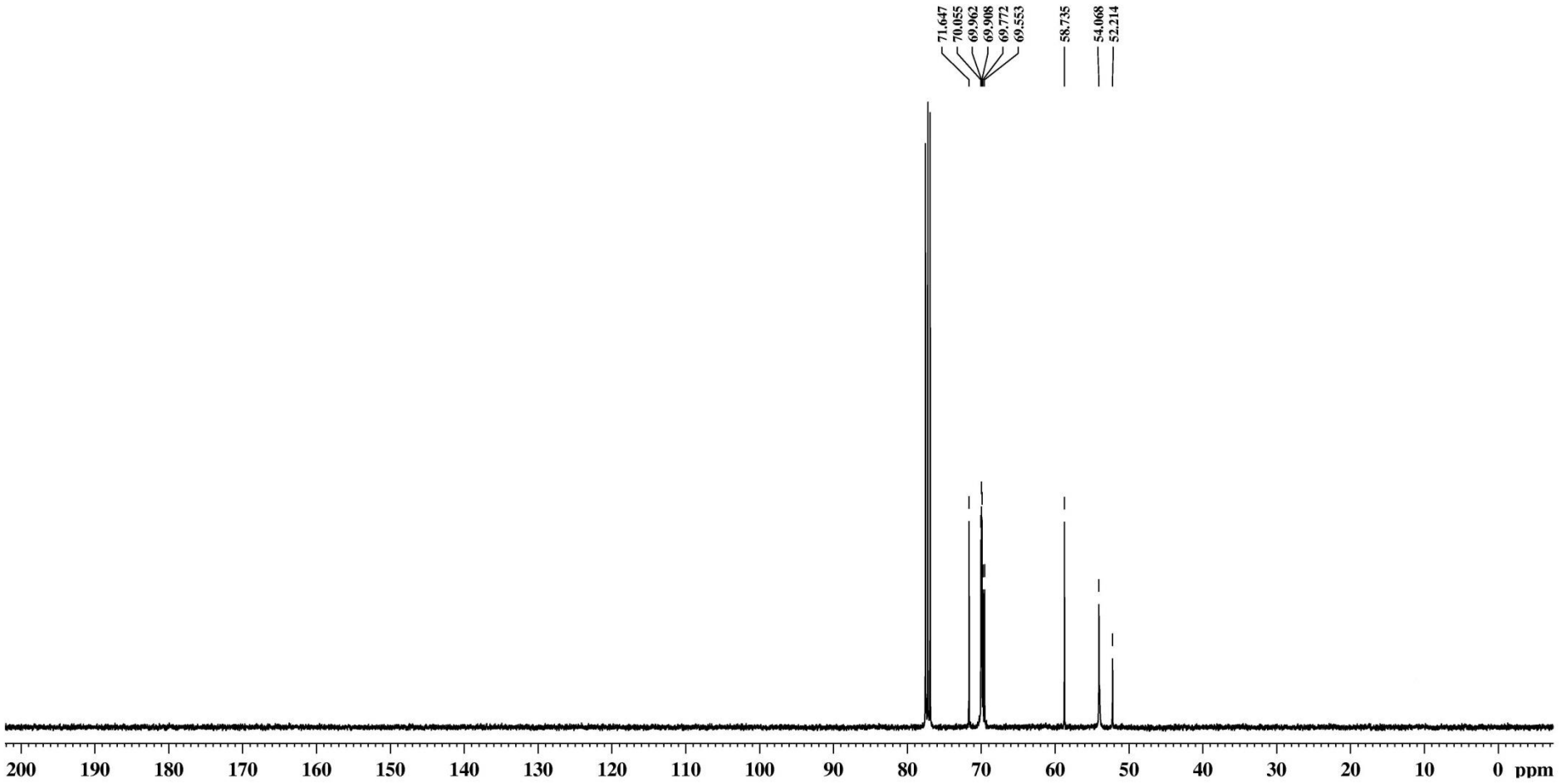


Figure A1 - 11(b): ^{13}C NMR spectra of **11** conducted in $CDCl_3$.

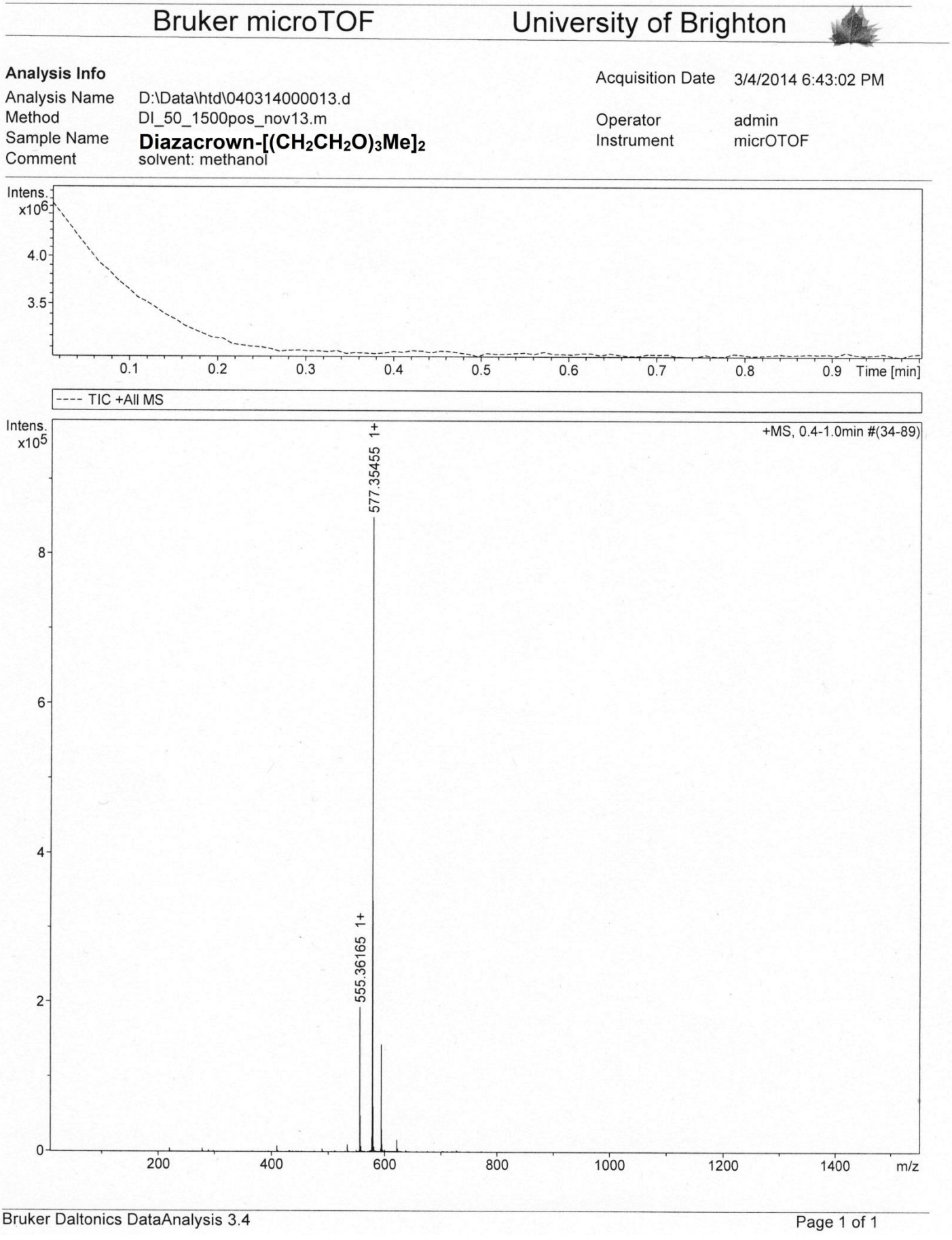


Figure A1 - 11(c): Mass spectra of **11** conducted in methanol.

1^2,5^2,9^2-tris(((E)-2,5,8,11-tetraoxapentadec-13-en-15-yl)oxy)-1^5,5^5,9^5-tri-*tert*-butyl-3,7,11-trioxa-1,5,9(1,3)-tribenzenacyclododecaphane

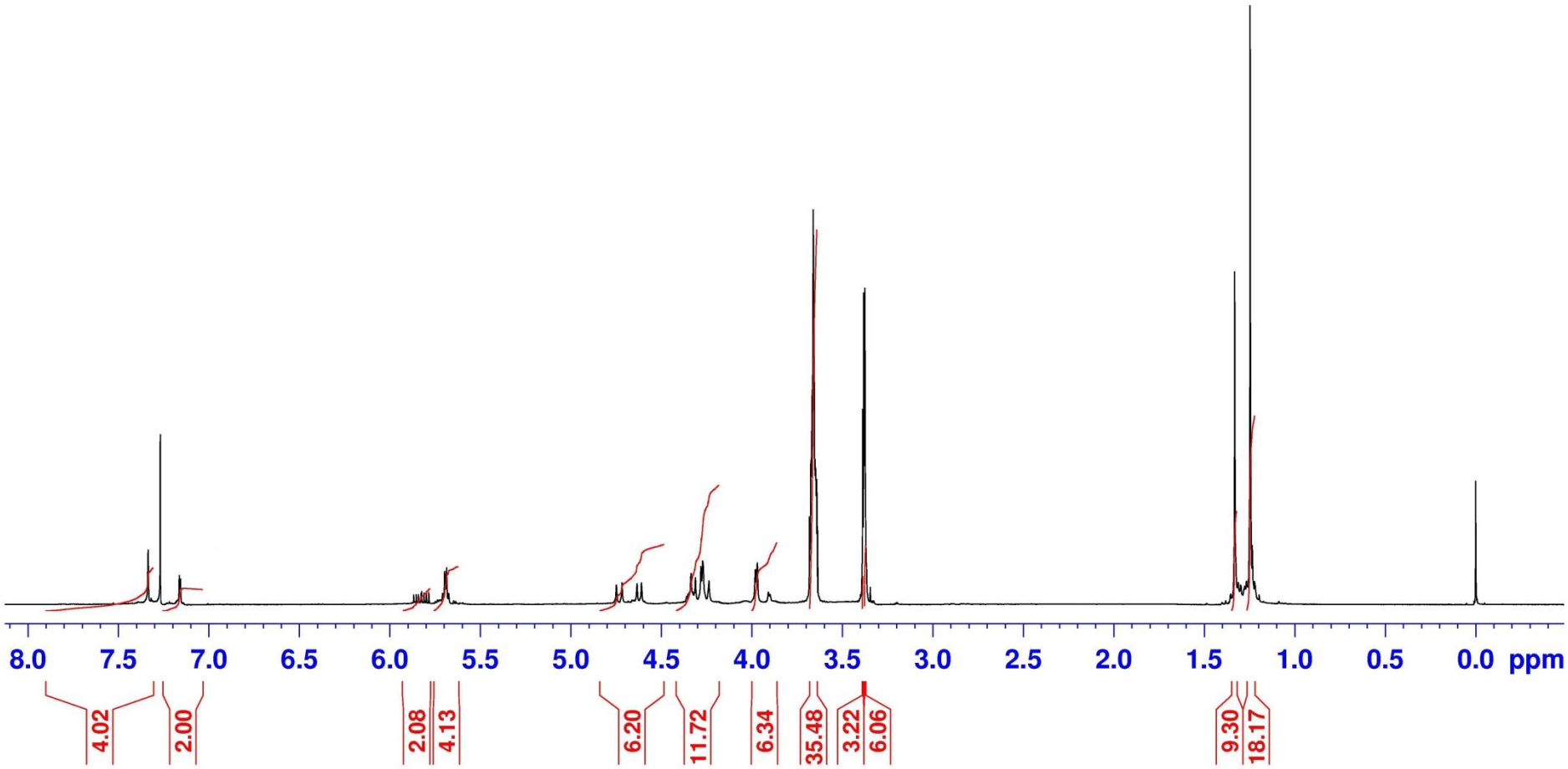


Figure A1 - 12(a): ^{1}H NMR spectra of **12** conducted in $CDCl_3$.

$1^2,5^2,9^2$-tris(((E)-2,5,8,11-tetraoxapentadec-13-en-15-yl)oxy)-$1^5,5^5,9^5$-tri-*tert*-butyl-3,7,11-trioxa-1,5,9(1,3)-tribenzenacyclododecaphane

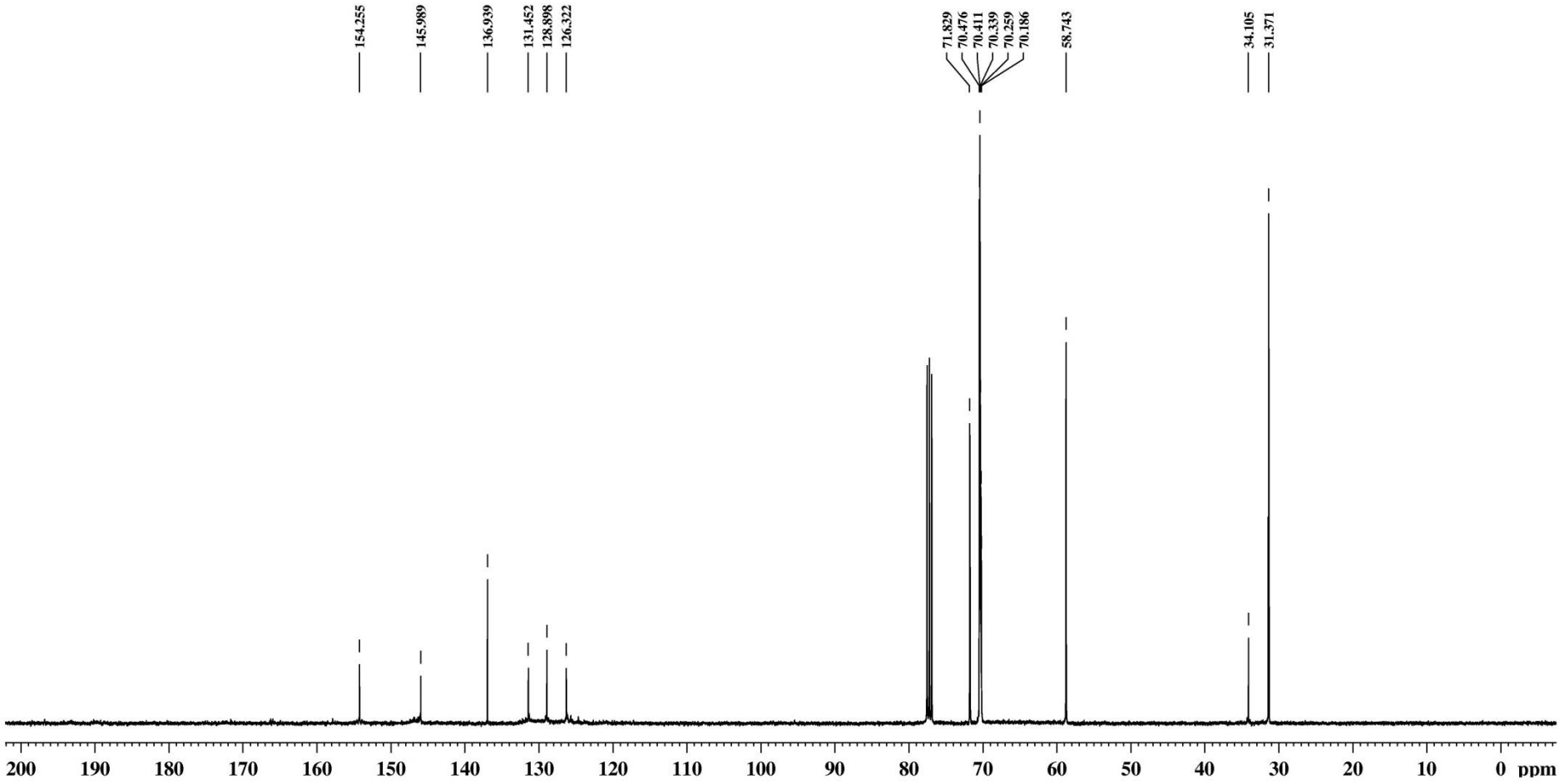


Figure A1 - 12(b): ^{13}C NMR spectra of **12** conducted in $CDCl_3$.

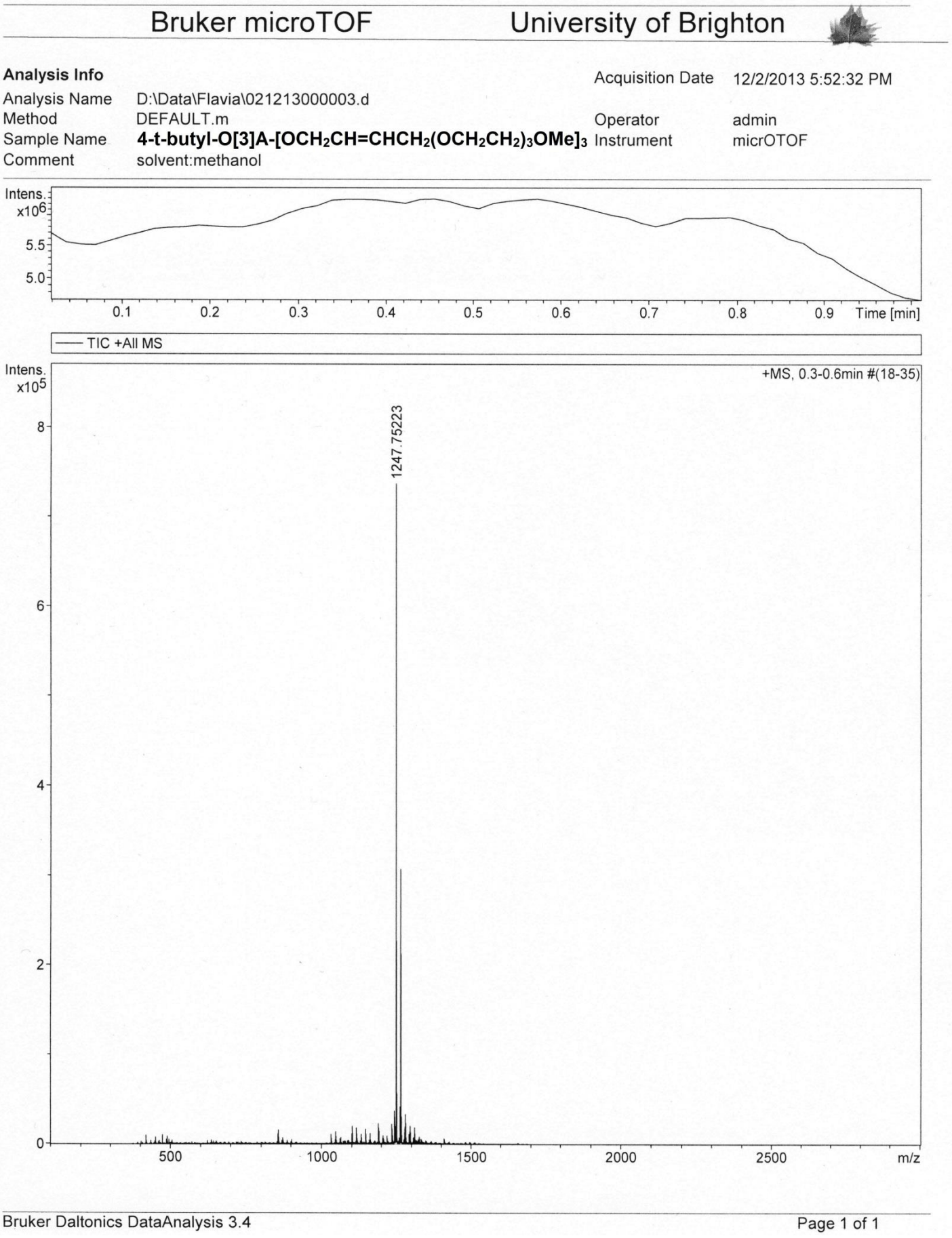


Figure A1 - 12(c): Mass spectra of **12** conducted in methanol.

7,16-di((E)-2,5,8,11-tetraoxapentadec-13-en-15-yl)-1,4,10,13-tetraoxa-7,16-diazacyclooctadecane

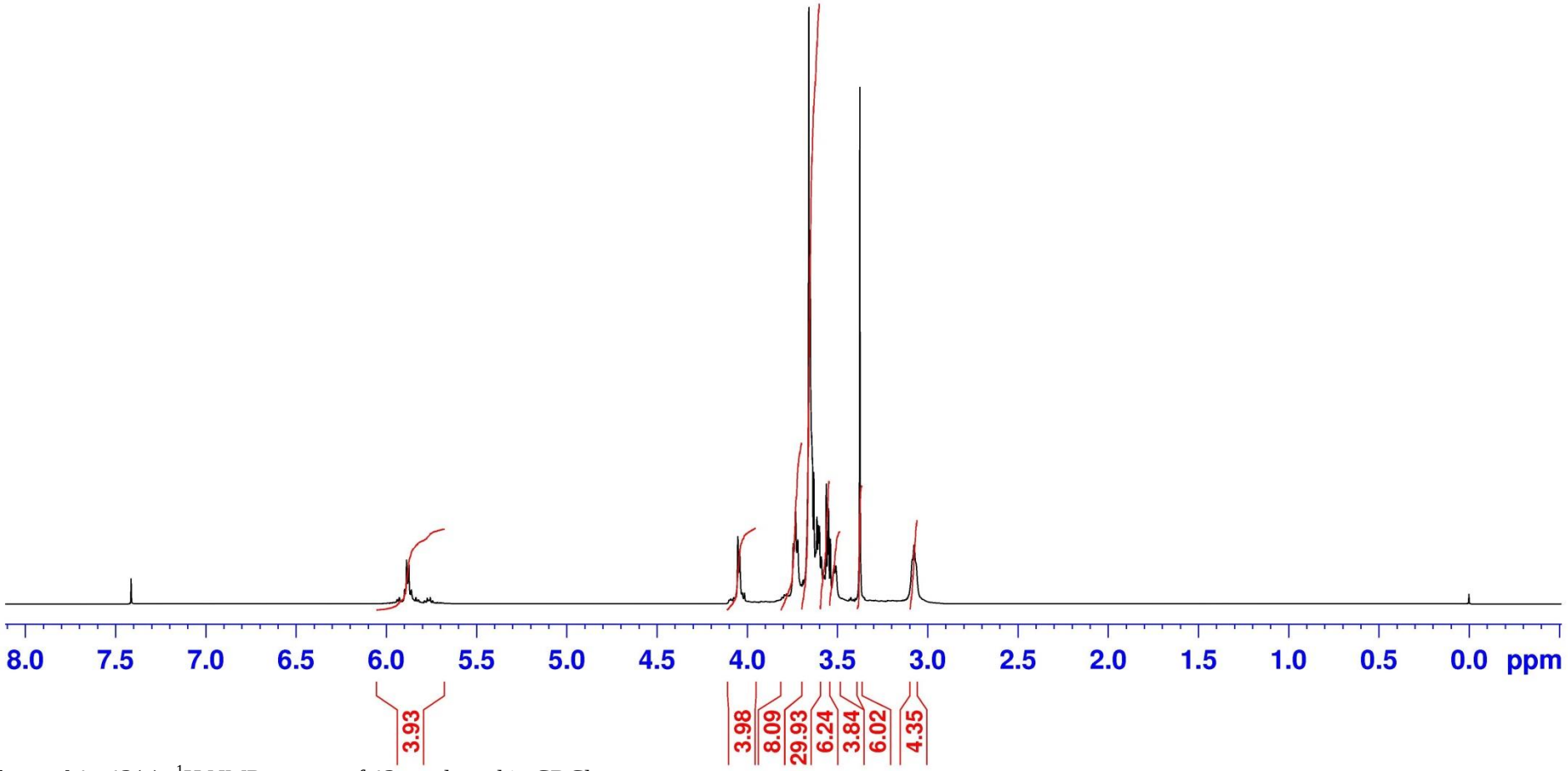


Figure A1 - 13(a): ^{1}H NMR spectra of **13** conducted in $CDCl_3$.

7,16-di((E)-2,5,8,11-tetraoxapentadec-13-en-15-yl)-1,4,10,13-tetraoxa-7,16-diazacyclooctadecane

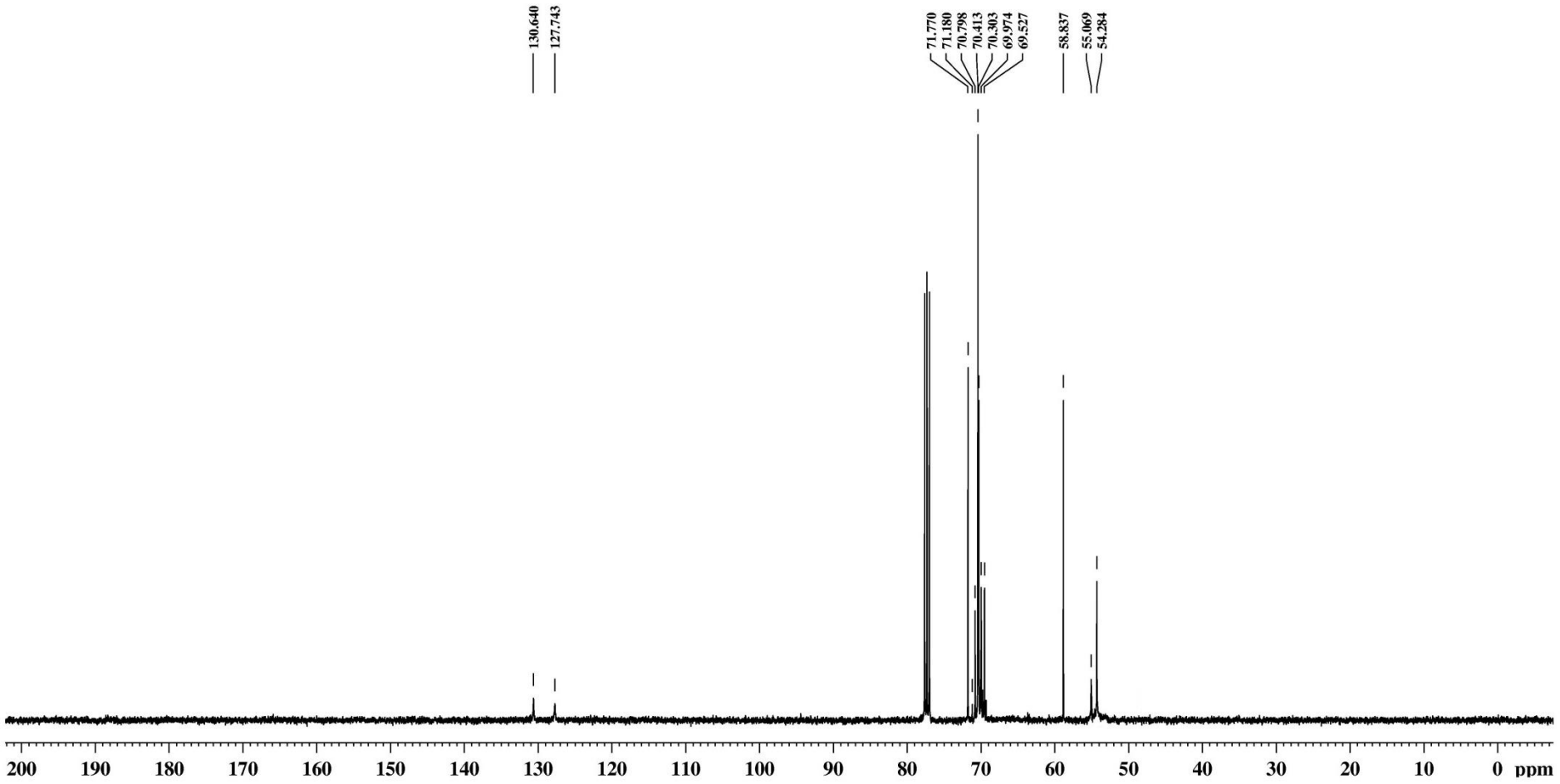


Figure A1 - 13(b): ^{13}C NMR spectra of **13** conducted in $CDCl_3$.

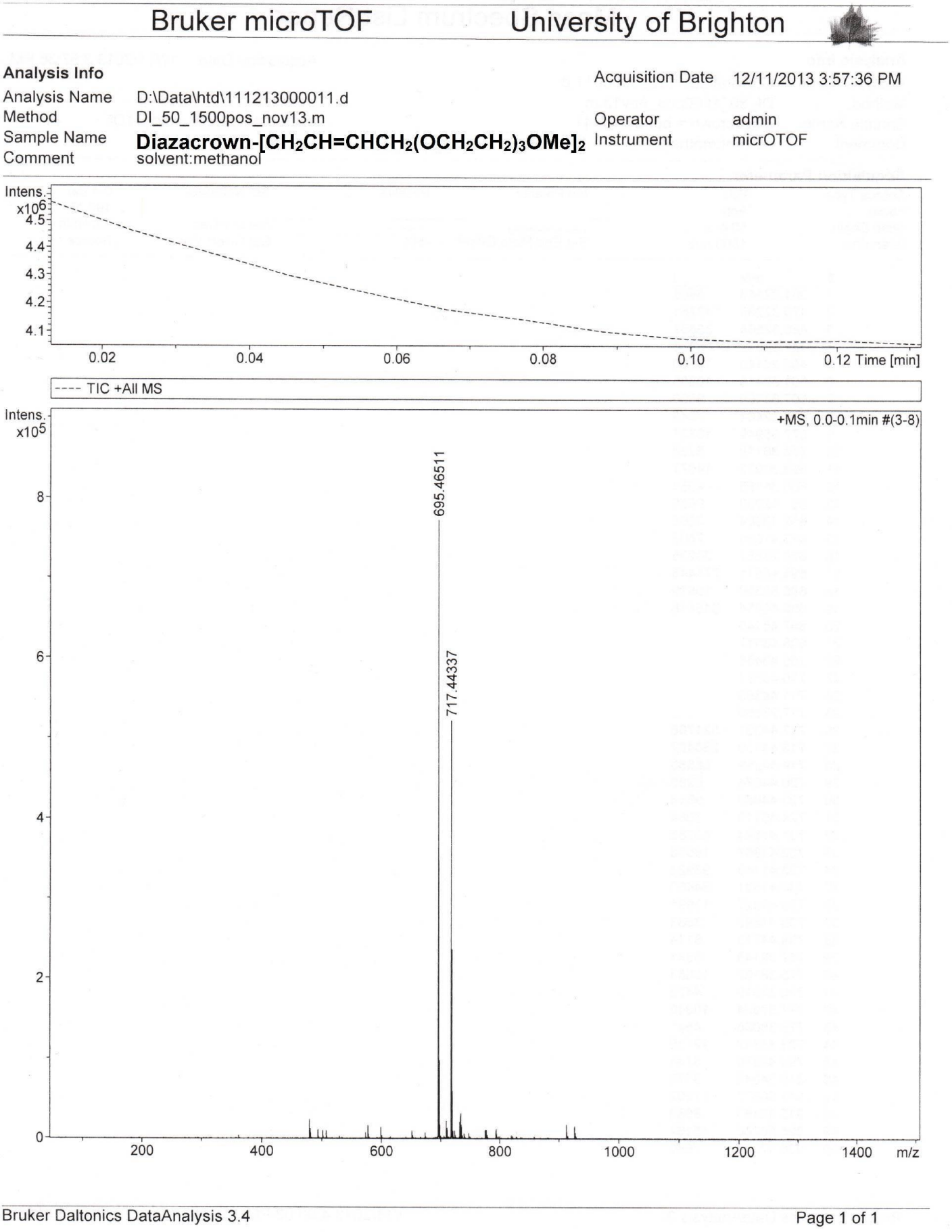


Figure A1 - 13(c): Mass spectra of **13** conducted in methanol.

(2-(2-(2-methoxyethoxy)ethoxy)ethoxy)benzene

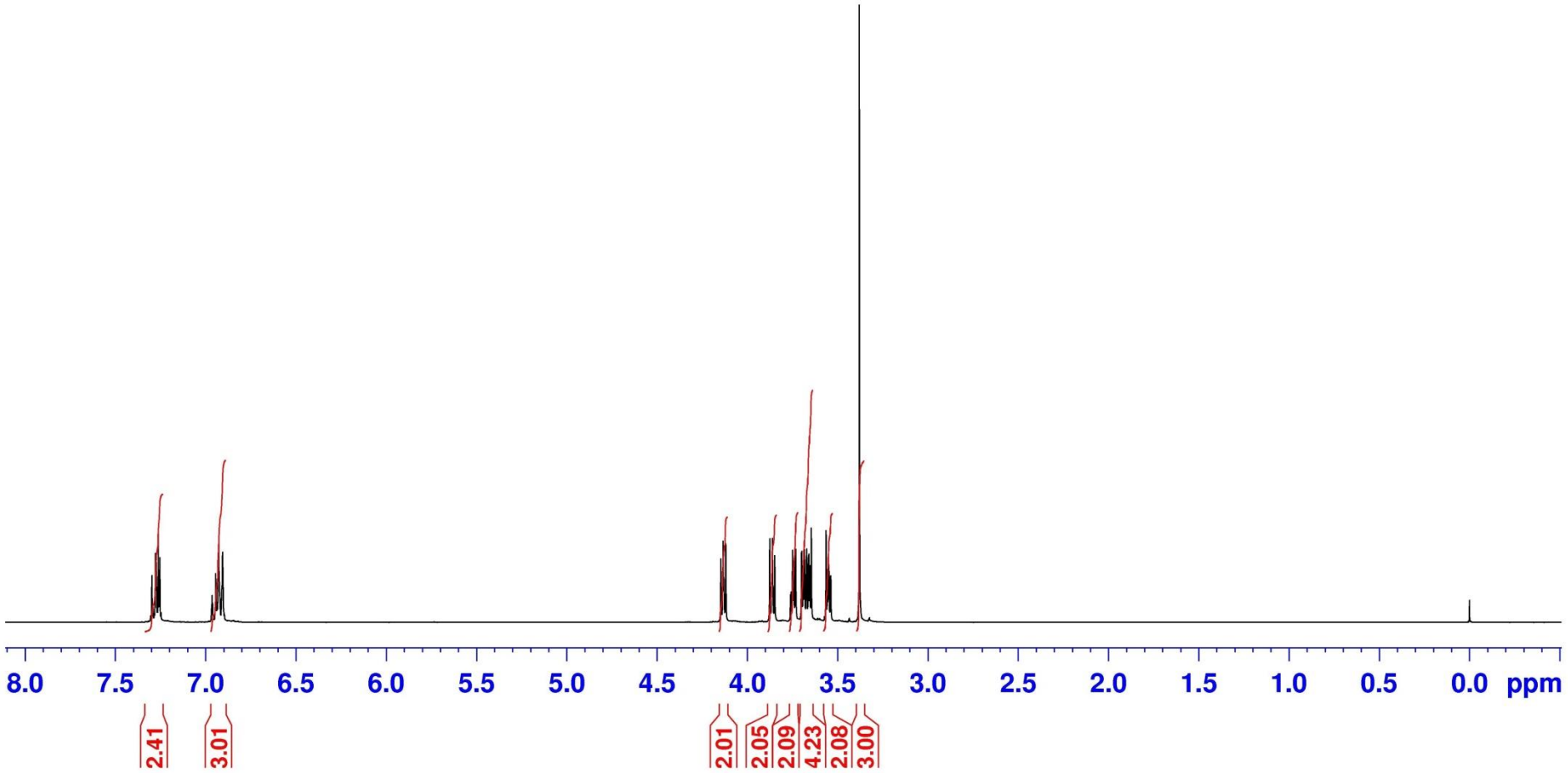


Figure A1 - 14(a): ^{1}H NMR spectra of **14** conducted in $CDCl_3$.

(2-(2-(2-methoxyethoxy)ethoxy)ethoxy)benzene

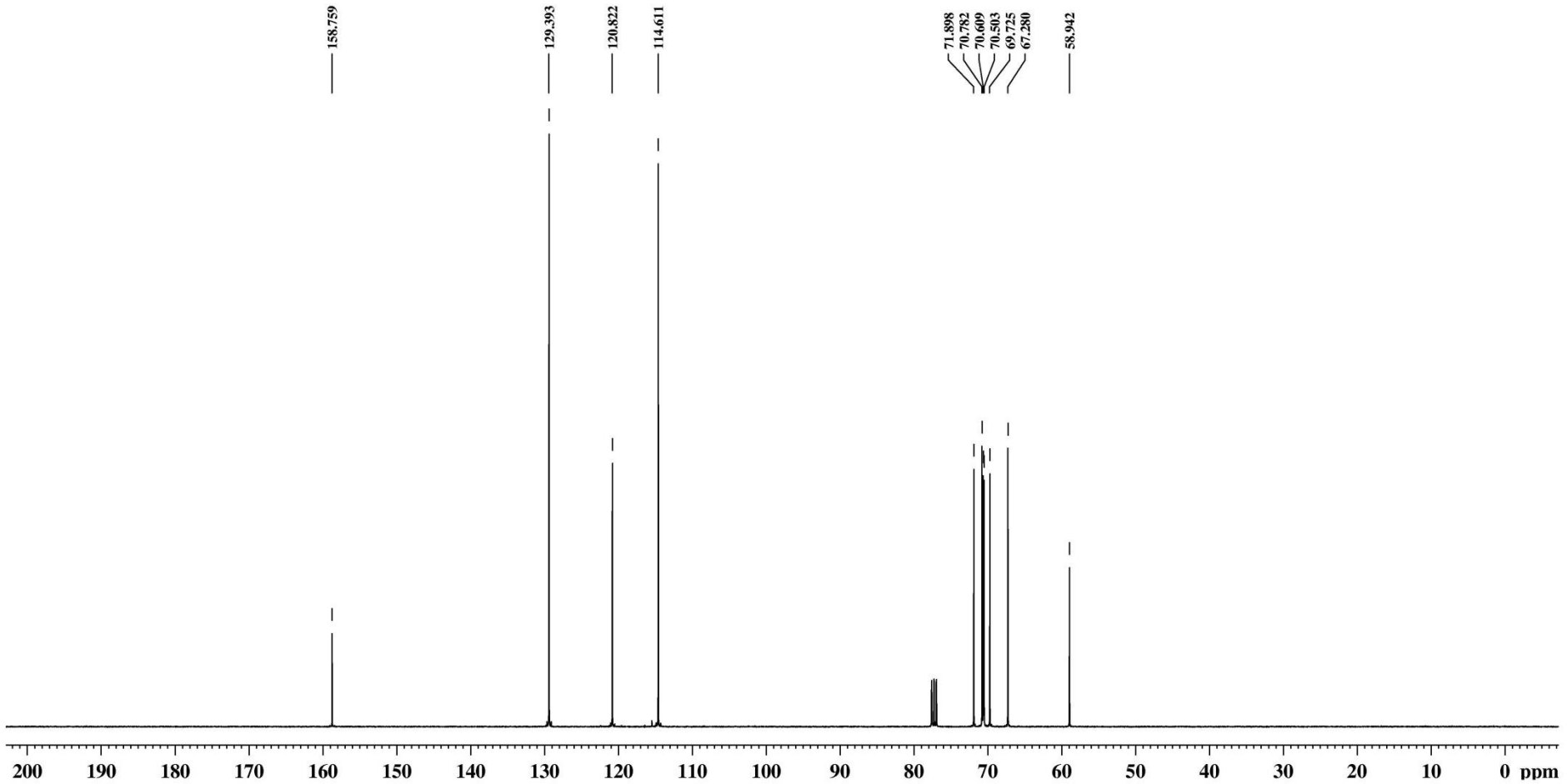


Figure A1 - 14(b): ^{13}C NMR spectra of **14** conducted in $CDCl_3$.

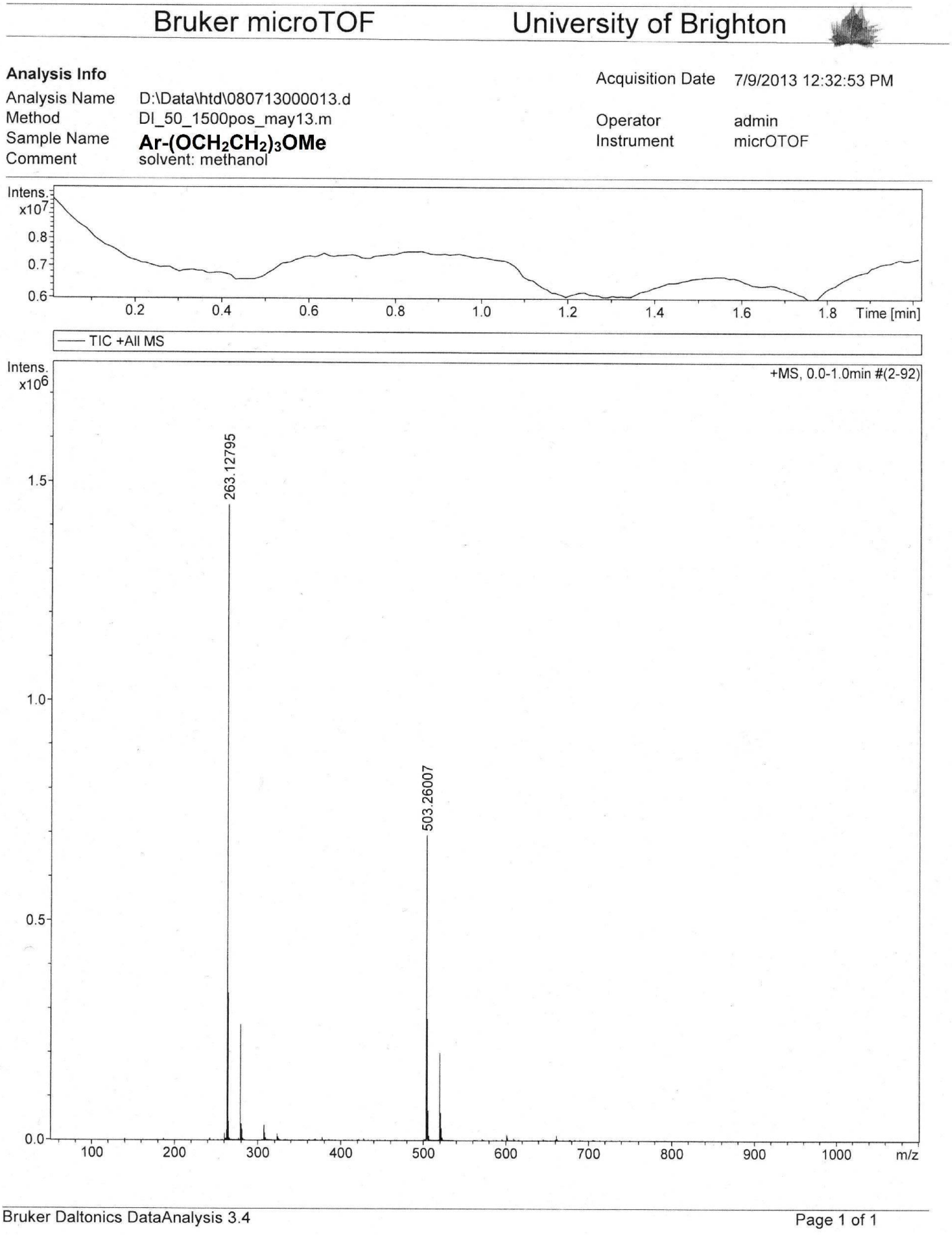


Figure A1 - 14(c): Mass spectra of **14** conducted in methanol.

1-(tert-butyl)-4-(2-(2-(2-methoxyethoxy)ethoxy)ethoxy)benzene

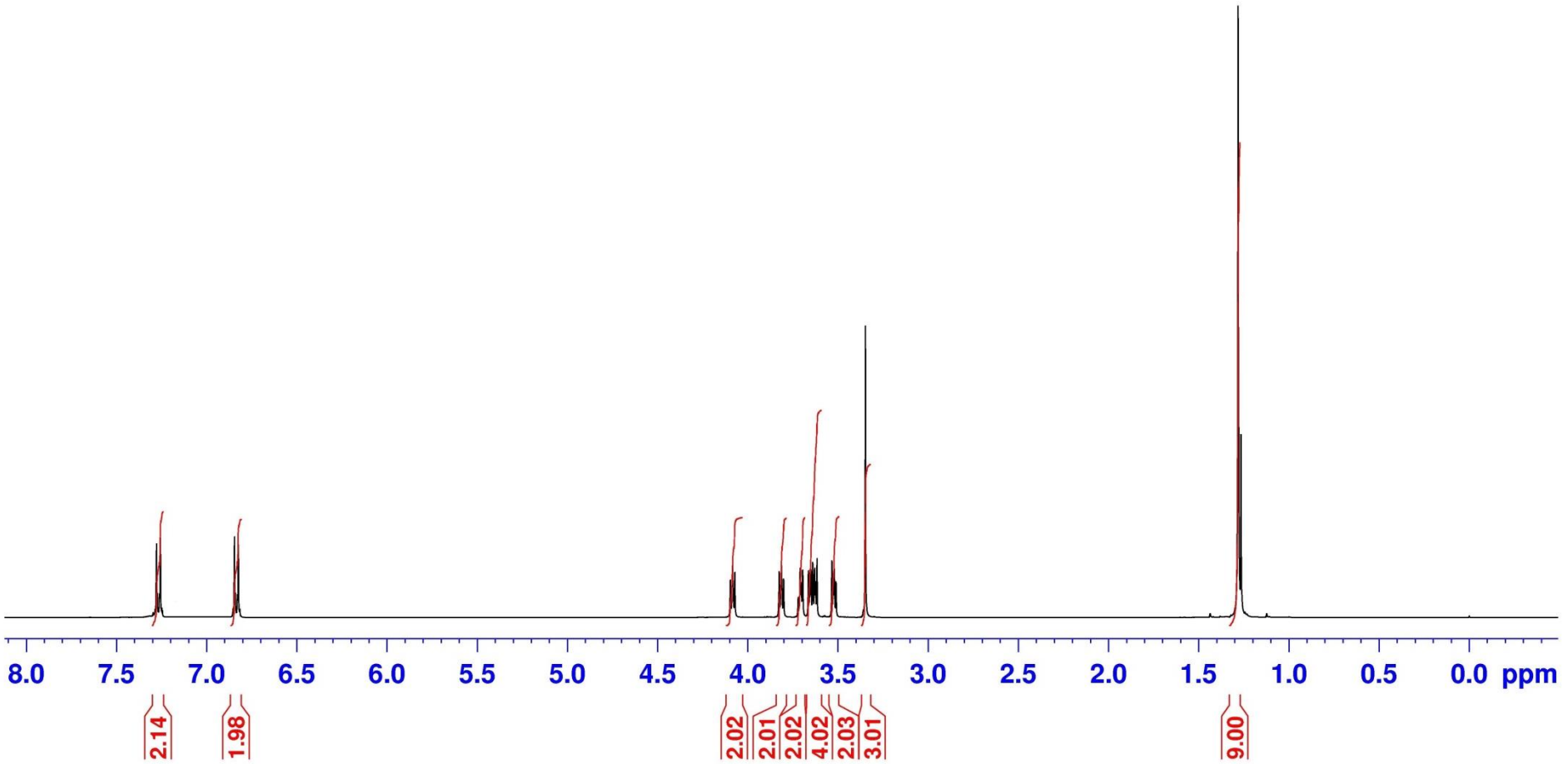


Figure A1 - 15(a): ^{1}H NMR spectra of **15** conducted in $CDCl_3$.

1-(tert-butyl)-4-(2-(2-(2-methoxyethoxy)ethoxy)ethoxy)benzene

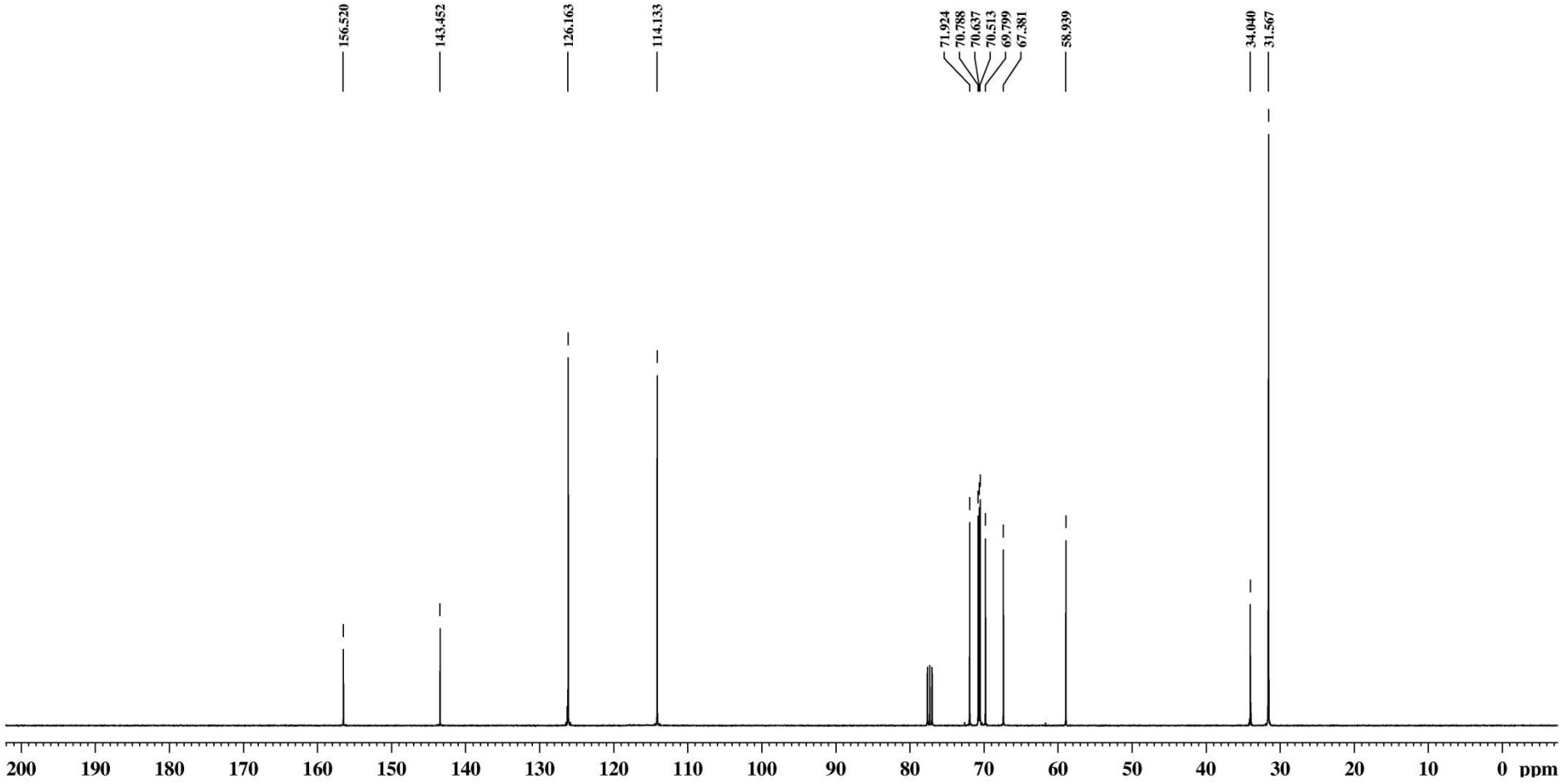


Figure A1 - 15(b): ^{13}C NMR spectra of **15** conducted in $CDCl_3$.

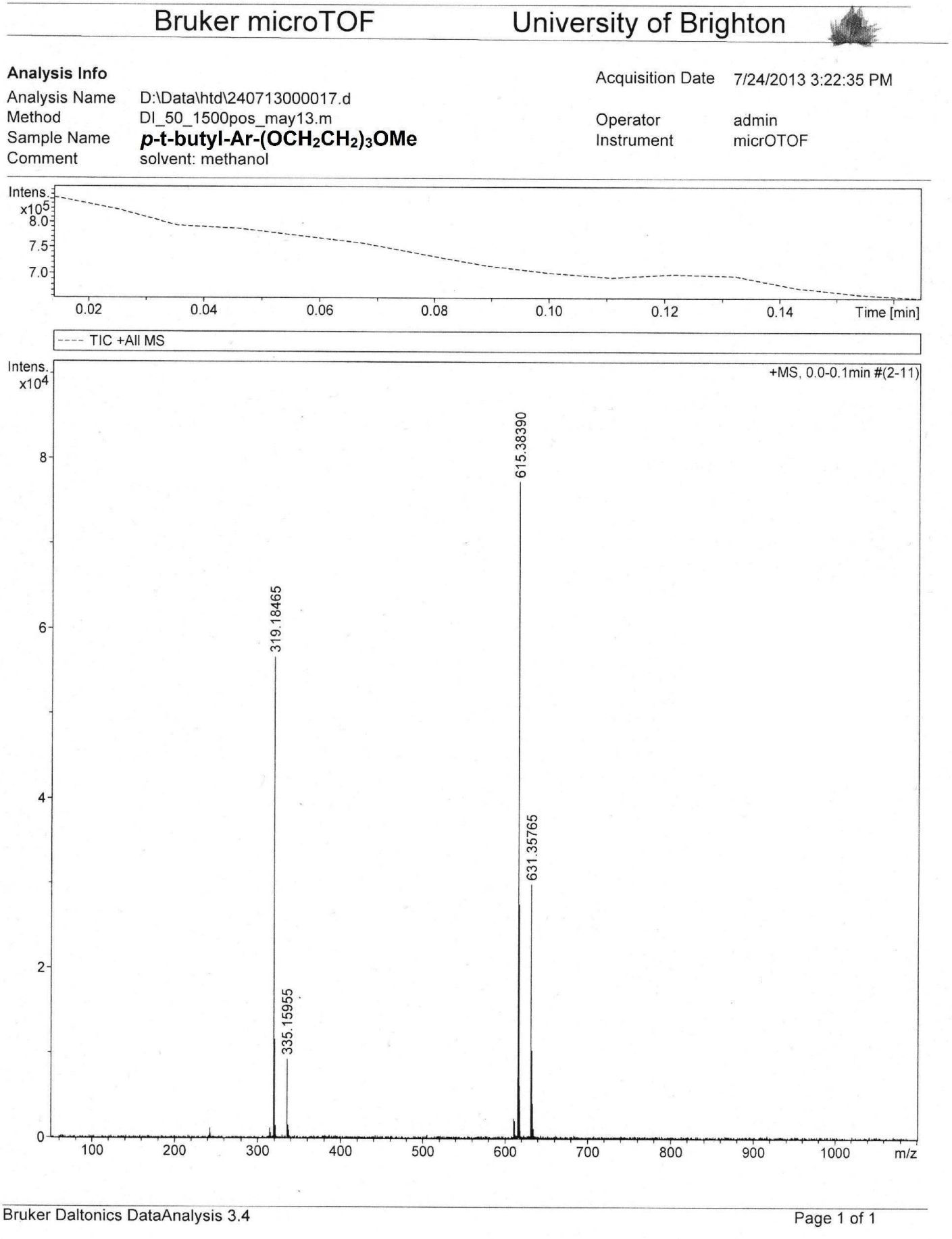


Figure A1 - 15(c): Mass spectra of **15** conducted in methanol.

1,4-bis(2-(2-(2-methoxyethoxy)ethoxy)ethoxy)benzene

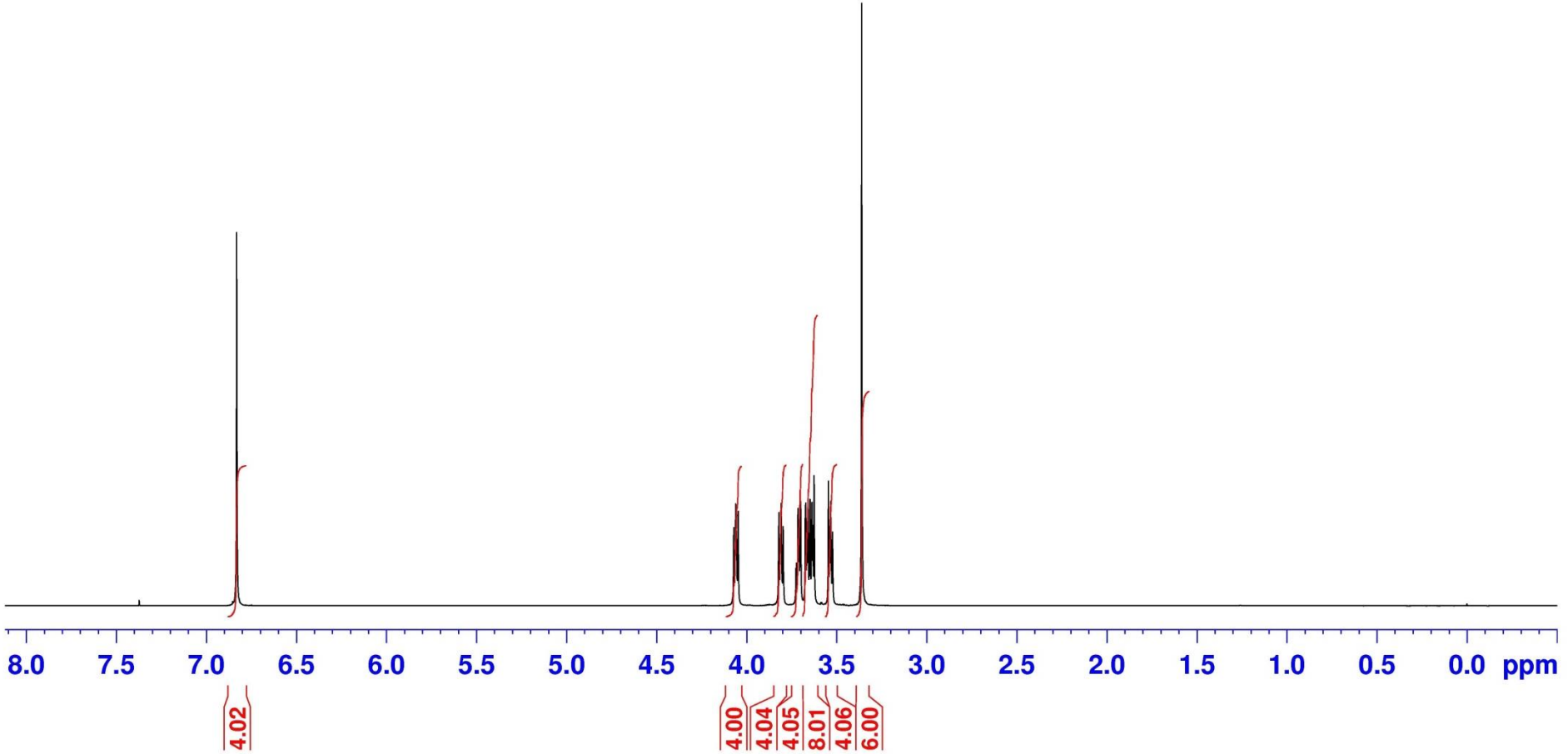


Figure A1 - 16(a): ^{1}H NMR spectra of **16** conducted in $CDCl_3$.

1,4-bis(2-(2-(2-methoxyethoxy)ethoxy)ethoxy)benzene

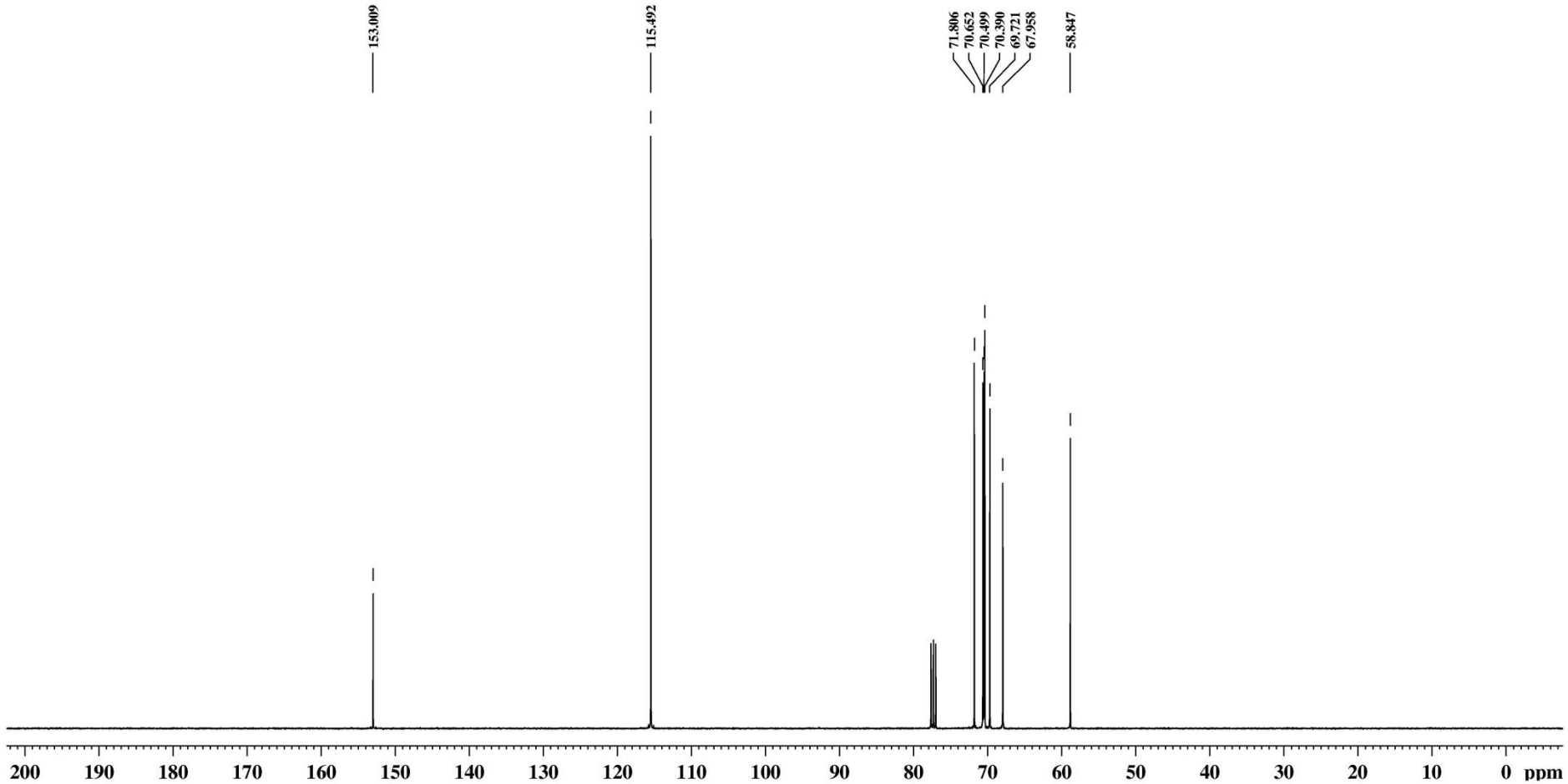


Figure A1 - 16(b): ^{13}C NMR spectra of **16** conducted in $CDCl_3$.

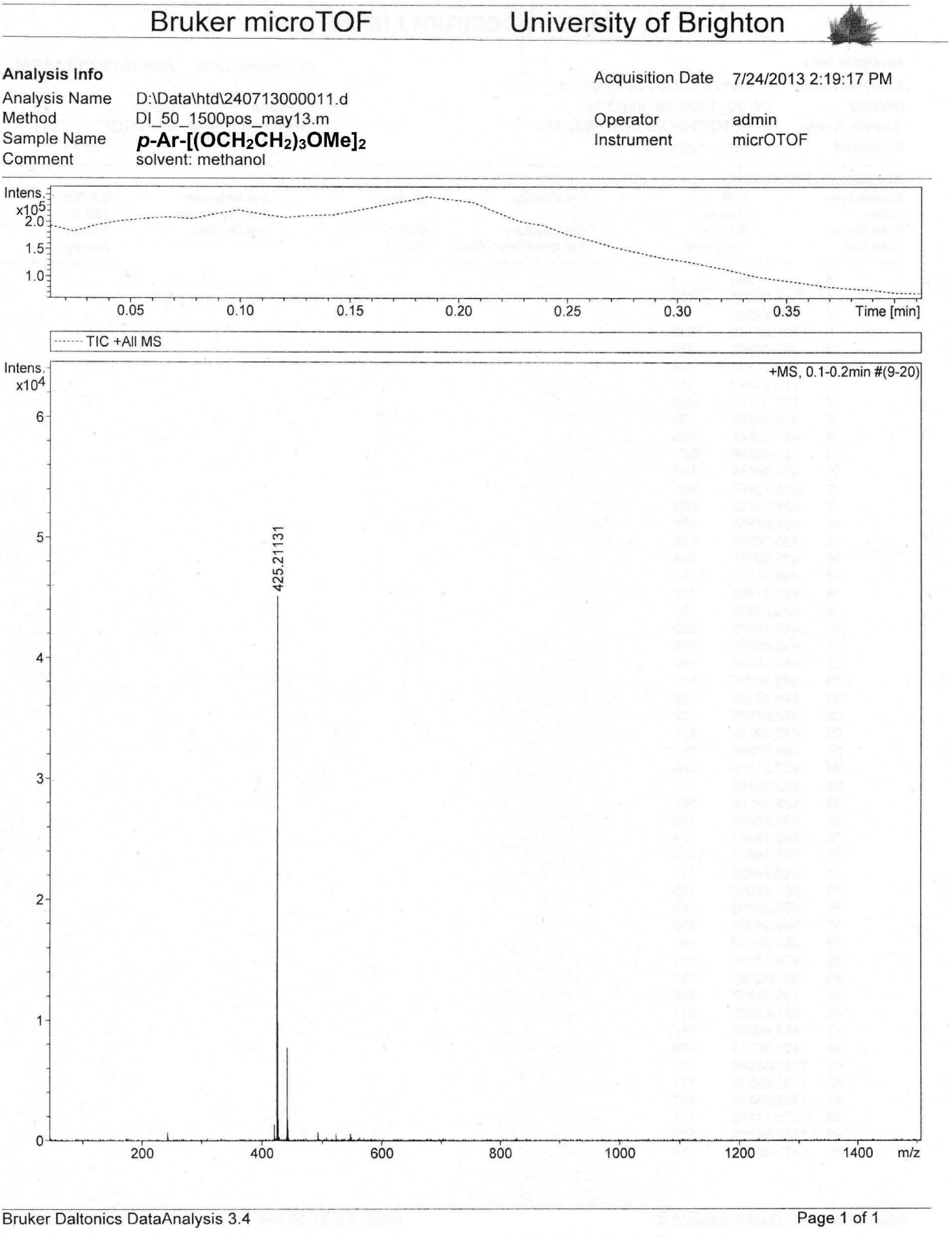


Figure A1 - 16(c): Mass spectra of **16** conducted in methanol.

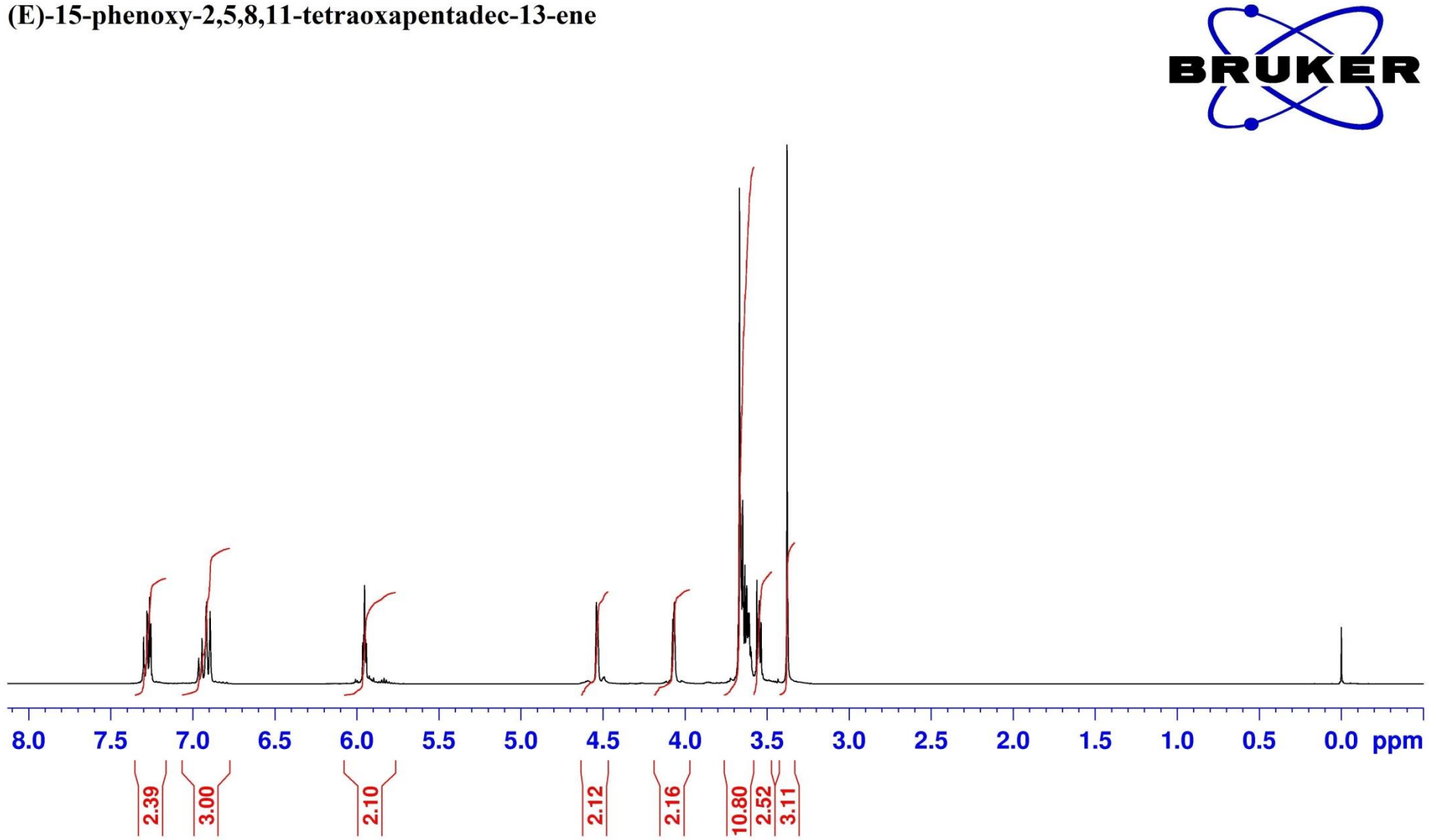


Figure A1 - 17(a): ^{1}H NMR spectra of **17** conducted in $CDCl_3$.

(E)-15-phenoxy-2,5,8,11-tetraoxapentadec-13-ene

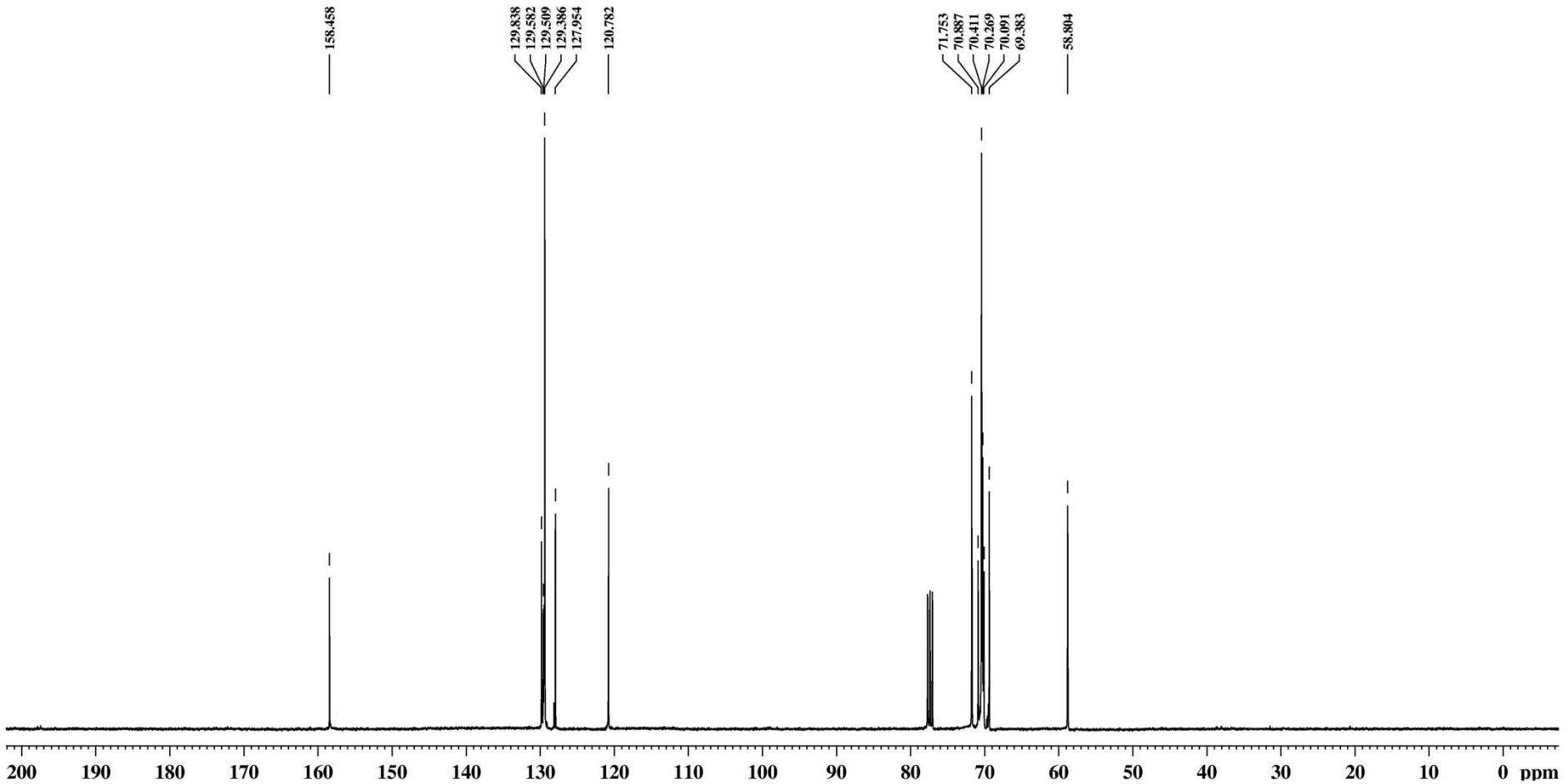


Figure A1 - 17(b): ^{13}C NMR spectra of **17** conducted in $CDCl_3$.

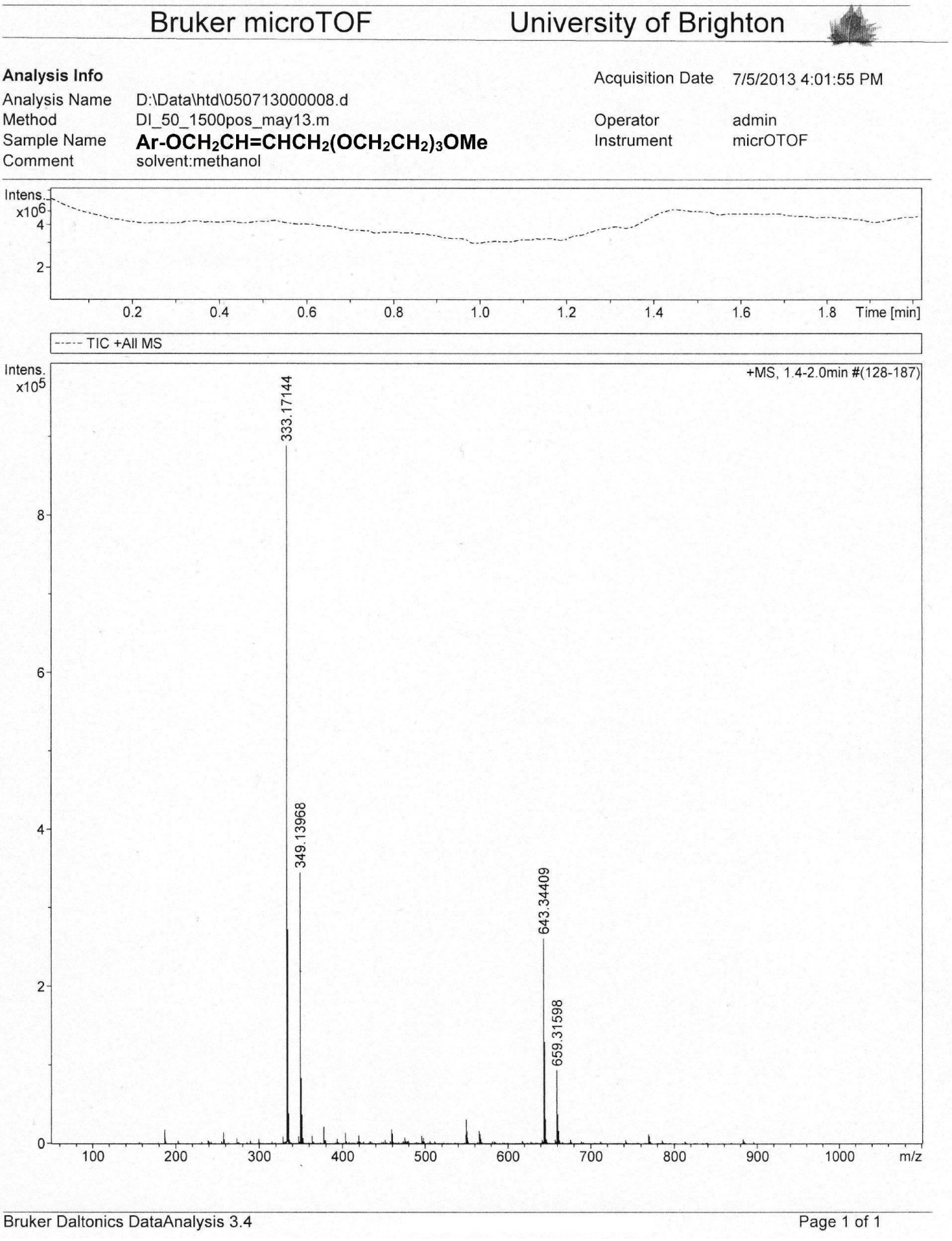


Figure A1 - 17(c): Mass spectra of **17** conducted in methanol.

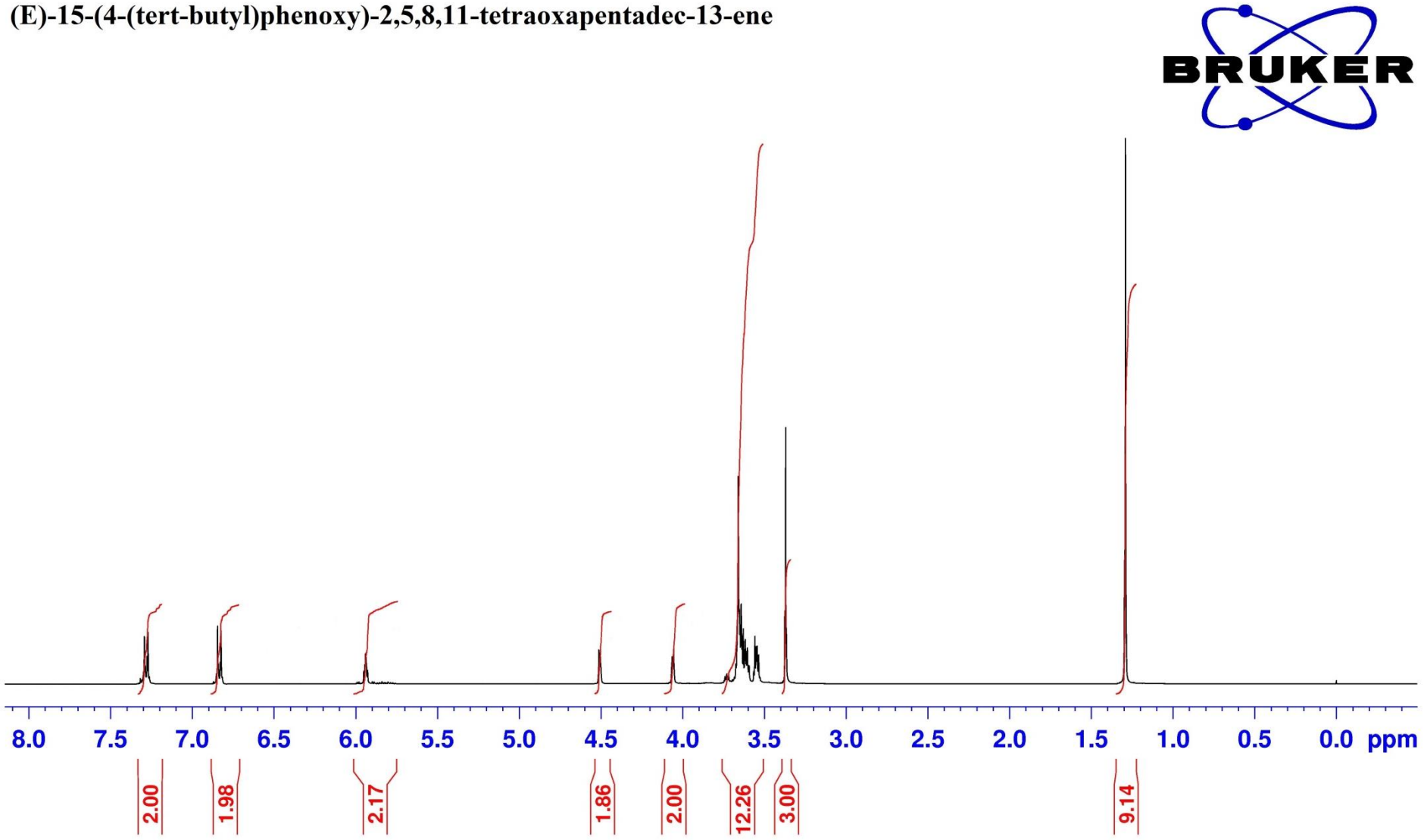


Figure A1 - 18(a): ^{1}H NMR spectra of **18** conducted in $CDCl_3$.

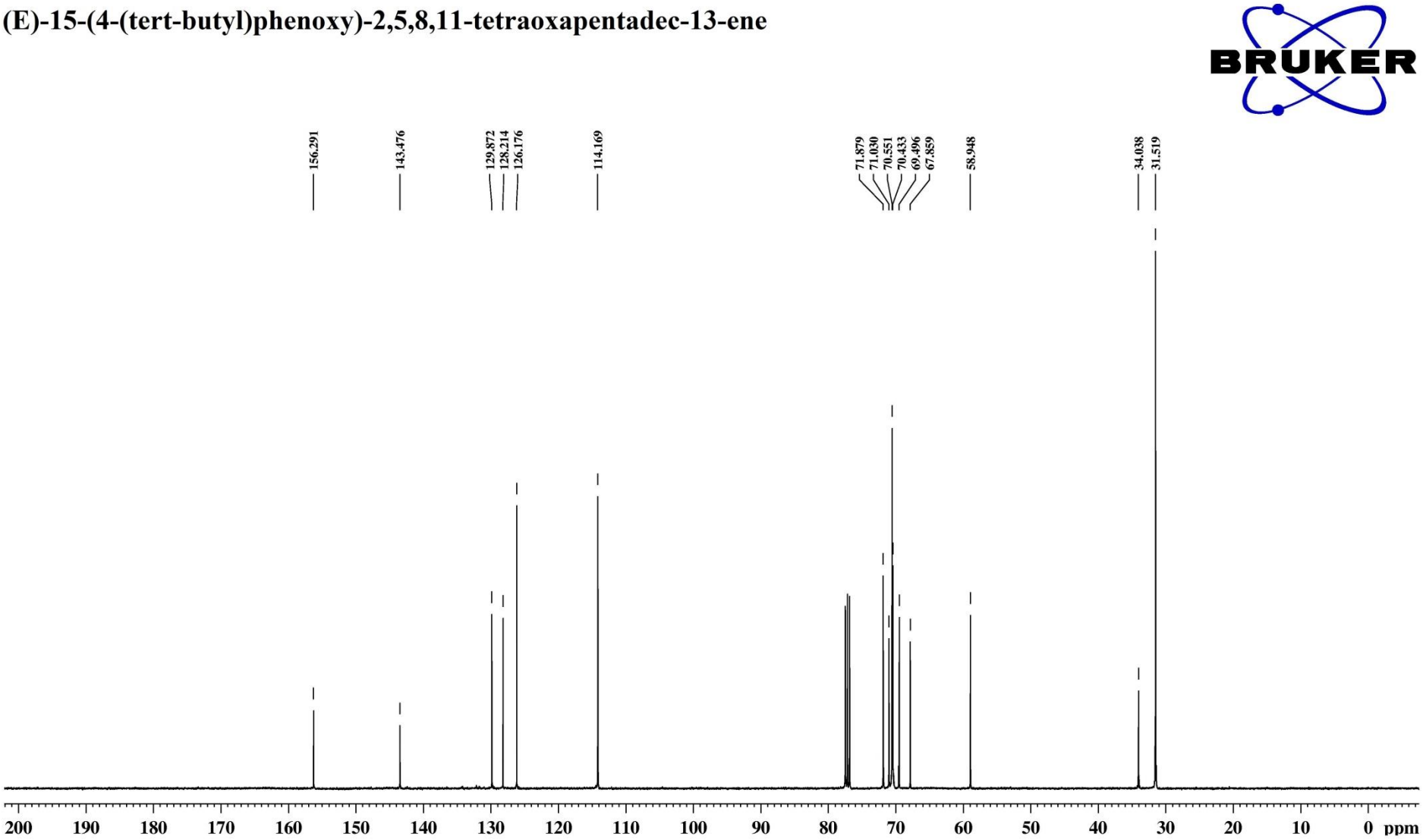


Figure A1 - 18(b): ^{13}C NMR spectra of **18** conducted in $CDCl_3$.

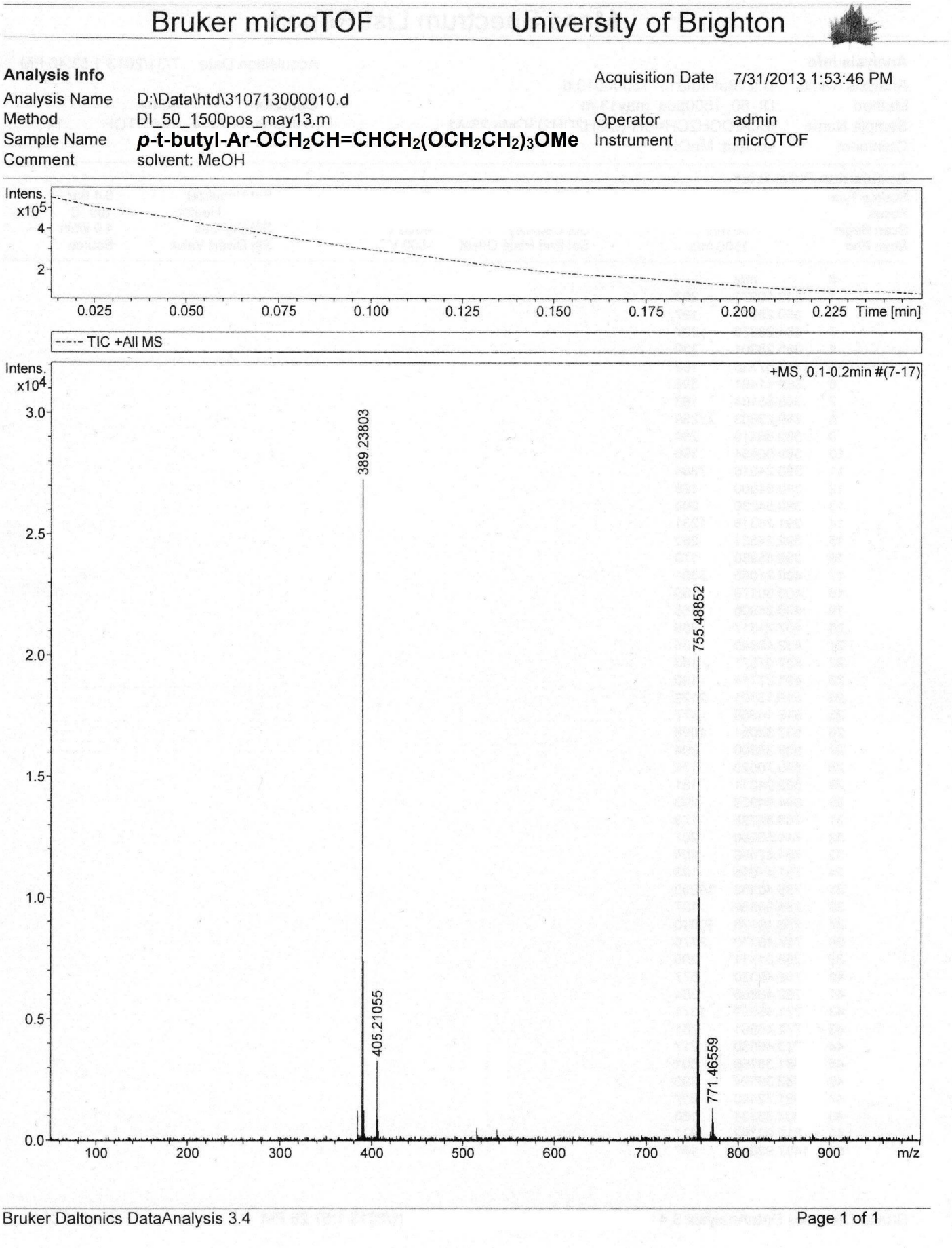


Figure A1 - 18(c): Mass spectra of **18** conducted in methanol.

1,4-bis(((E)-2,5,8,11-tetraoxapentadec-13-en-15-yl)oxy)benzene

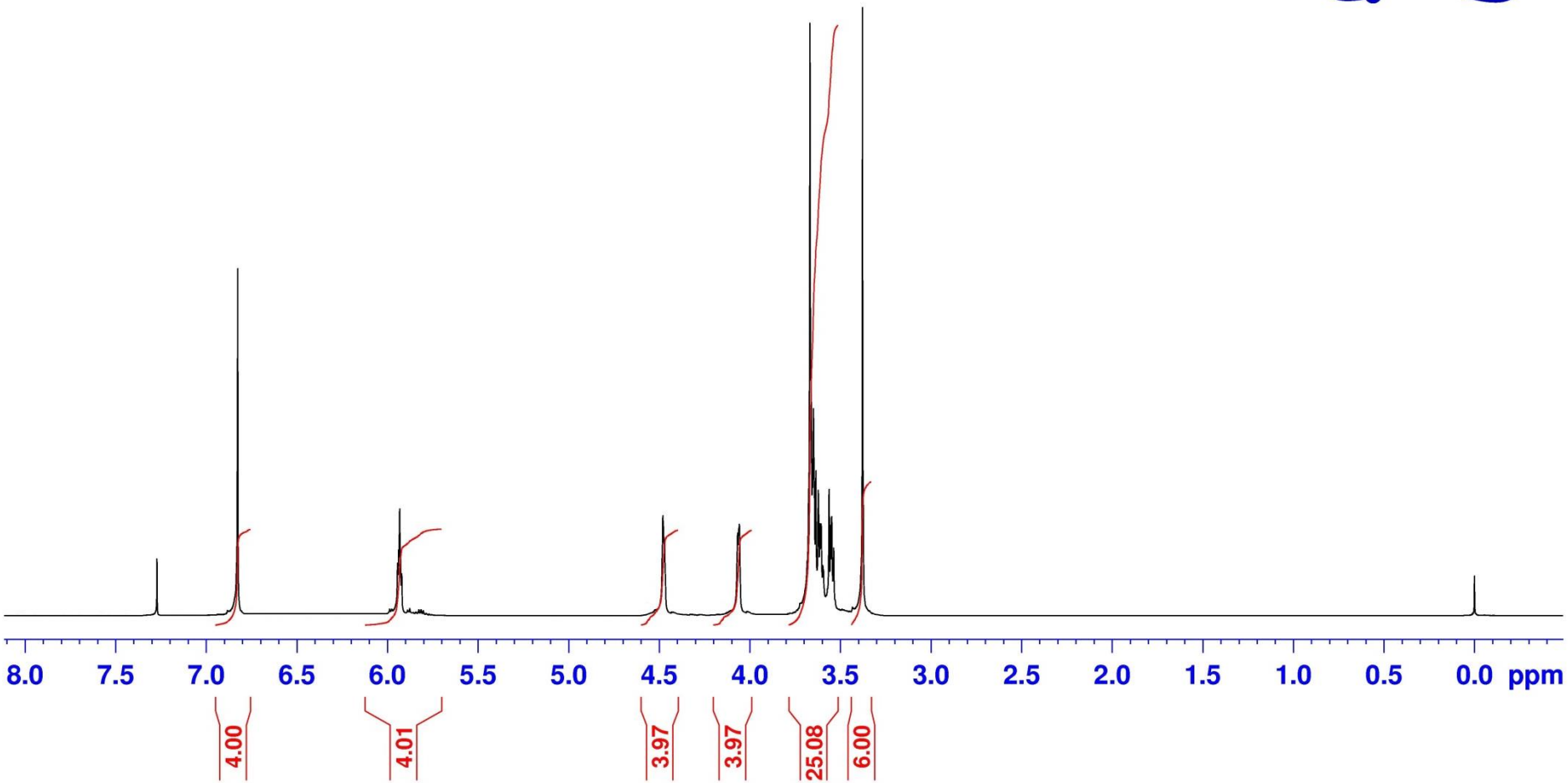


Figure A1 - 19(a): ^{1}H NMR spectra of **19** conducted in $CDCl_3$.

1,4-bis(((E)-2,5,8,11-tetraoxapentadec-13-en-15-yl)oxy)benzene

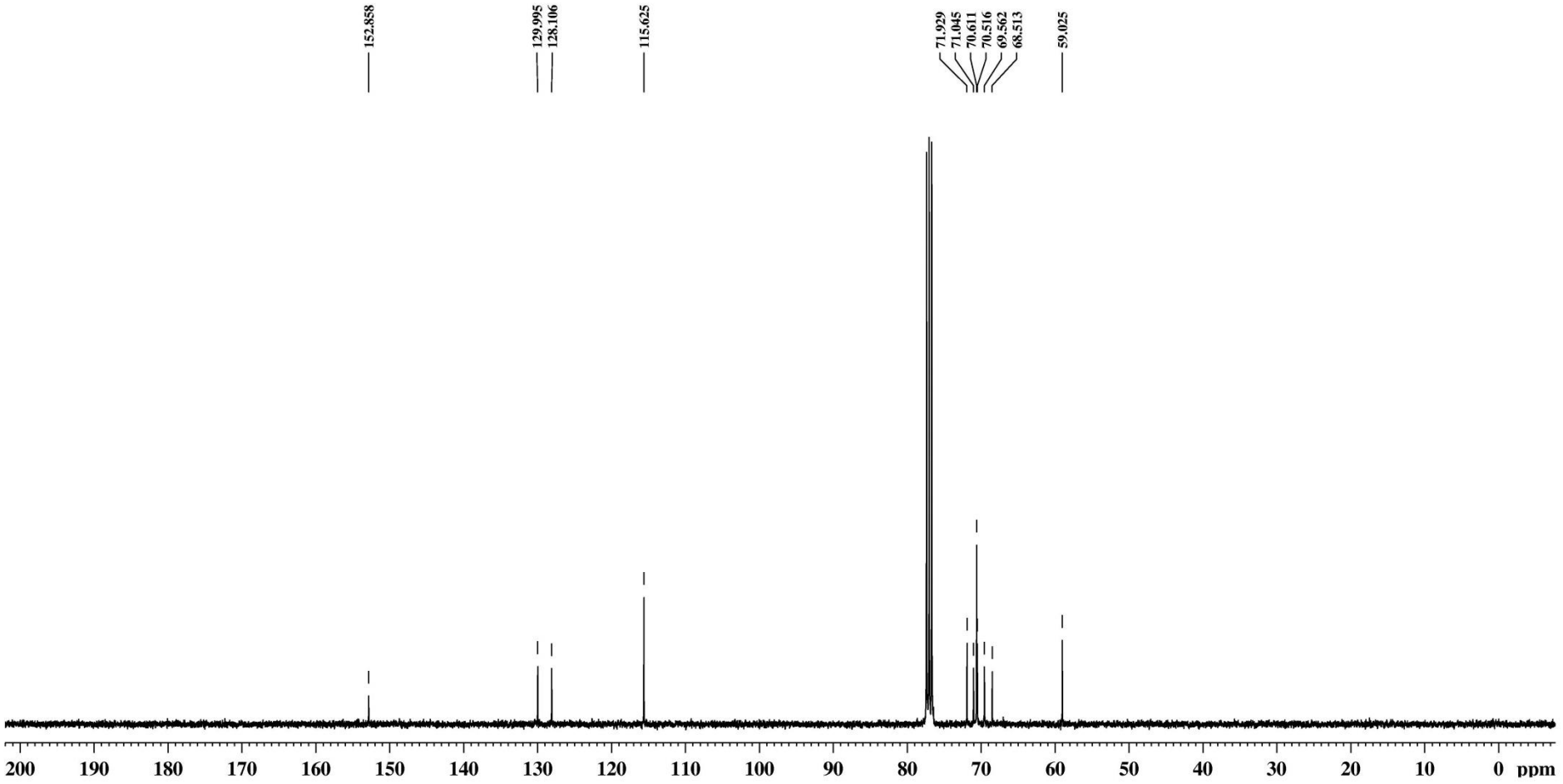


Figure A1 - 19(b): ^{13}C NMR spectra of **19** conducted in $CDCl_3$.

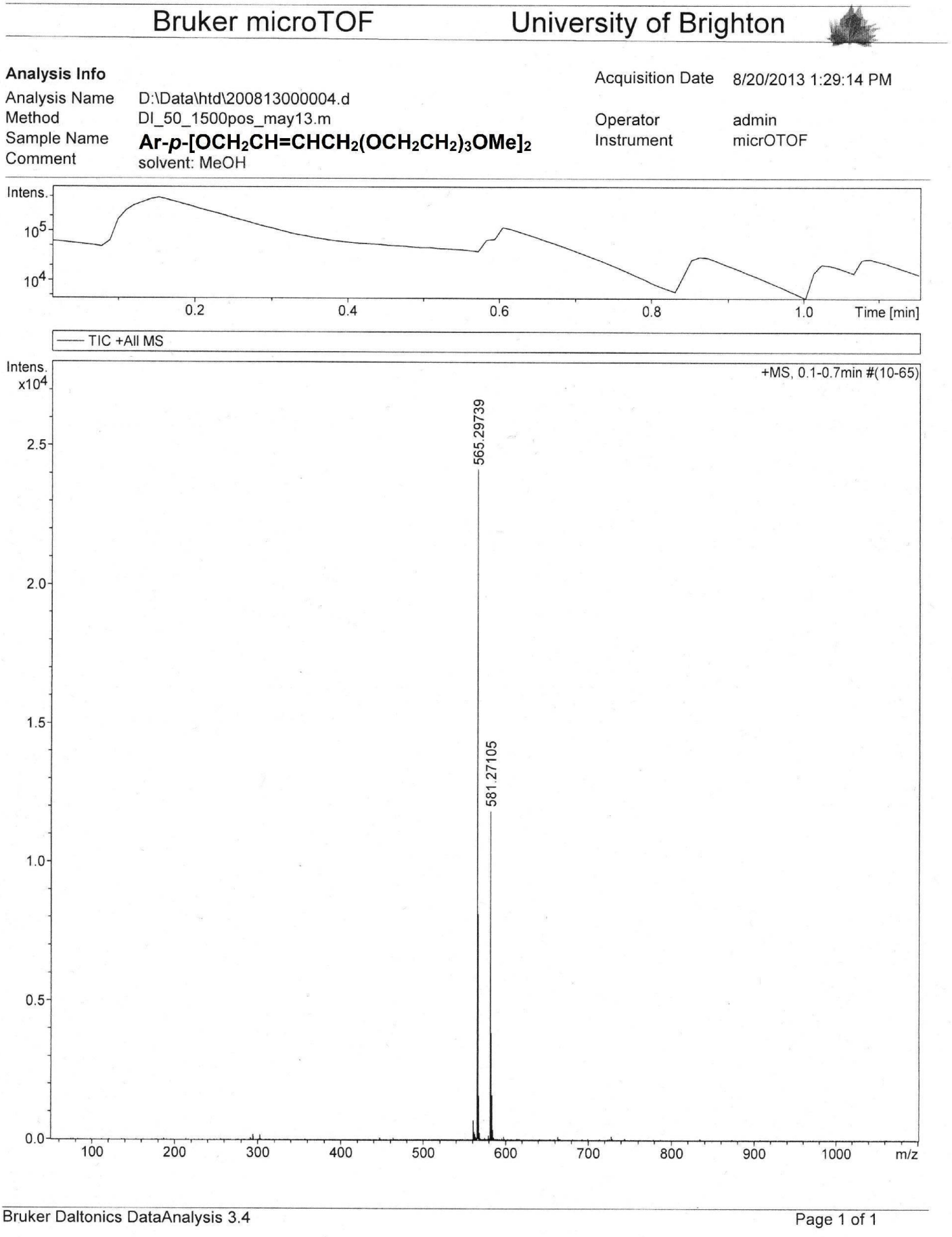


Figure A1 - 19(c): Mass spectra of **19** conducted in methanol.

Triethylene glycol iodide monomethyl ether

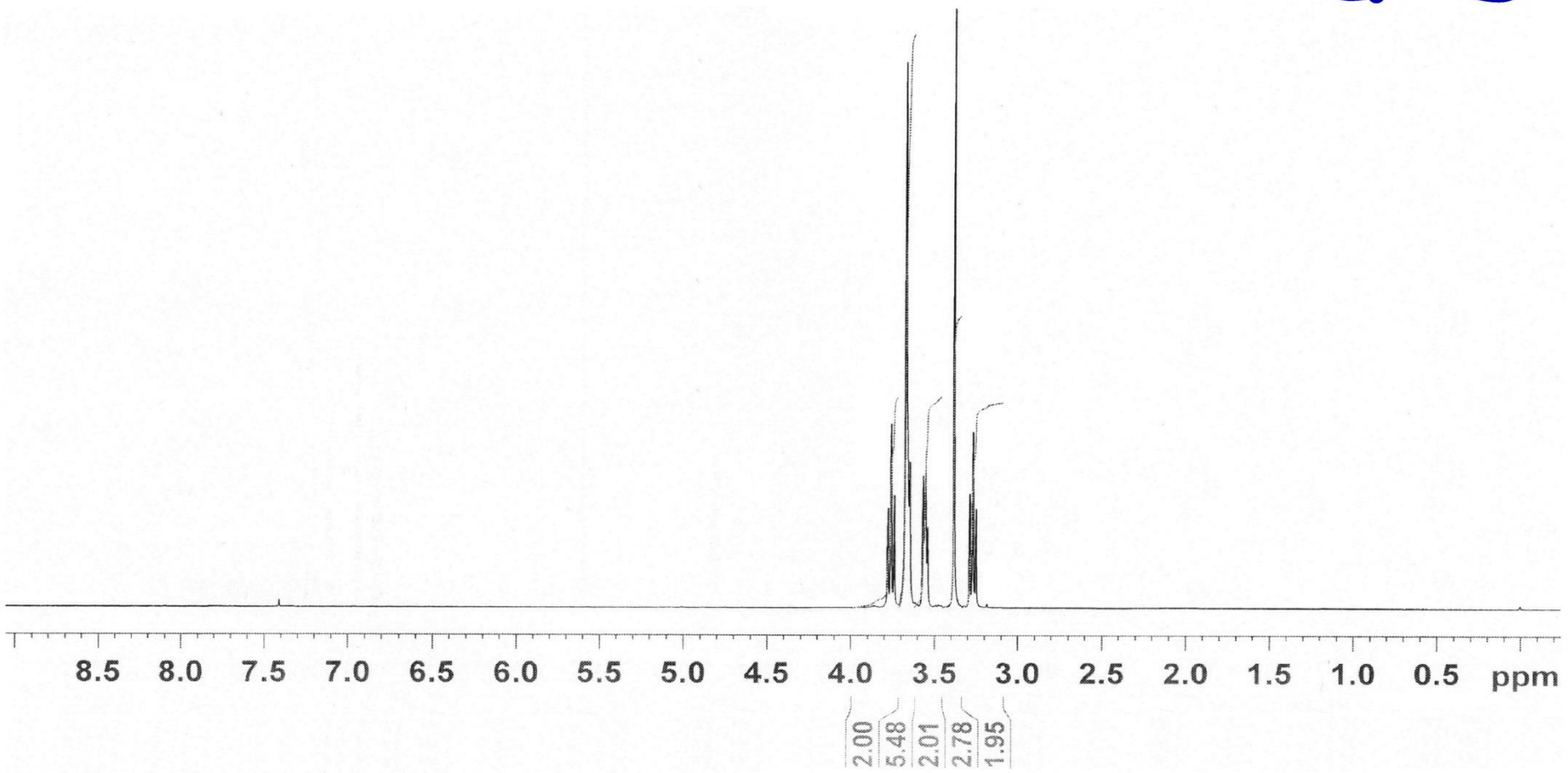


Figure A1 - 20(a): ^{1}H NMR spectra of **20** conducted in $CDCl_3$.

Triethylene glycol iodide monomethyl ether

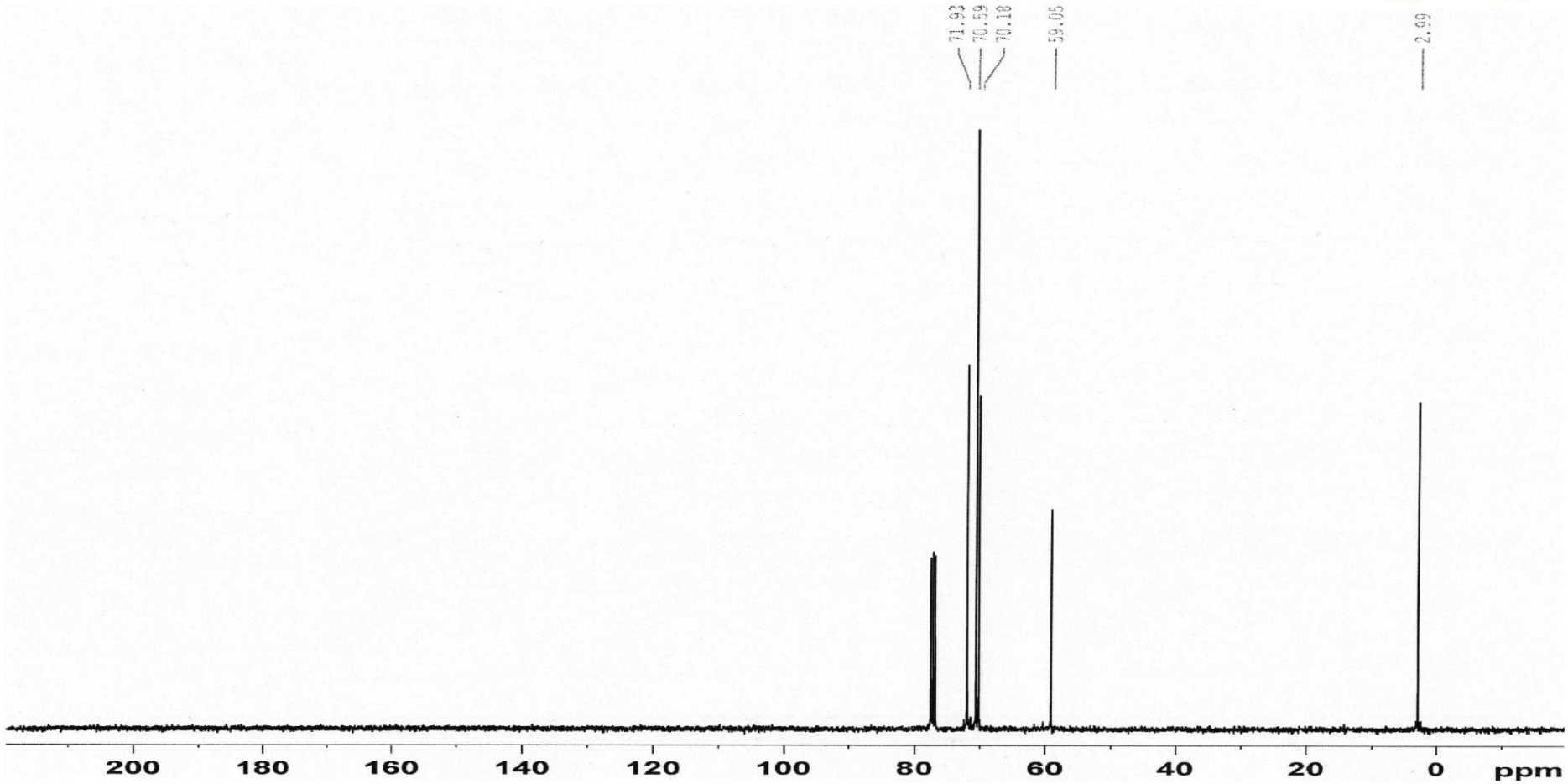


Figure A1 - 20(b): ^{13}C NMR spectra of **20** conducted in $CDCl_3$.

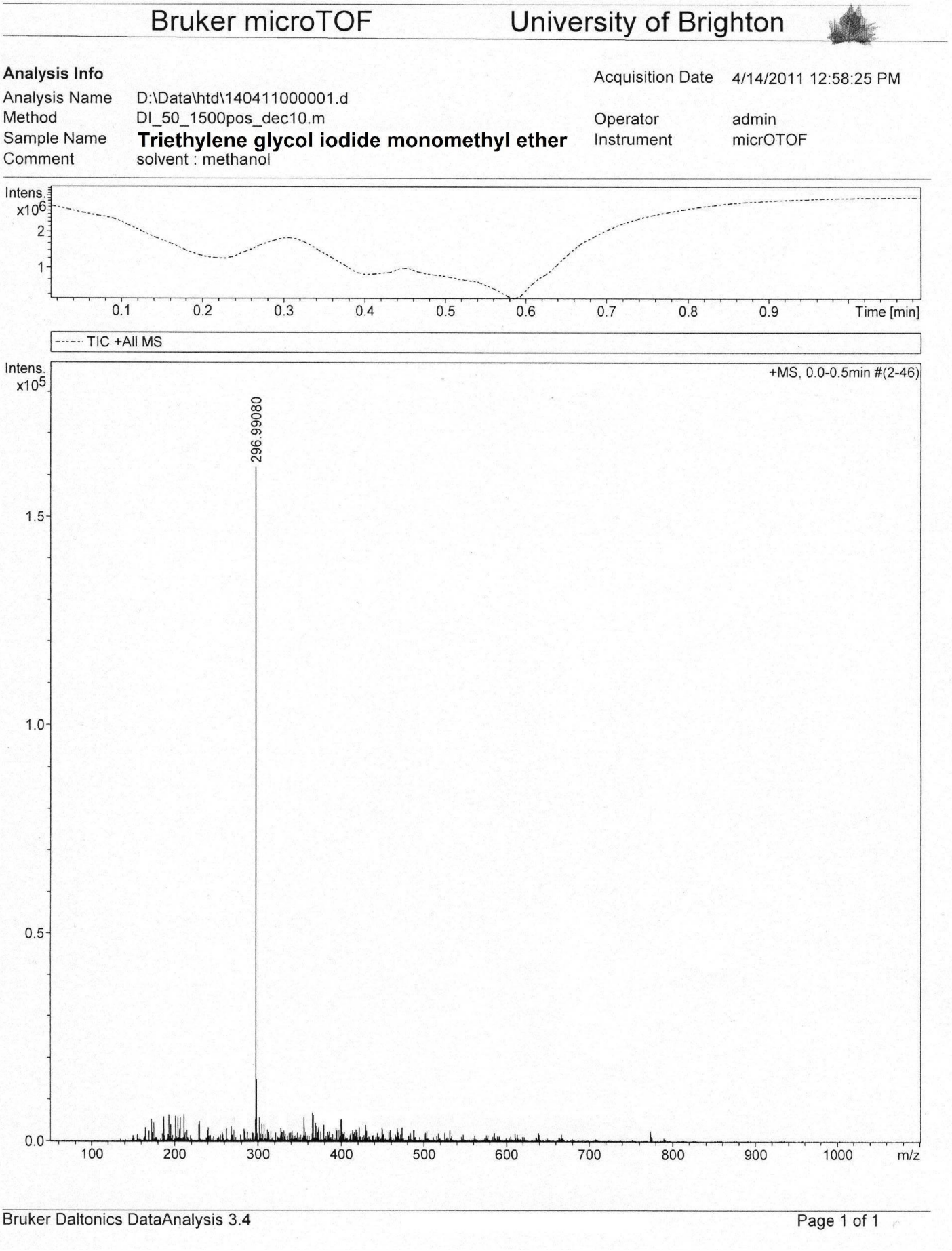


Figure A1 - 20(c): Mass spectra of **20** conducted in methanol.

Hydroquinone bis(2-tosylethoxyether)

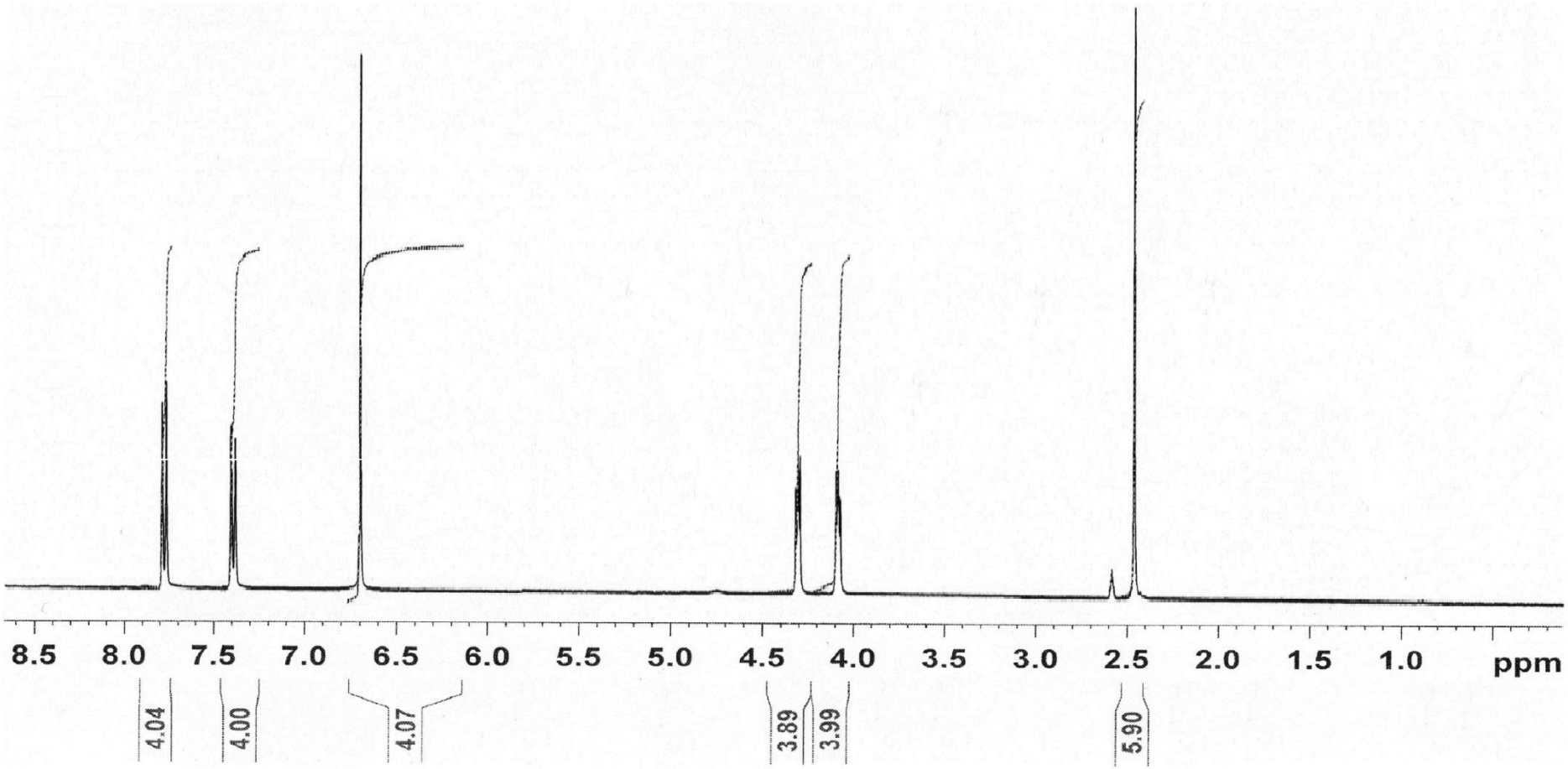


Figure A1 - 21(a): ^{13}C NMR spectra of **21** conducted in $CDCl_3$/DMSO.

Hydroquinone bis(2-tosylethoxyether)

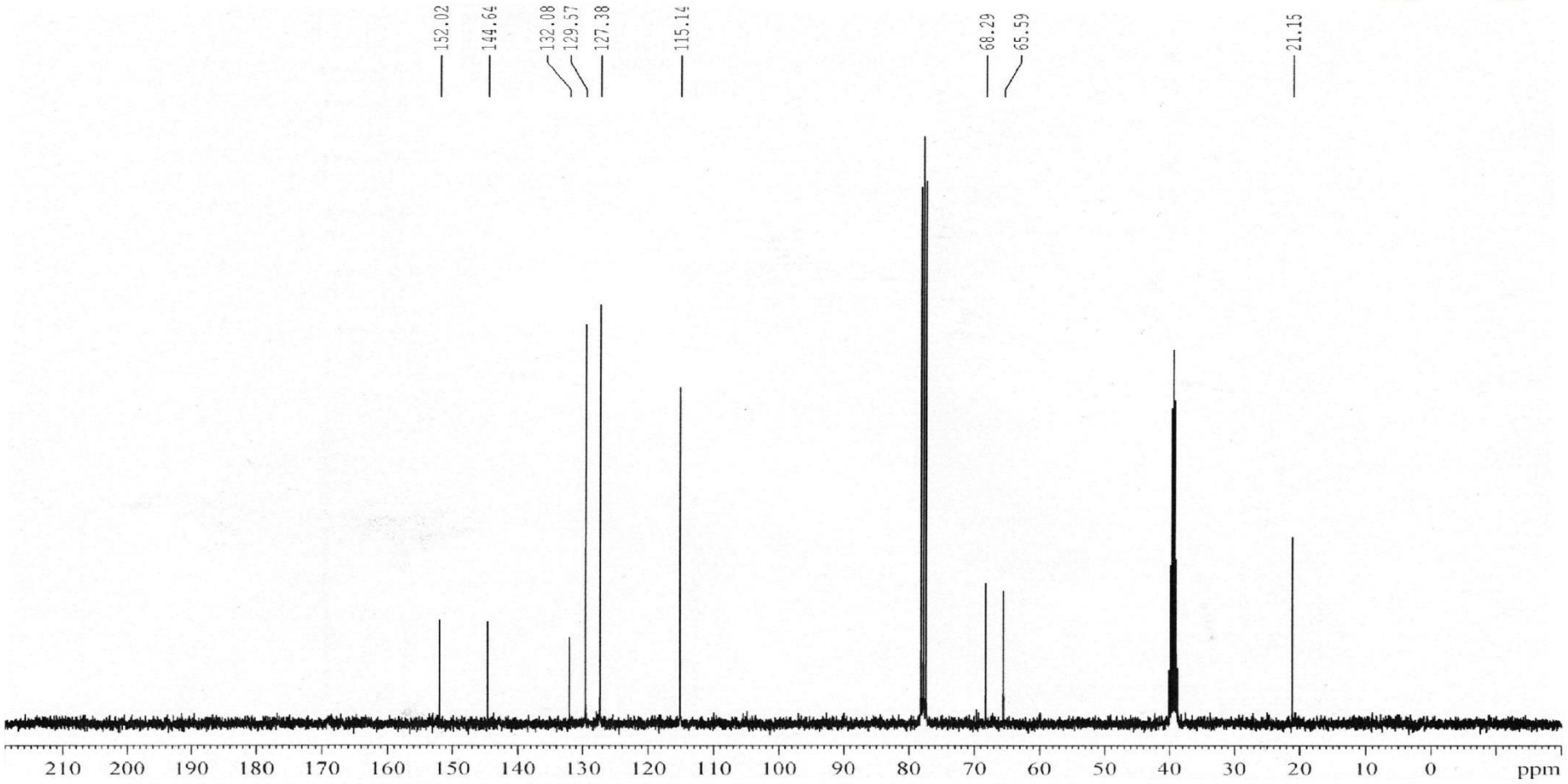


Figure A1 - 21(b): ^{13}C NMR spectra of **21** conducted in $CDCl_3$/DMSO.

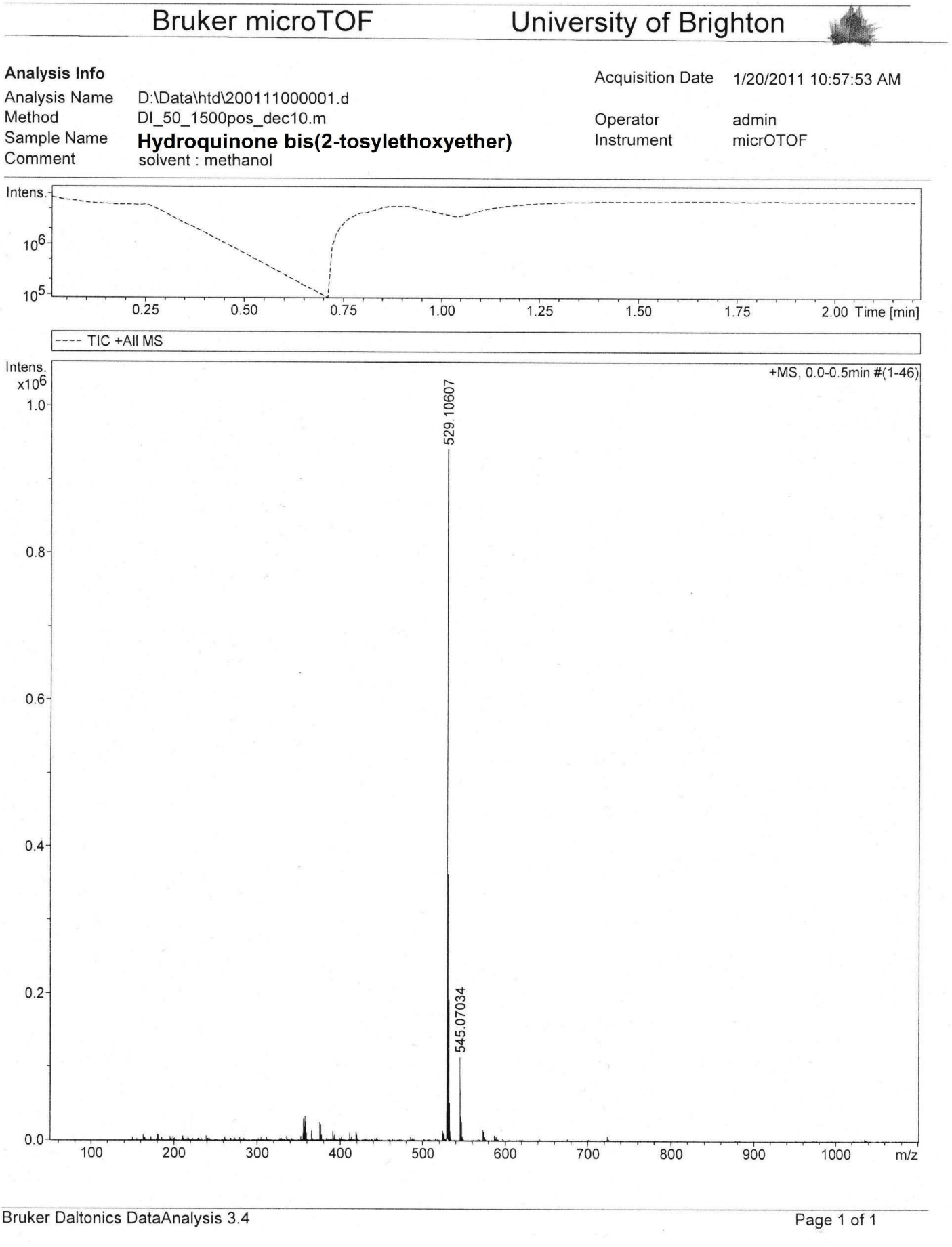


Figure A1 - 21(c): Mass spectra of **21** conducted in methanol.

1,4-Bis(2-bromoethoxy)benzene

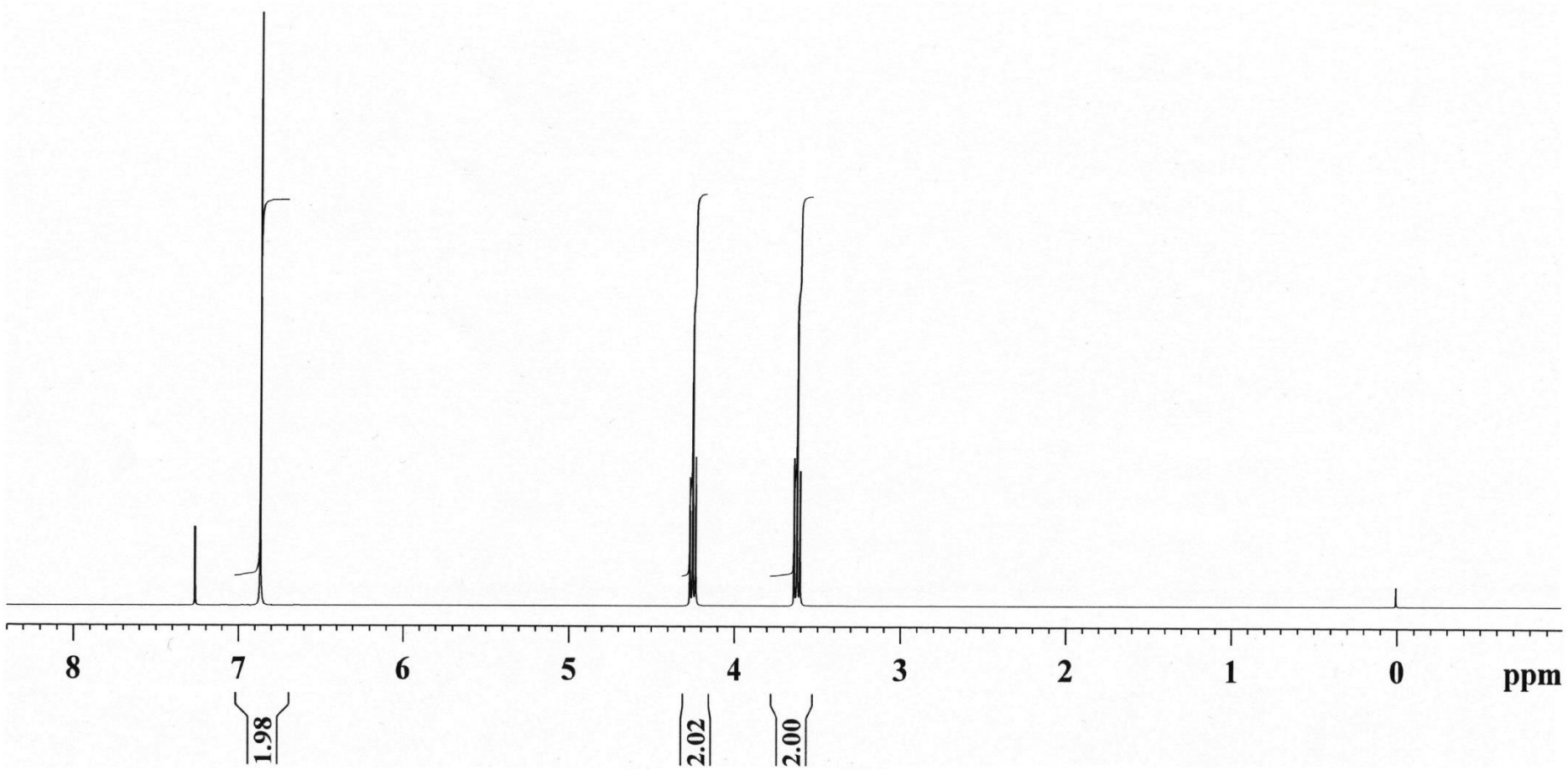


Figure A1 - 22(a): ^{1}H NMR spectra of **22** conducted in $CDCl_3$.

1,4-Bis(2-bromoethoxy)benzene

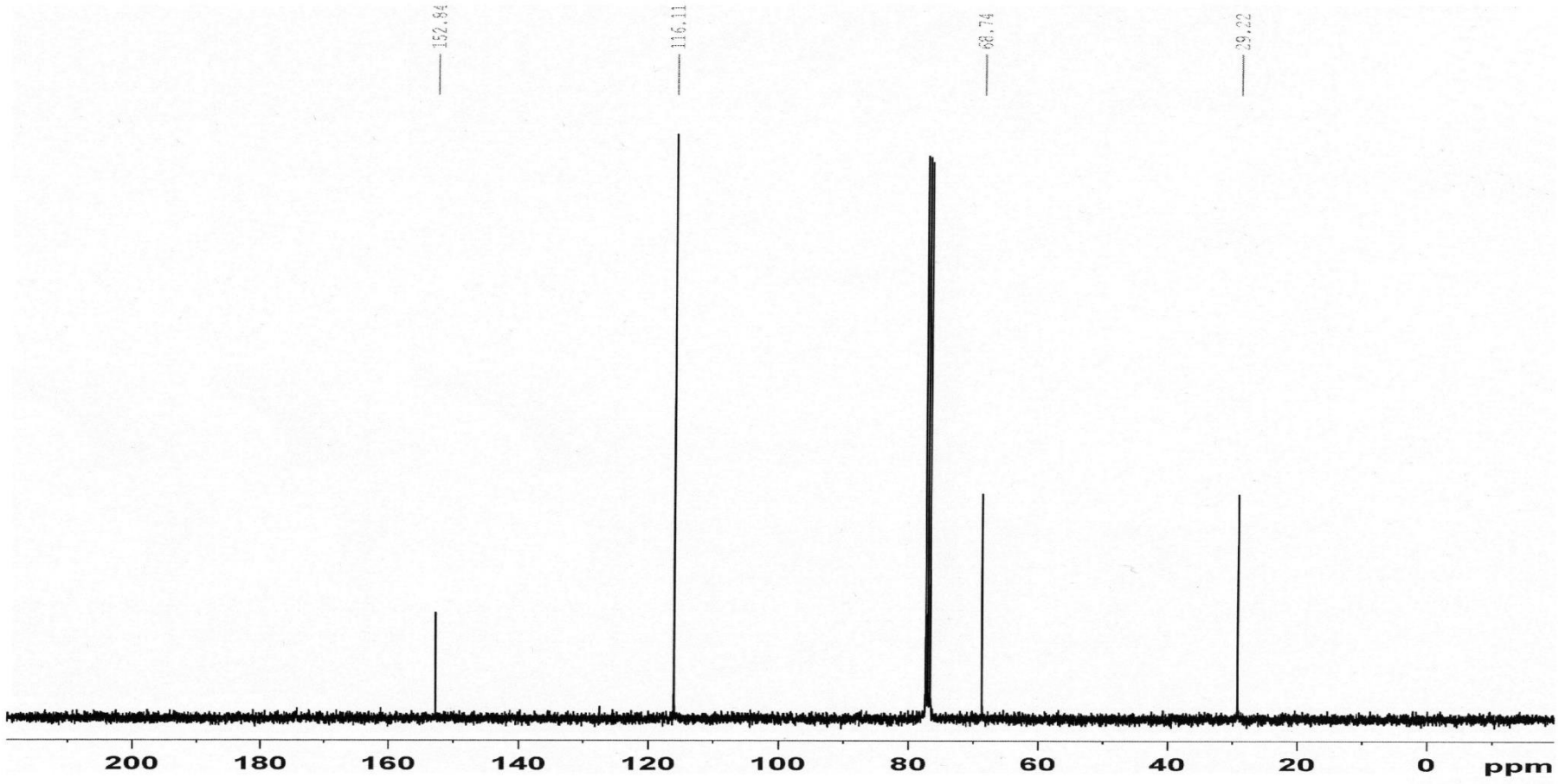


Figure A1 - 22(b): ^{13}C NMR spectra of **22** conducted in $CDCl_3$.

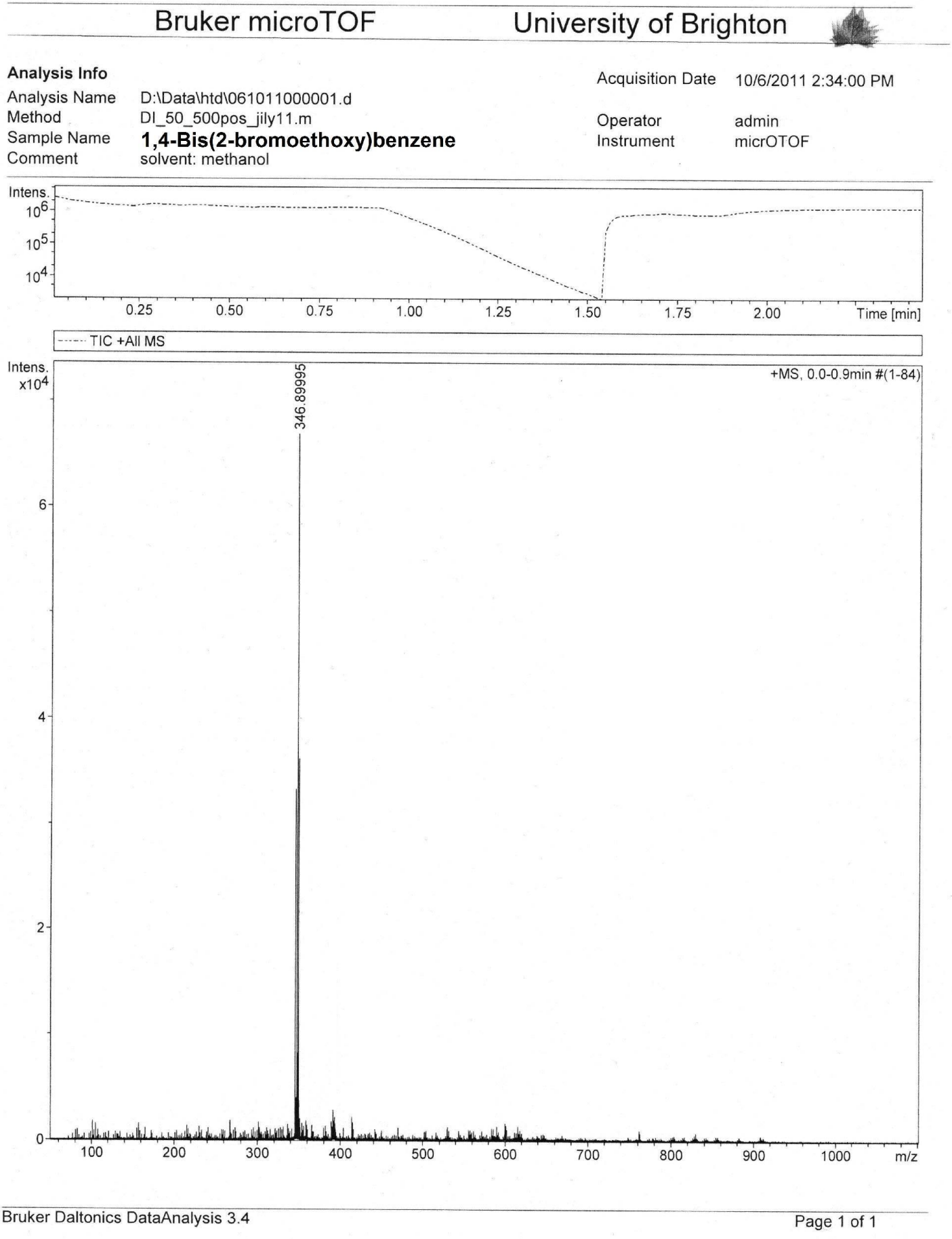


Figure A1 - 22(c): Mass spectra of **22** conducted in methanol.

1,4-Bis(2-bromoethoxy)pillar[5]arene

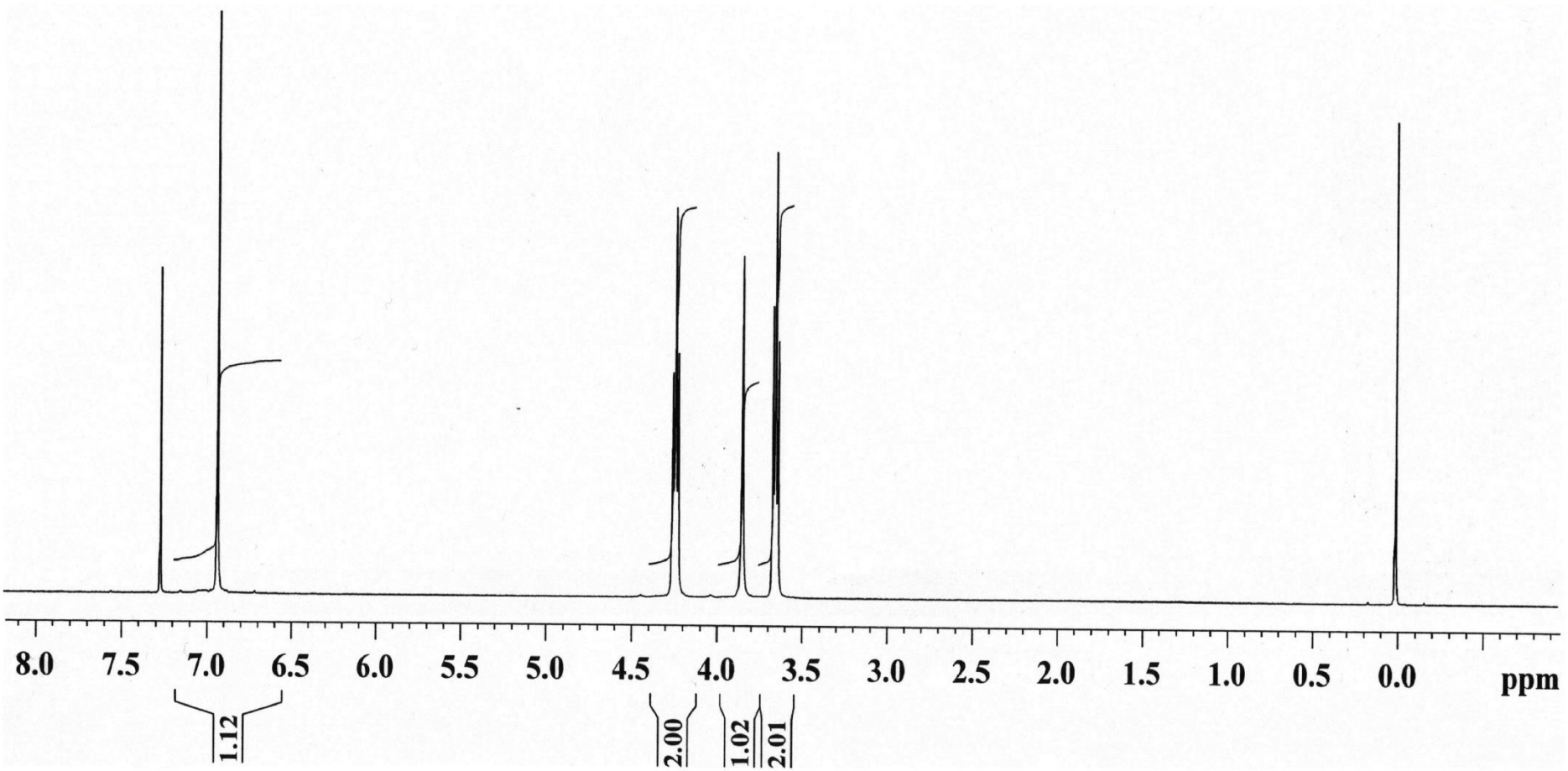


Figure A1 - 23(a): ^{1}H NMR spectra of **23** conducted in $CDCl_3$.

1,4-Bis(2-bromoethoxy)pillar[5]arene

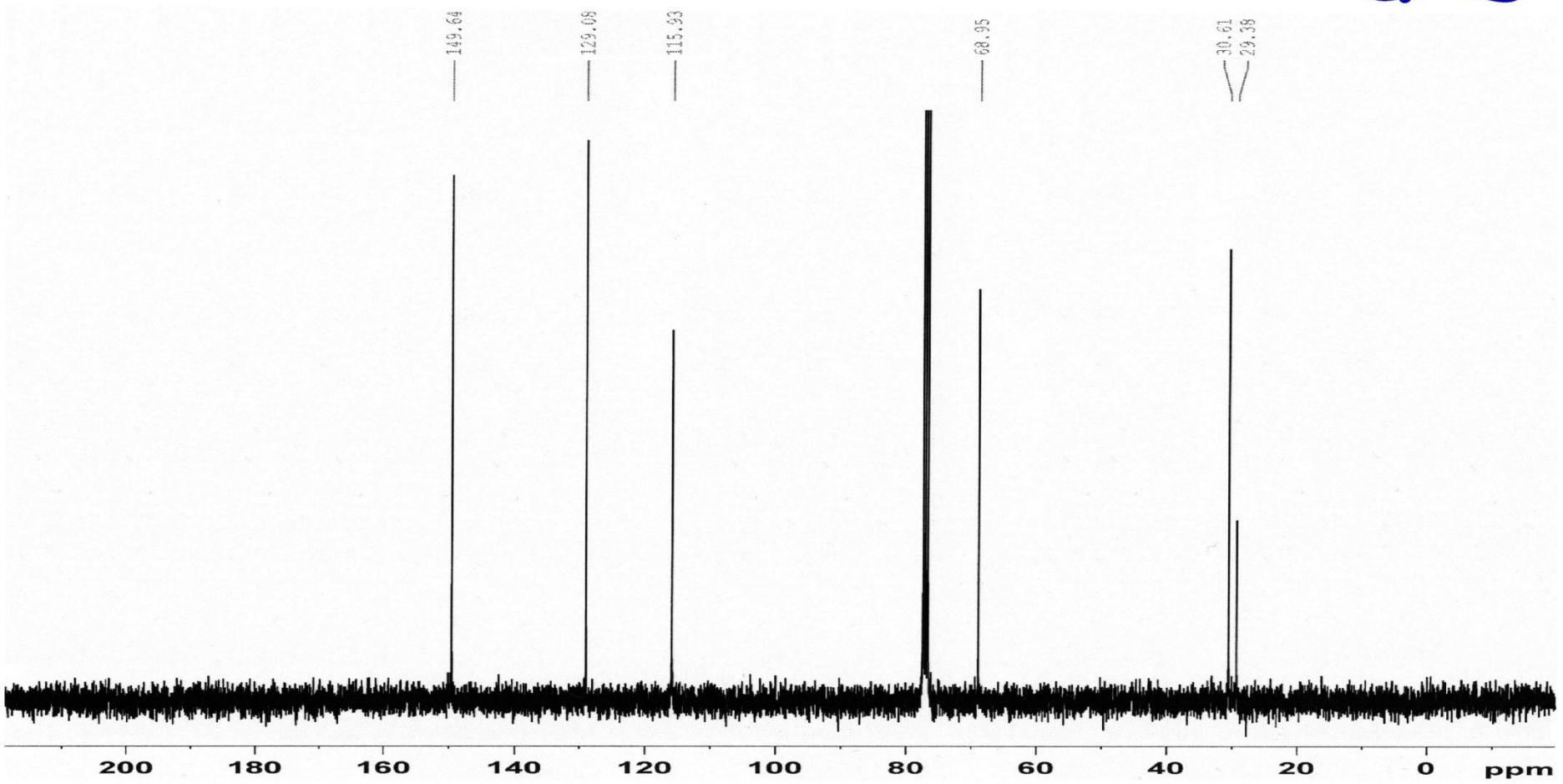


Figure A1 - 23(b): ^{13}C NMR spectra of **23** conducted in $CDCl_3$.

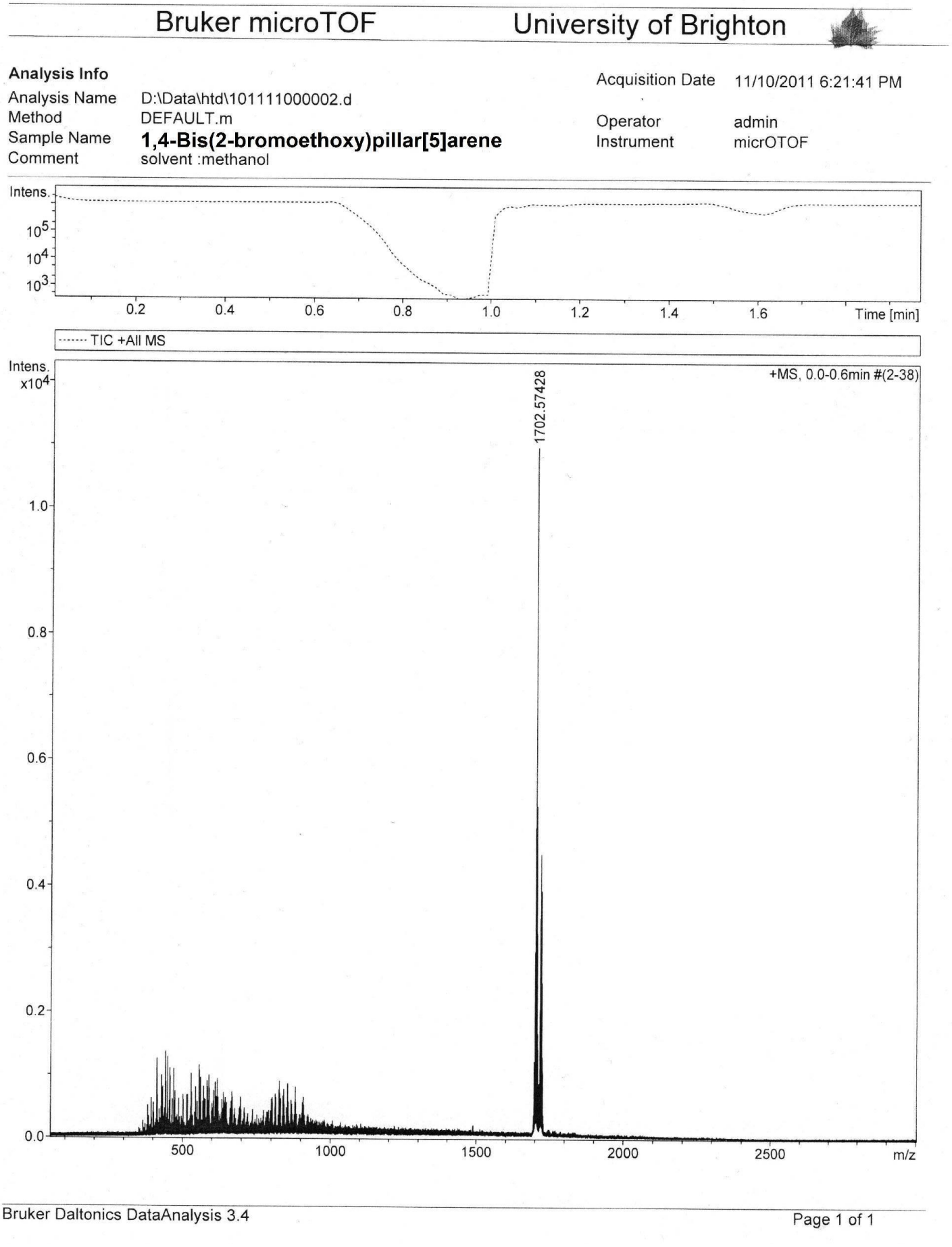


Figure A1 - 23(c): Mass spectra of **23** conducted in methanol.

1,4-Bis(2-ethoxytrimethylammonium)benzene bromide

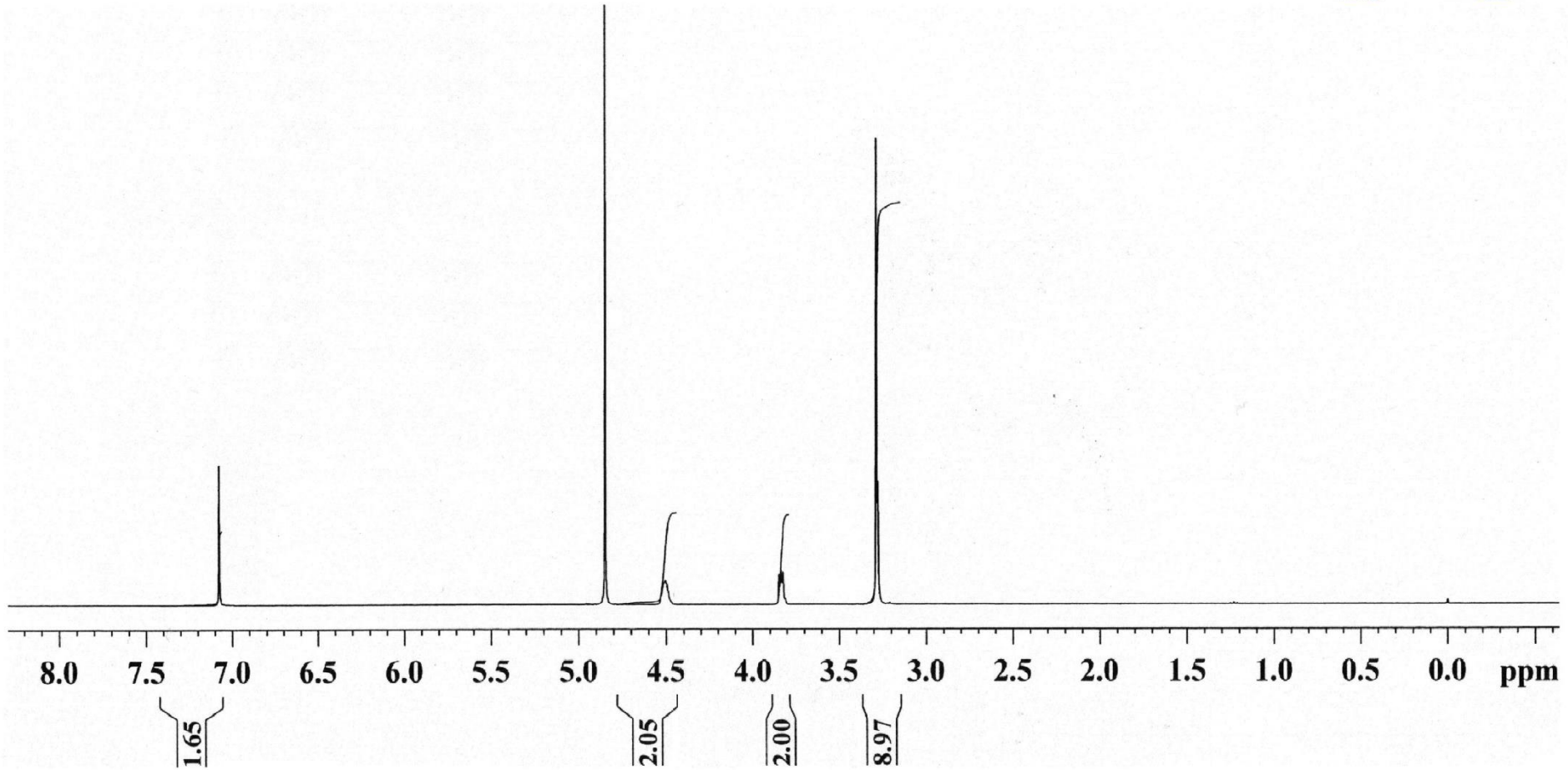


Figure A1 - 24(a): ^{1}H NMR spectra of **24** conducted in D_2O.

1,4-Bis(2-ethoxytrimethylammonium)benzene bromide

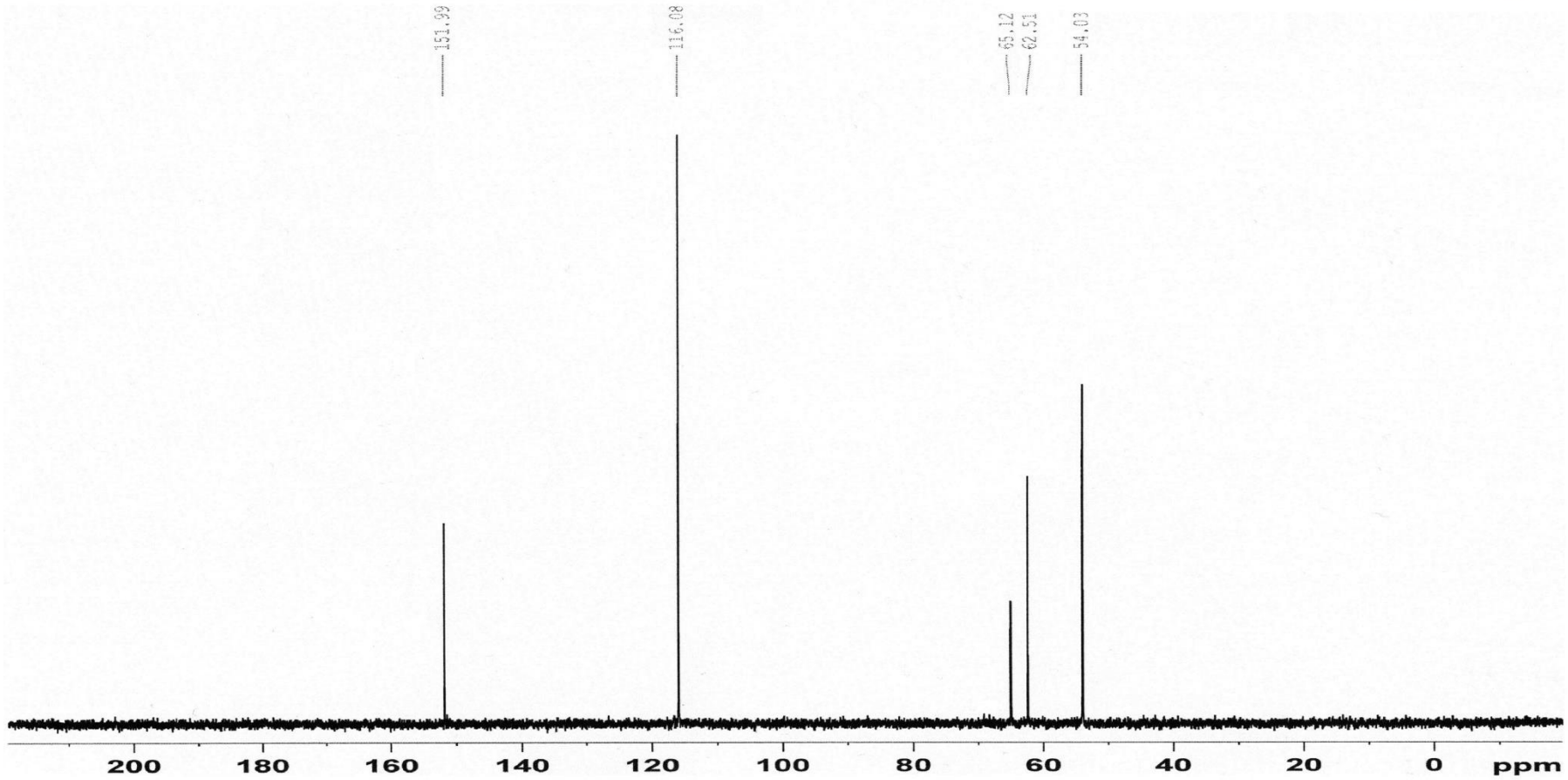


Figure A1 - 24(b): ^{13}C NMR spectra of **24** conducted in D_2O.

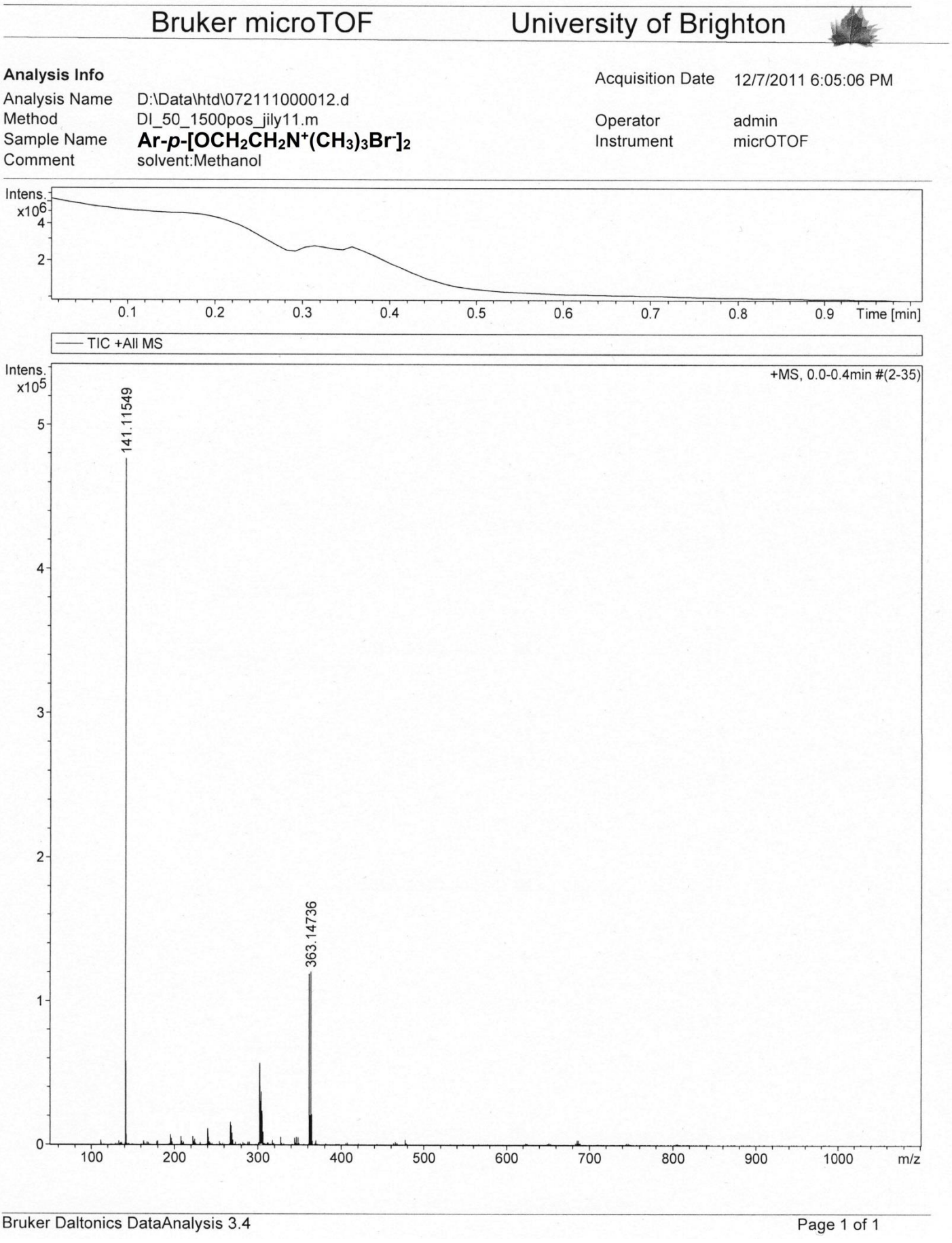


Figure A1 - 24(c): Mass spectra of **24** conducted in methanol.

1,4-Bis(2-ethoxytrimethylammonium)pillar[5]arene bromide

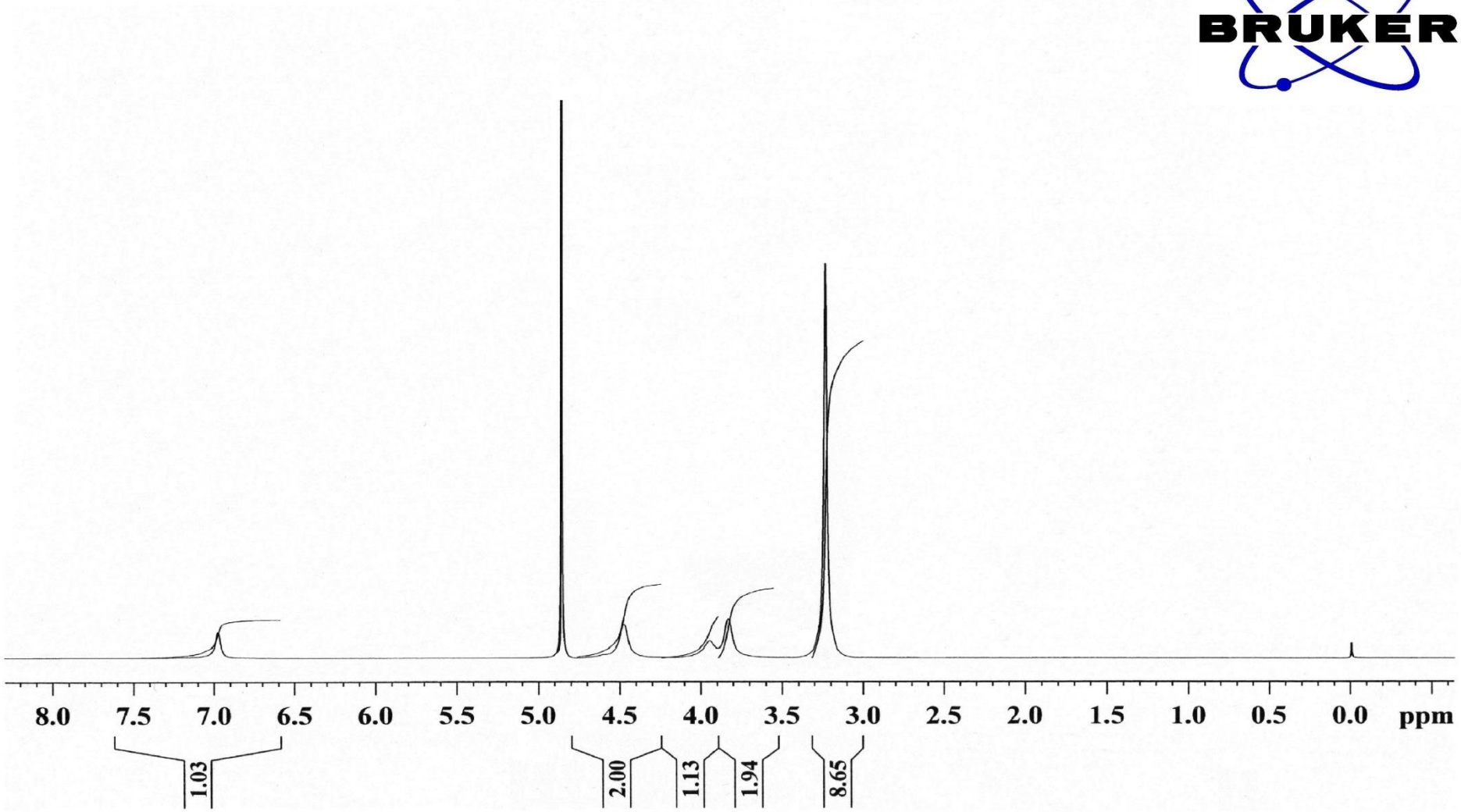


Figure A1 - 25(a): ^{1}H NMR spectra of **25** conducted in D_2O.

1,4-Bis(2-ethoxytrimethylammonium)pillar[5]arene bromide

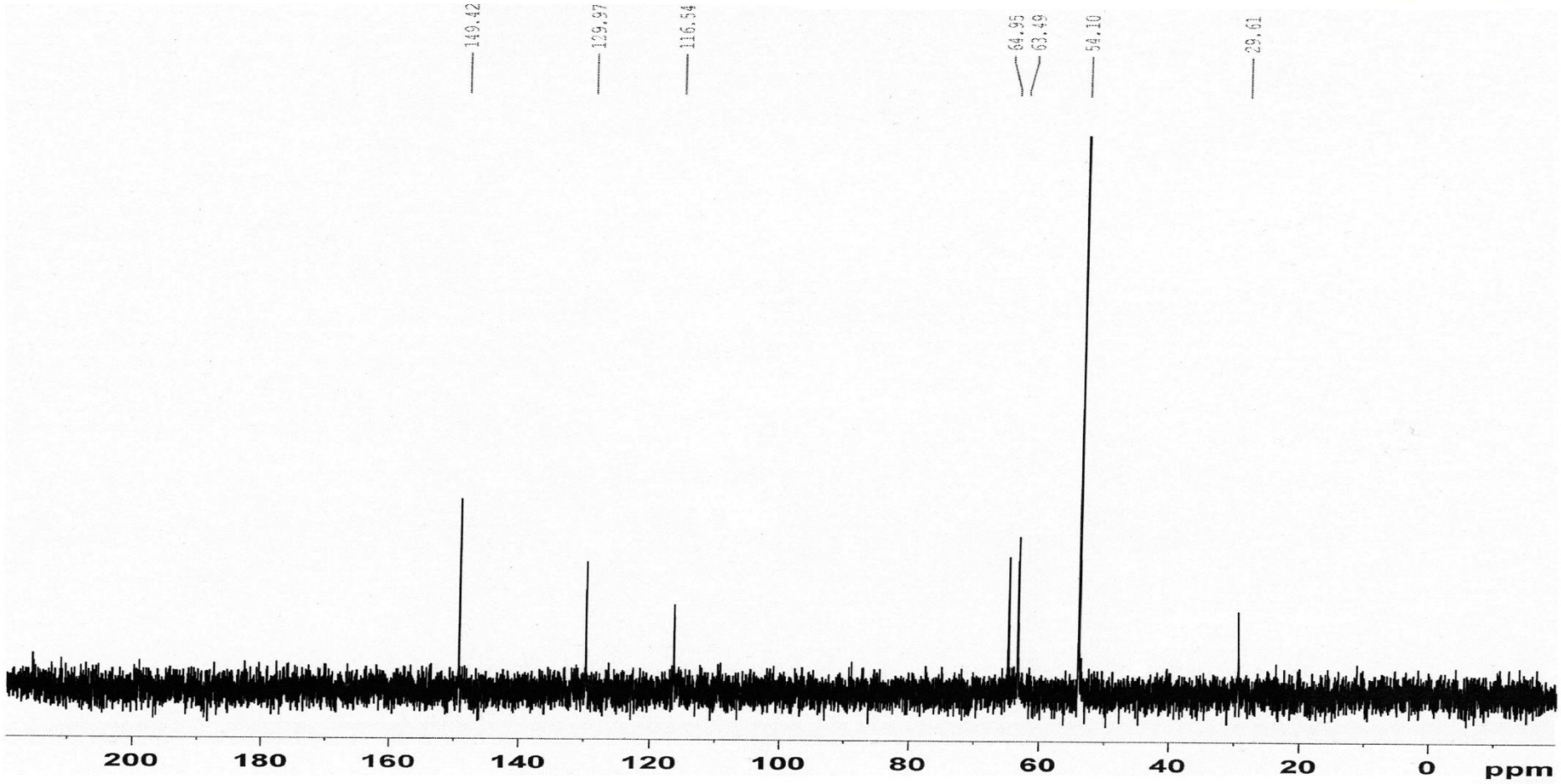


Figure A1 - 25(b): ^{13}C NMR spectra of **25** conducted in D_2O.

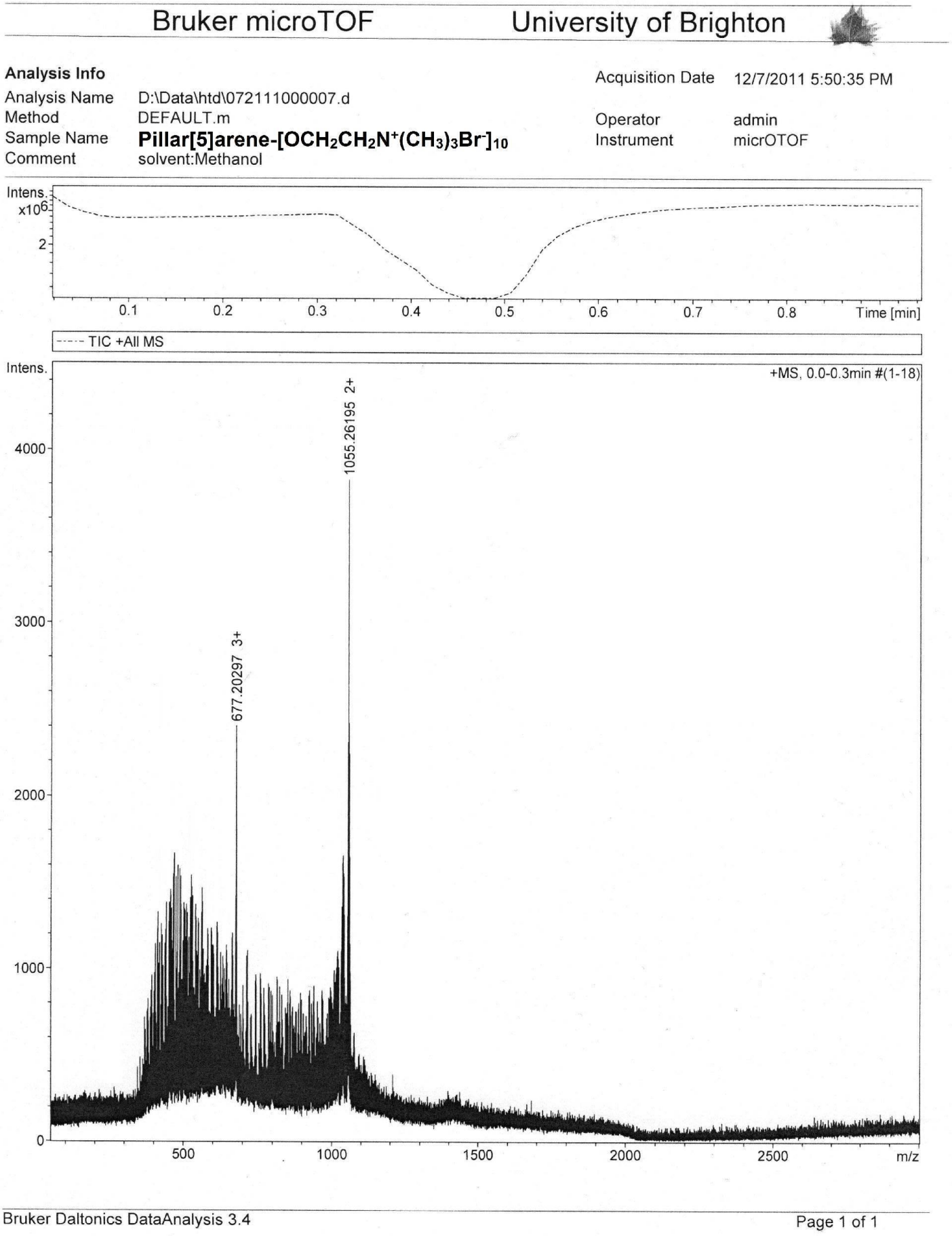


Figure A1 - 25(c): Mass spectra of **25** conducted in methanol.

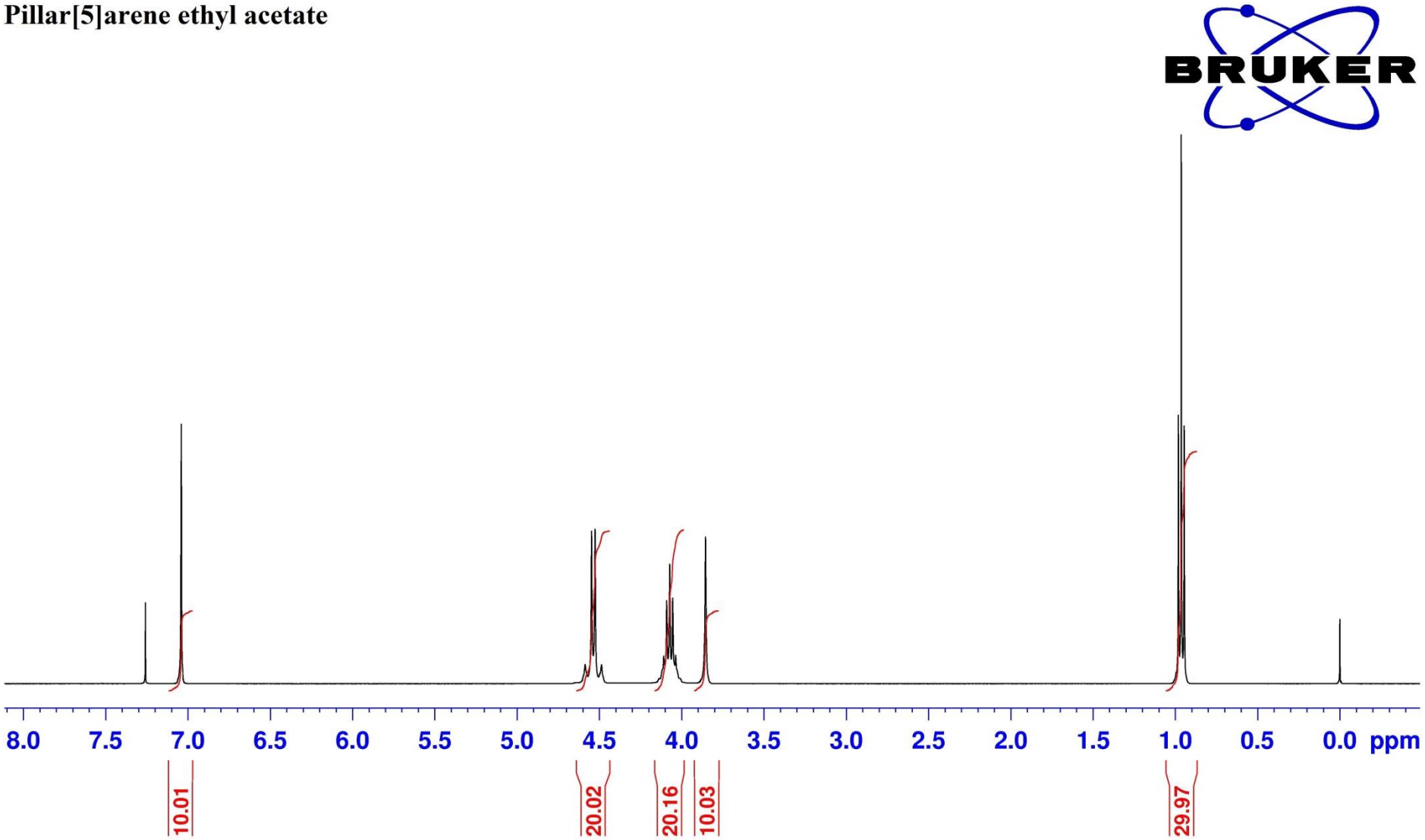


Figure A1 - 26(a): ^{1}H NMR spectra of **26** conducted in $CDCl_3$.

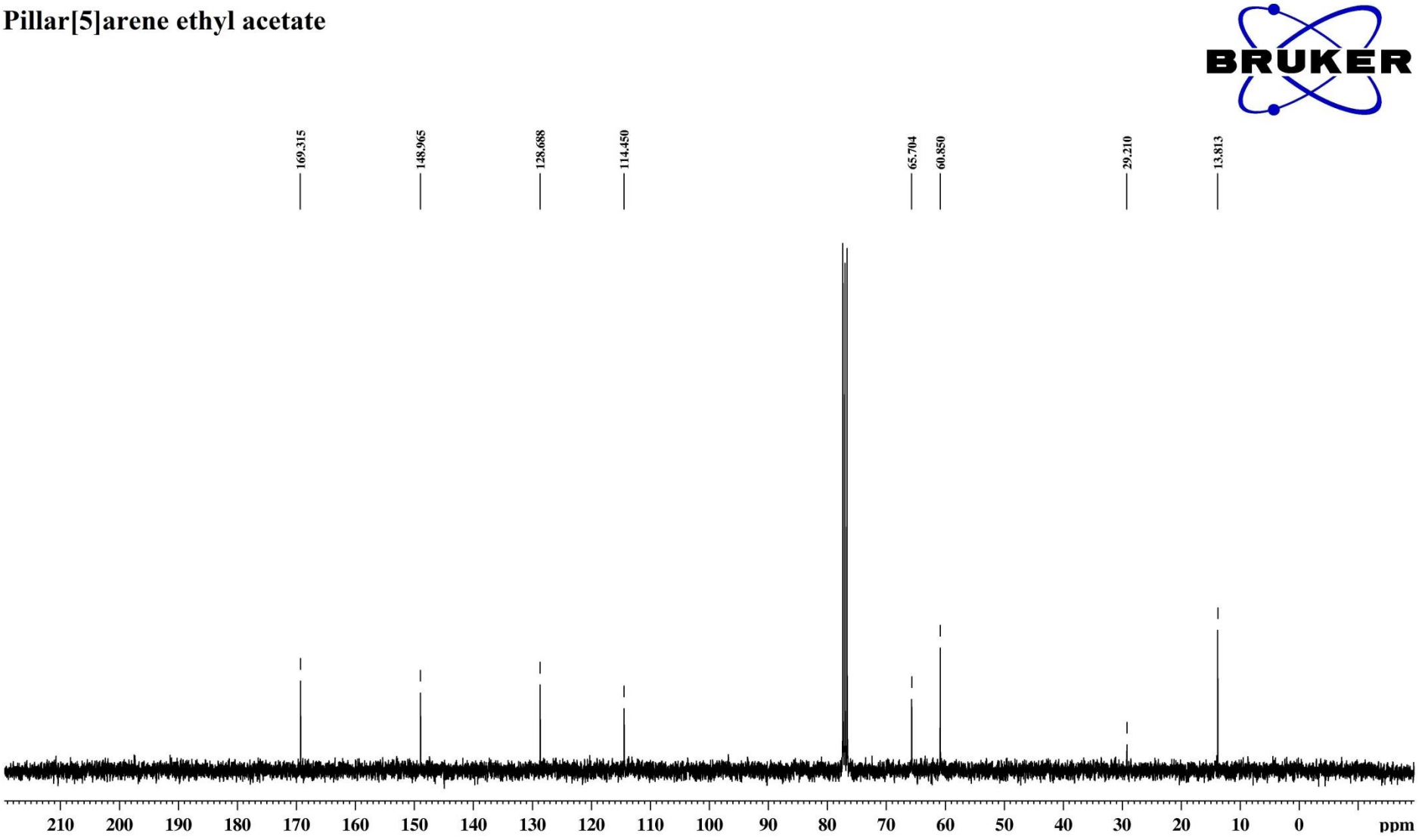


Figure A1 - 26(b): ^{13}C NMR spectra of **26** conducted in $CDCl_3$.

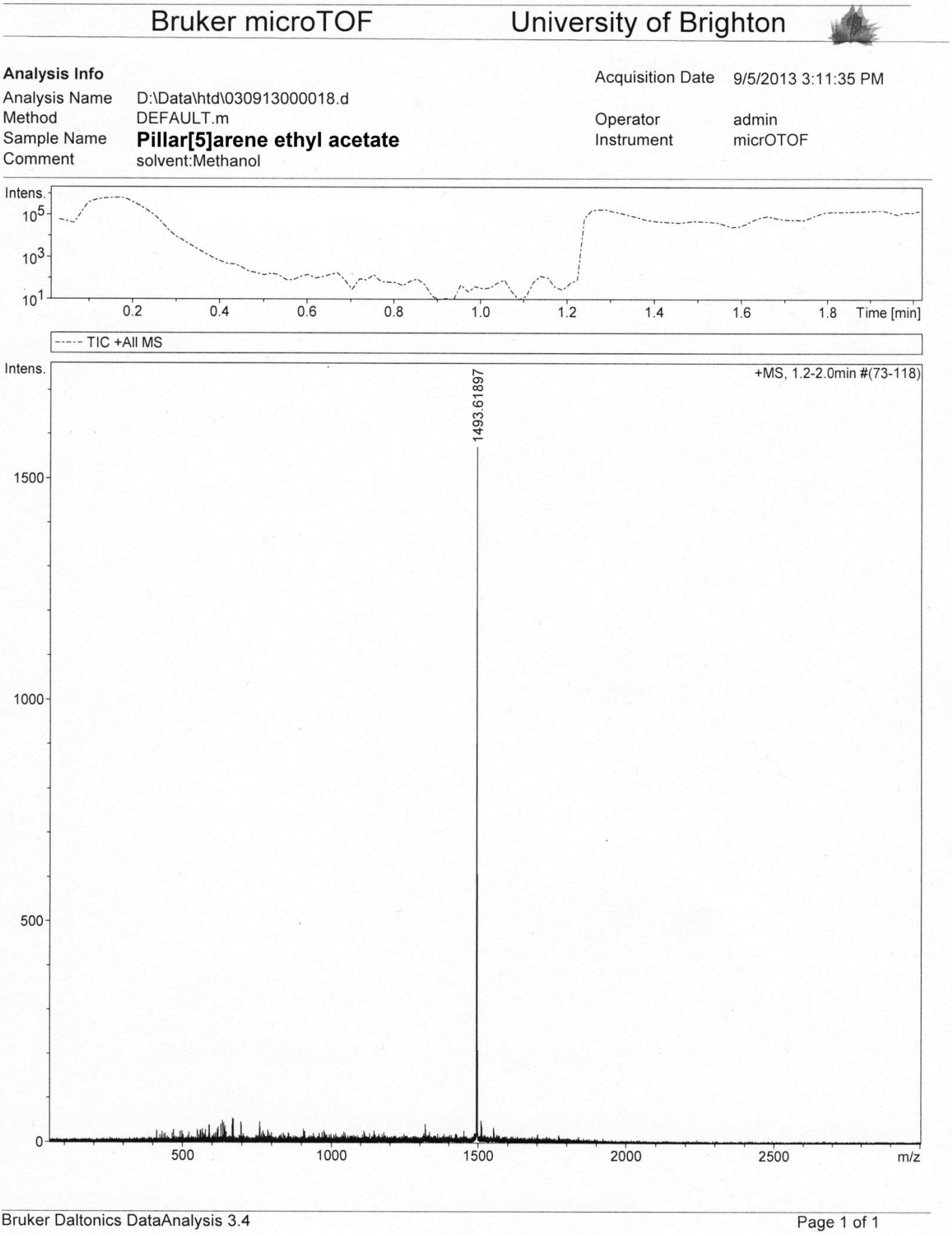


Figure A1 - 26(c): Mass spectra of **26** conducted in methanol.

***cone*-4-t-Butyloxacalix[3]arene tris(N,N-diethylacetamide)**

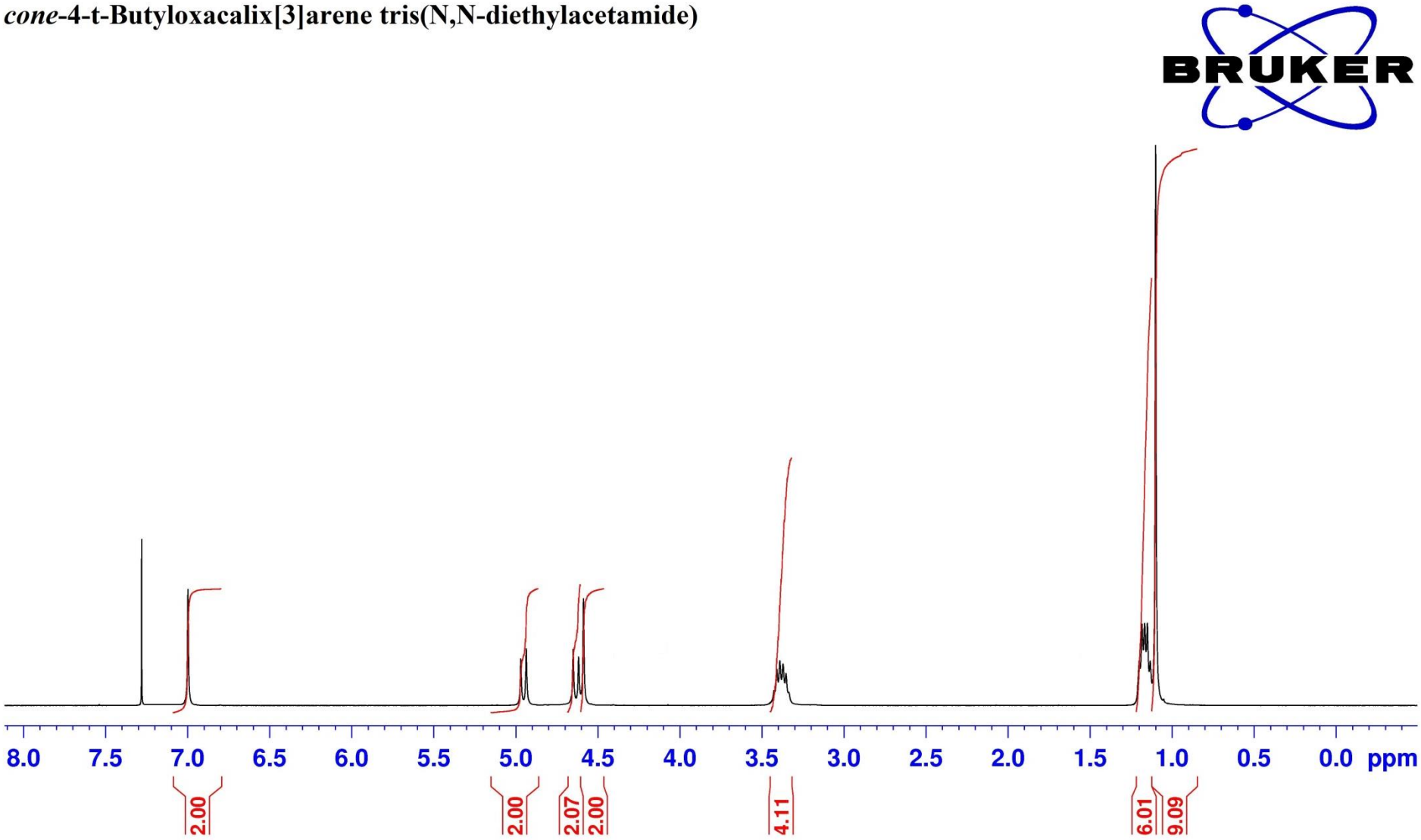


Figure A1 - 27(a): ^{1}H NMR spectra of **27** conducted in $CDCl_3$.

***cone*-4-t-Butyloxacalix[3]arene tris(N,N-diethylacetamide)**

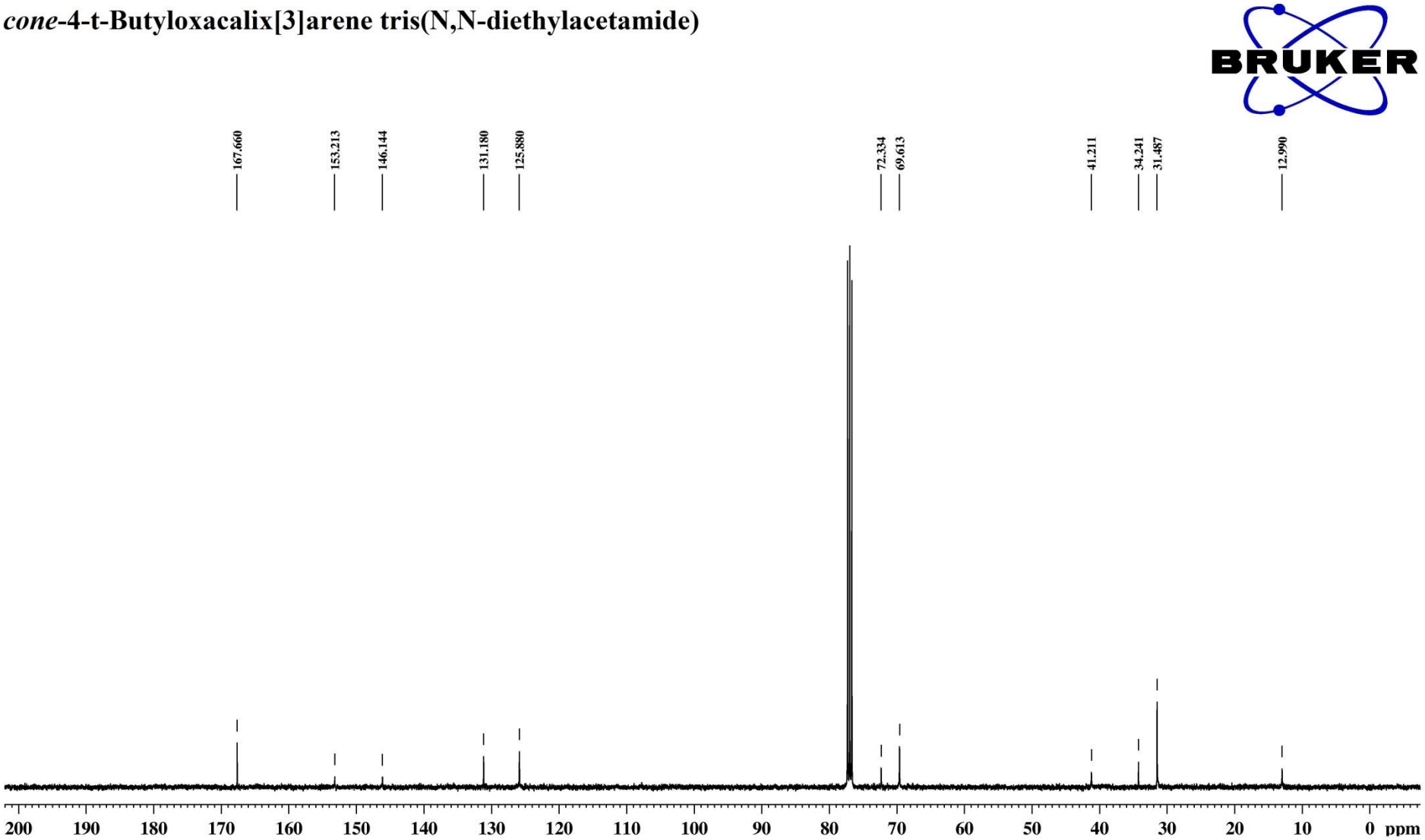


Figure A1 - 27(b): ^{13}C NMR spectra of **27** conducted in $CDCl_3$.

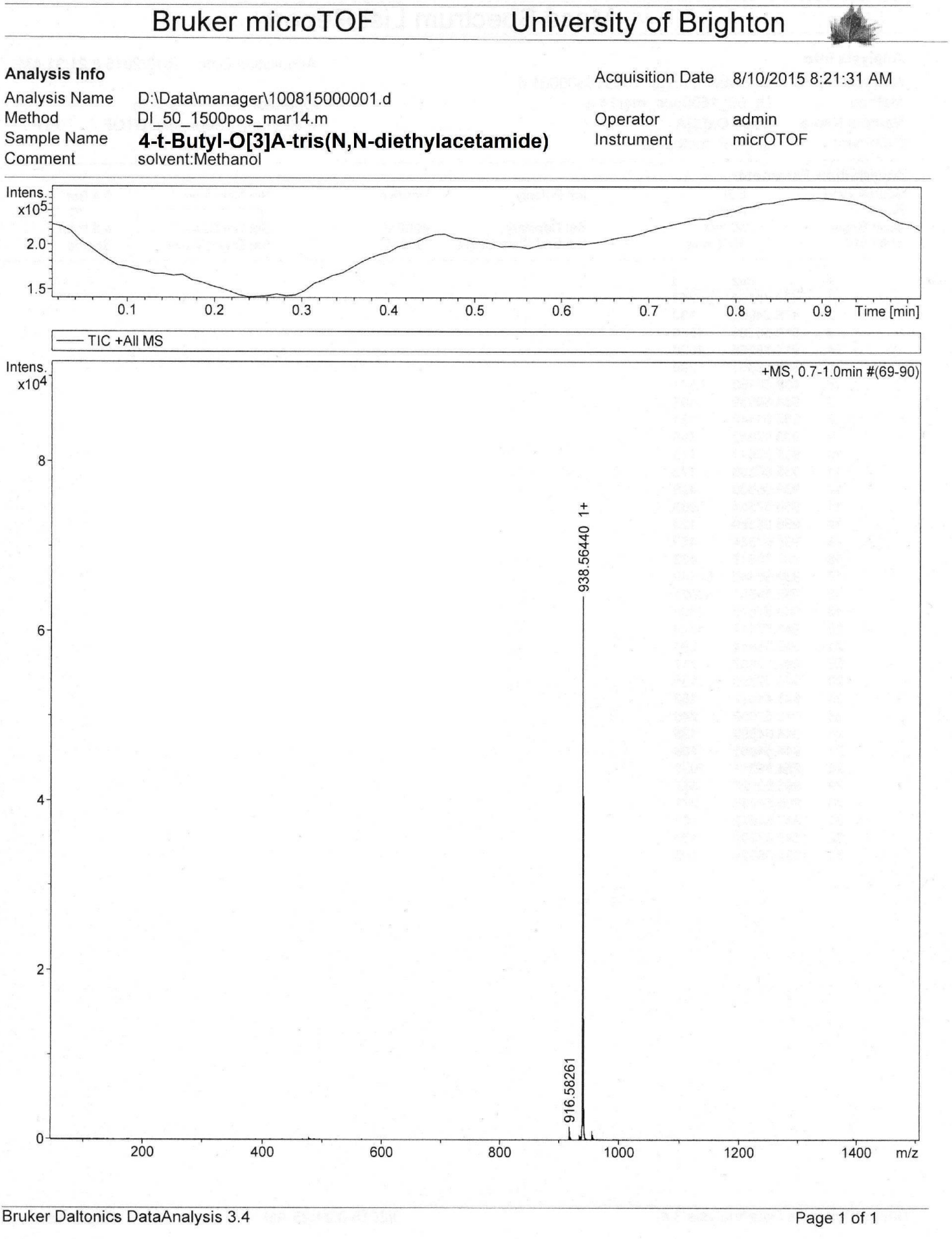


Figure A1 - 27(c): Mass spectra of **27** conducted in methanol.

***cone-p-tert*-butylhexahomotrioxacalix[3]arenetris(acetic acid)**

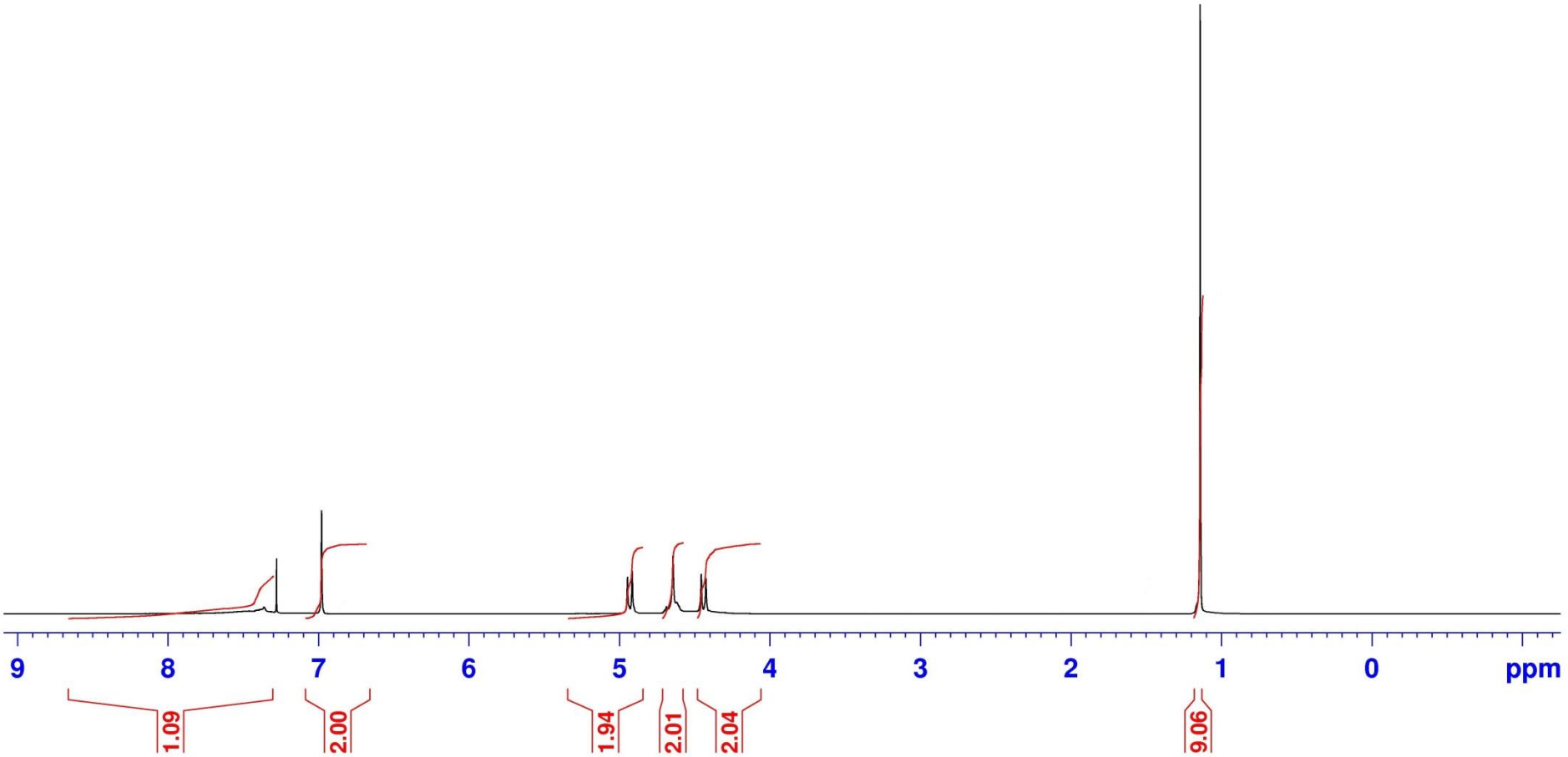


Figure A1 - 28(a): ^{1}H NMR spectra of **28** conducted in $CDCl_3$.

***cone-p-tert*-butylhexahomotrioxacalix[3]arenetris(acetic acid)**

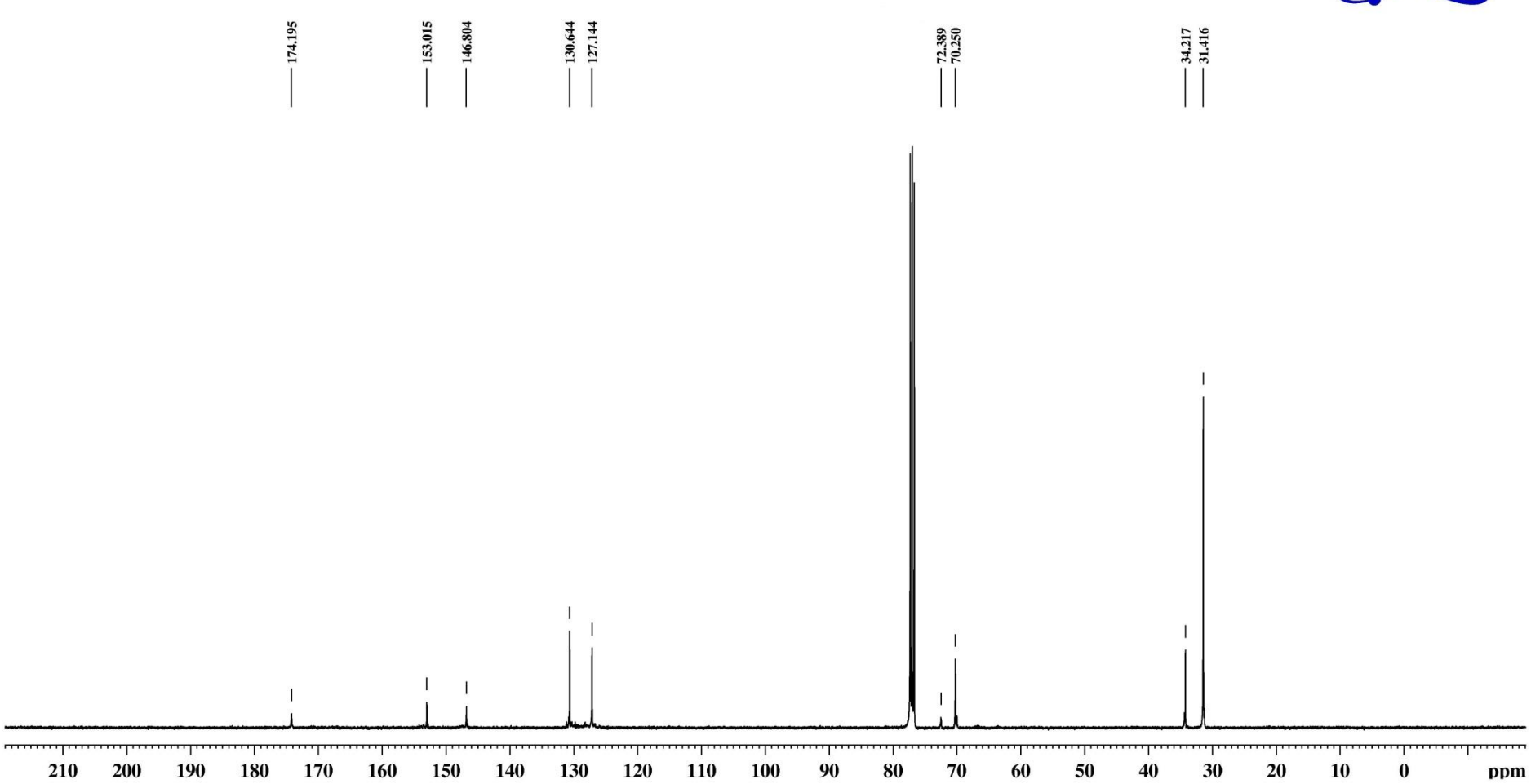


Figure A1 - 28(b): ^{13}C NMR spectra of **28** conducted in $CDCl_3$.

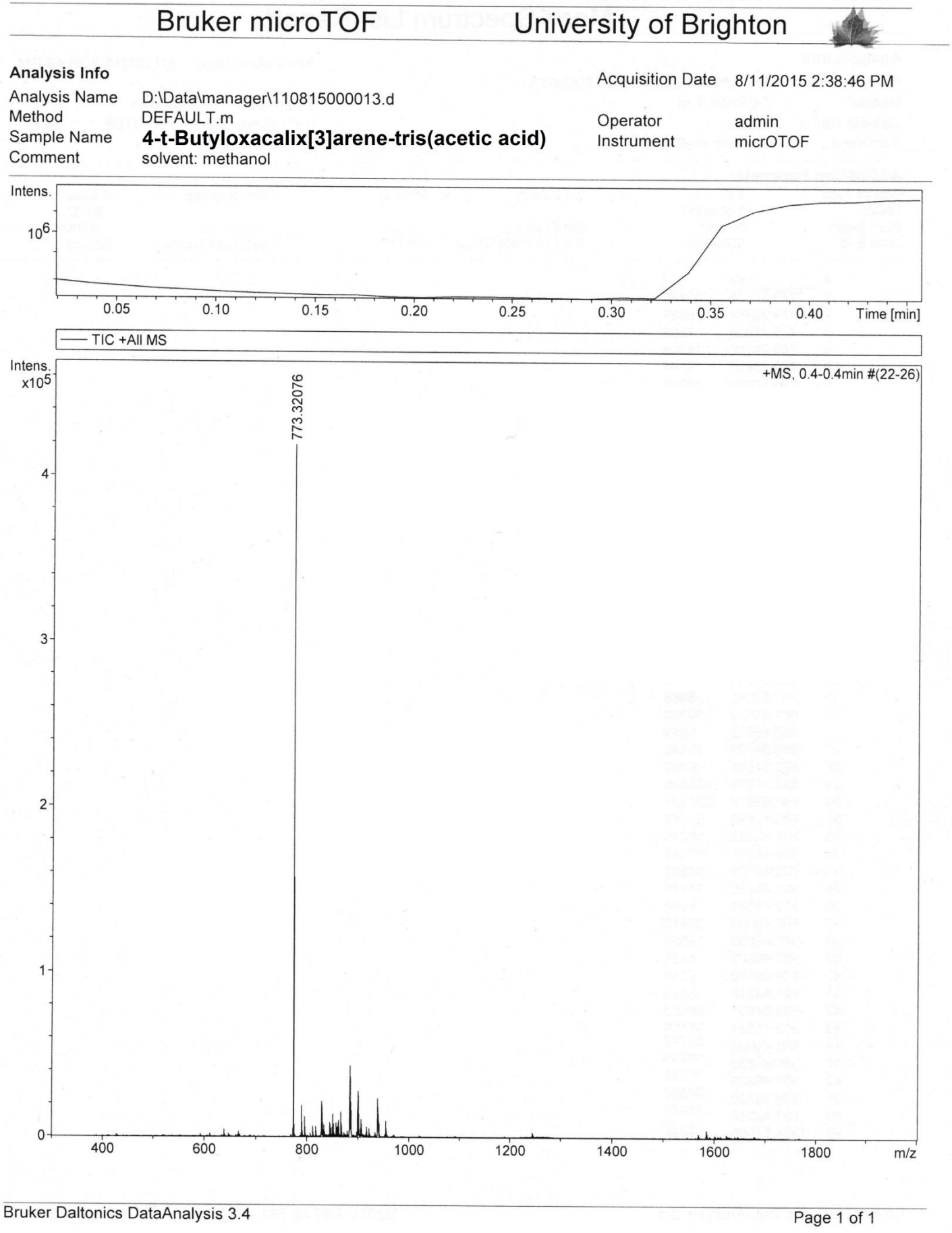


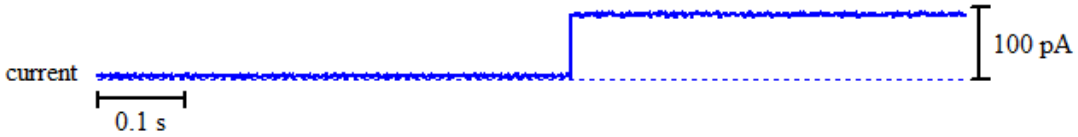
Figure A1 - 28(c): Mass spectra of **28** conducted in methanol.

Appendix II

Planar lipid bilayer experiments

Planar phospholipid bilayer activity of 8 towards Na^+ across the POPE and POPS bilayer system

Recording 1: 100.90 – 102.40 s



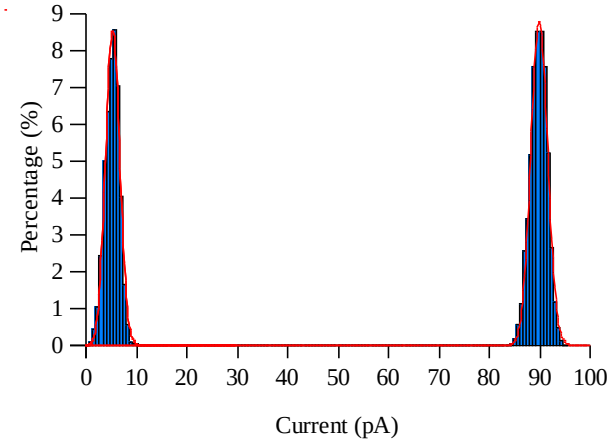


Figure A2 - 1: Above: bilayer activity of **8** with Na^+ ions upon the addition of 50µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 5.2850 ± 0.0201 pA and peak 2 = 89.9100 ± 0.0207 pA.

Recording 1: 203.65 – 237.15 s

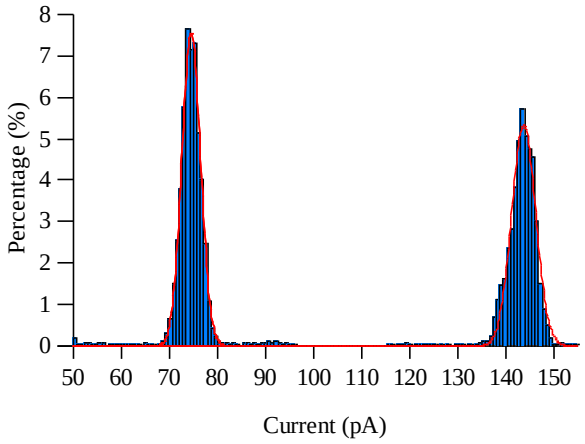
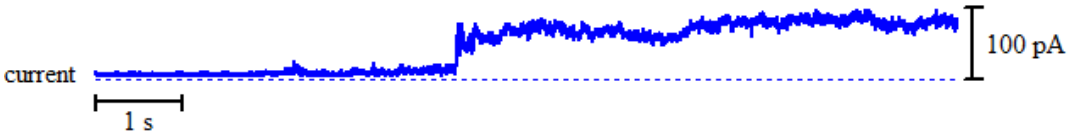


Figure A2 - 2: Above: bilayer activity of **8** with Na^+ ions upon the addition of 100µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 74.5000 ± 0.0319 pA and peak 2 = 143.7000 ± 0.0488 pA.

Recording 2: 305.00 – 320.00 s



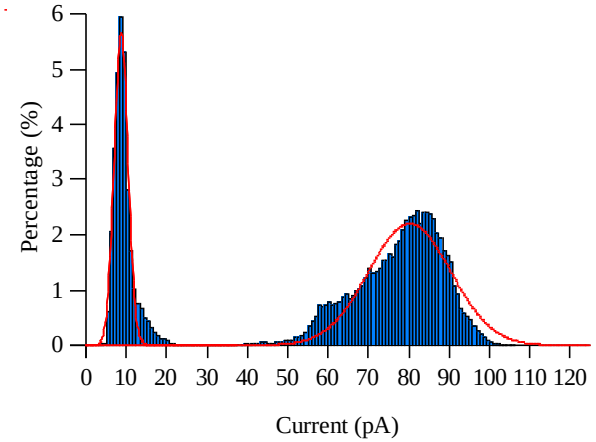
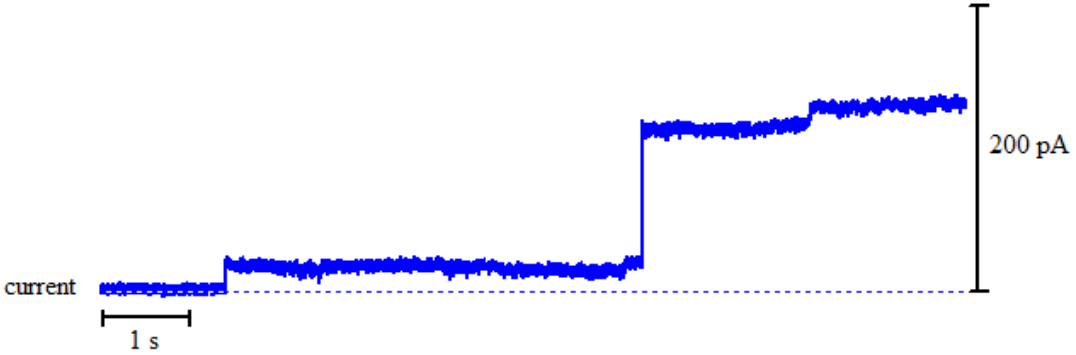


Figure A2 - 3: Above: bilayer activity of **8** with Na^+ ions upon the addition of 150µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 8.7040 ± 0.0589 pA and peak 2 = 80.1100 ± 0.3392 pA.

Recording 3: 202.17 – 213.17 s



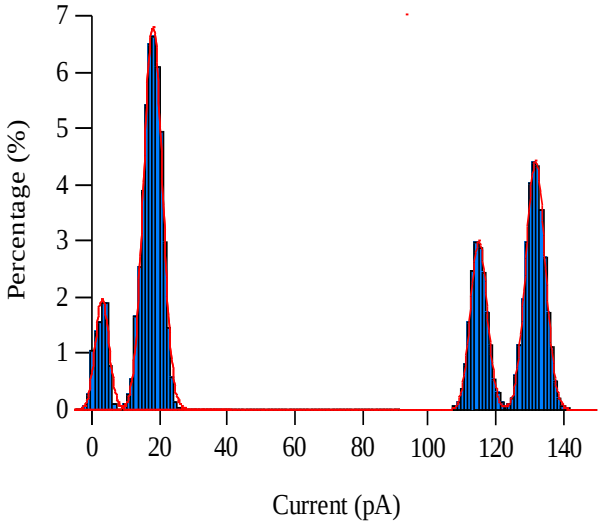
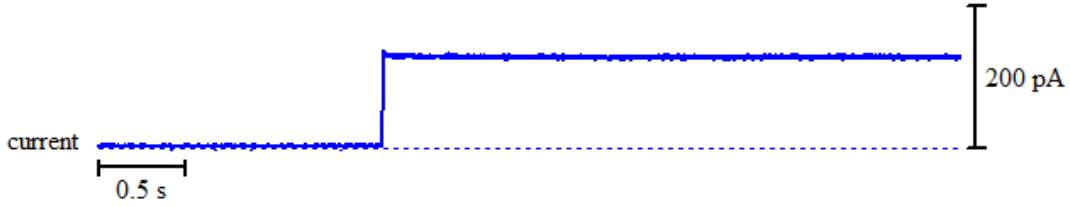


Figure A2 - 4: Above: bilayer activity of **8** with Na^+ ions upon the addition of 100µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 2.9080 ± 0.1642 pA, peak 2 = 17.9500 ± 0.0548 pA, peak 3 = 115 ± 0.0396 pA, and peak 4 = 131.8 ± 0.02815 pA.

Recording 4: 116.00 – 121.00 s



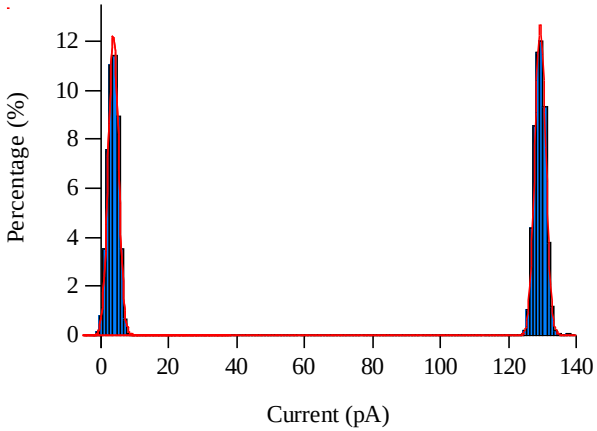
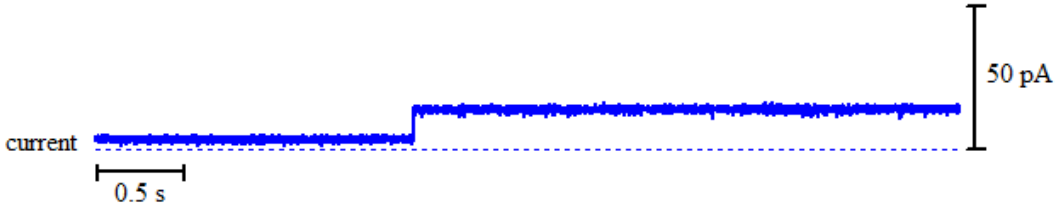


Figure A2 - 5: Above: bilayer activity of **8** with Na^+ ions upon the addition of 50µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 3.787 ± 0.01876 pA and peak 2 = 129.4 ± 0.01811 pA.

Recording 5: 607.00 – 612.00 s



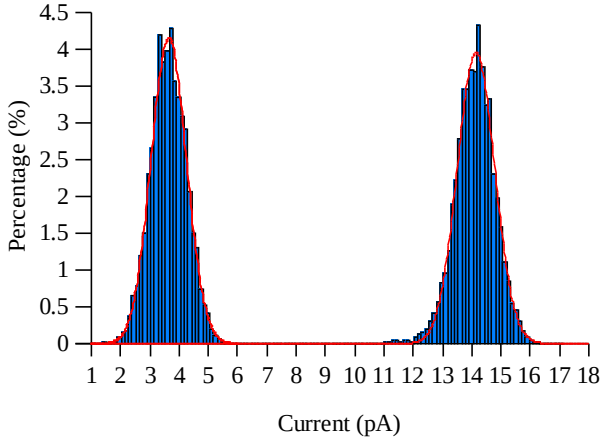
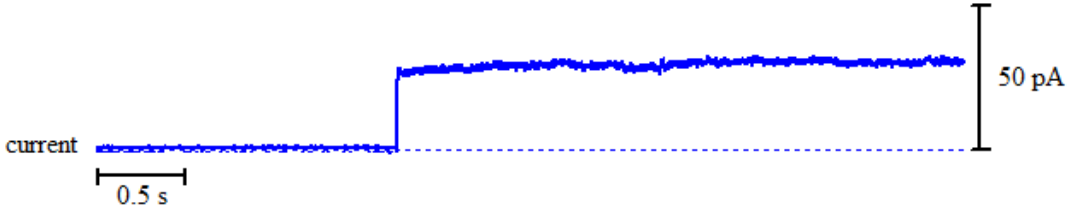


Figure A2 - 6: Above: bilayer activity of **8** with Na^+ ions upon the addition of 200µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 3.642 ± 0.008 pA and peak 2 = 14.14 ± 0.0084 pA.

Recording 6: 714.40 – 726.80 s



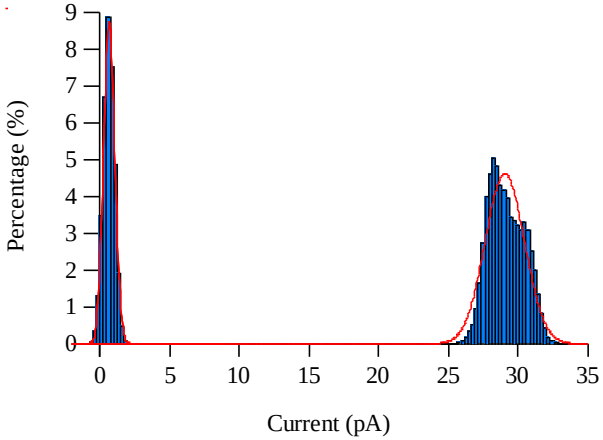
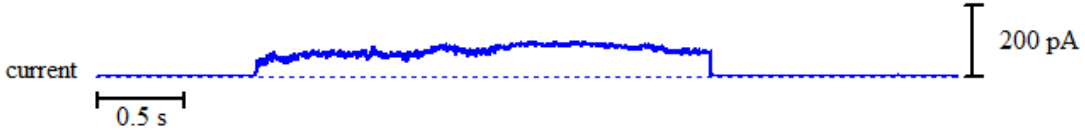


Figure A2 - 7: Above: bilayer activity of **8** with Na^+ ions upon the addition of 175µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.6366 ± 0.0122 pA and peak 2 = 29.01 ± 0.0397 pA.

Recording 7: 131.50 – 136.50 s



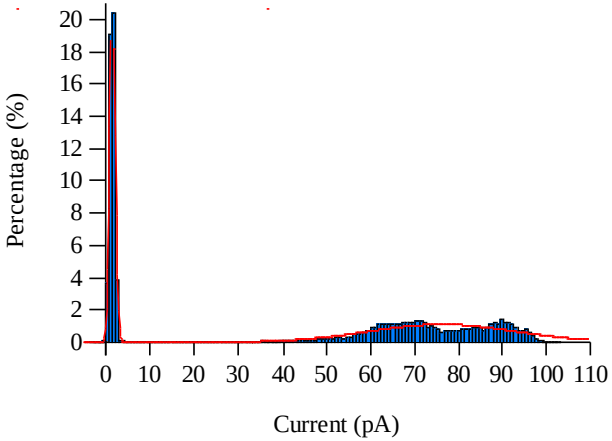
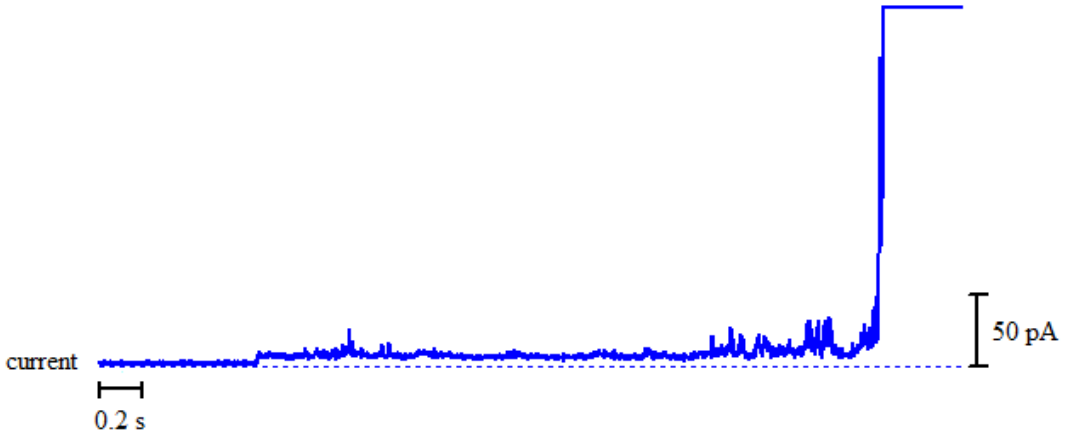


Figure A2 - 8: Above: bilayer activity of **8** with Na^+ ions upon the addition of 25µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.427 ± 0.0047 pA and peak 2 = 76.14 ± 0.8700 pA.

Recording 8: 537.00 – 542.00 s



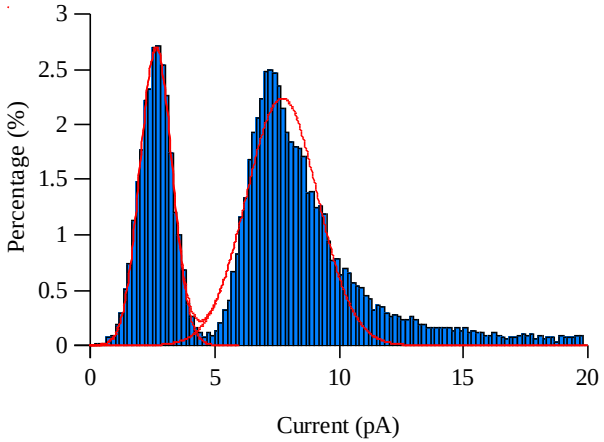
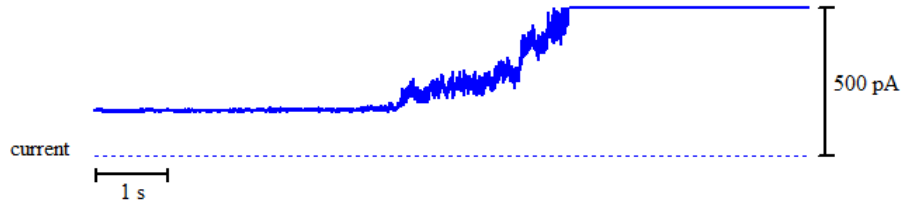


Figure A2 - 9: Above: bilayer activity of **8** with Na^+ ions upon the addition of 225µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 2.632 ± 0.0247 pA and peak 2 = 7.657 ± 0.0436 pA.

Recording 9: 235.90 – 245.40 s



Recording 10: 583.00 - 592.00 s

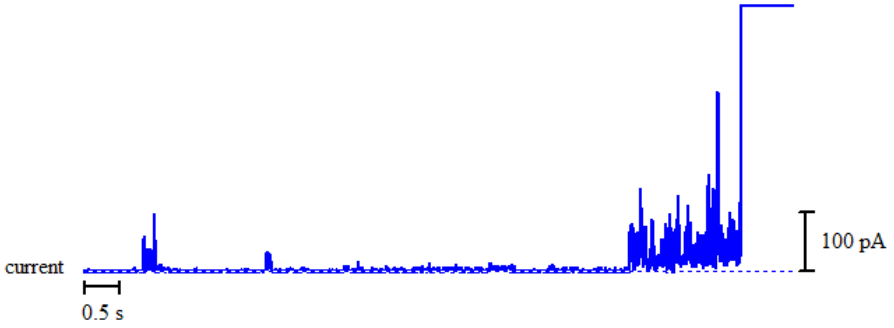
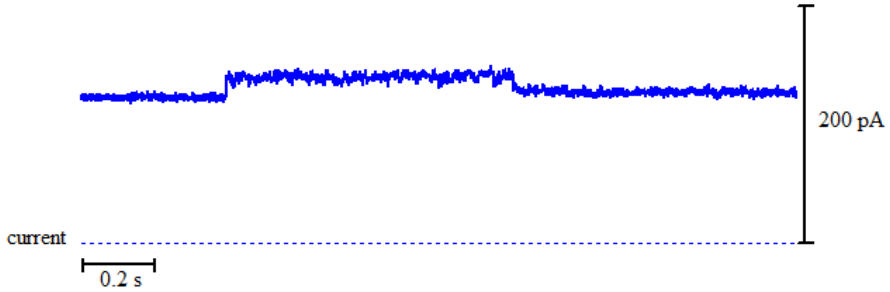
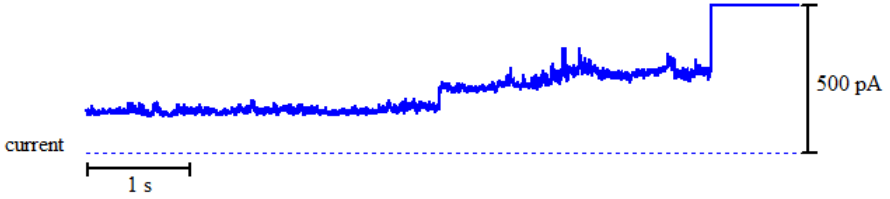


Figure A2 - 10: Bilayer activity of **8** with Na^+ ions upon the addition of 100µl (recording 9), 125µl (recording 10) stock solution of **8** in DMSO.

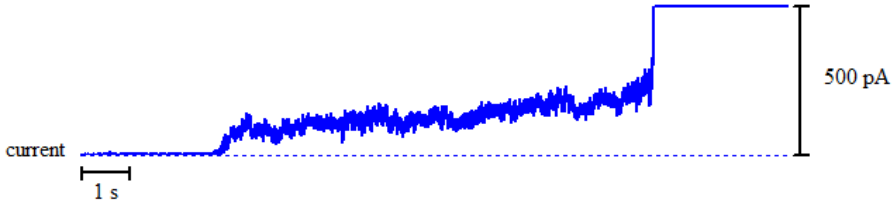
Recording 11: 547.00 - 578.00 s



Recording 11: 588.55 – 593.55 s



Recording 12: 782.00 - 812.00 s



Recording 13: 1126.70 – 1136.70 s

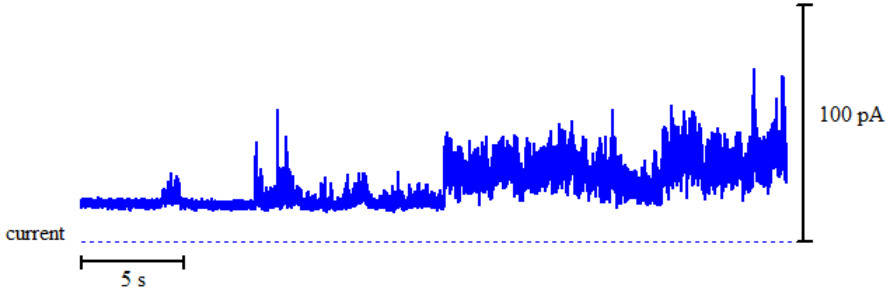
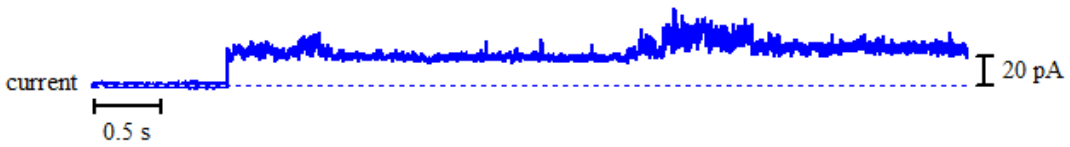


Figure A2 - 11: Bilayer activity of **8** with Na^+ ions upon the addition of 150µl (recordings 11), 225µl (recording 12) and 250µl (recording 13) stock solution of **8** in DMSO.

Planar phospholipid bilayer activity of 8 towards K^+ across the POPE and POPS bilayer system

Recording 1: 718.00 – 724.50 s



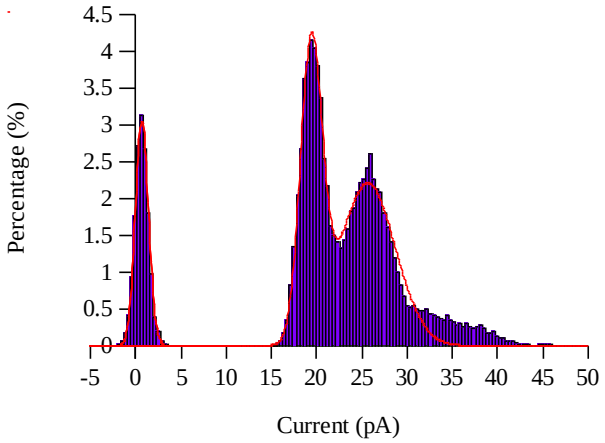


Figure A2 - 12: Above: bilayer activity of **8** with K^+ ions upon the addition of 175µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.686 ± 0.0274 pA, peak 2 = 19.4 ± 0.0317 pA and peak 3 = 25.6 ± 0.1118 pA.

Planar phospholipid bilayer activity of 8 towards Li^+ across the POPE and POPS bilayer system

Recording 1: 633.00 – 636.00 s

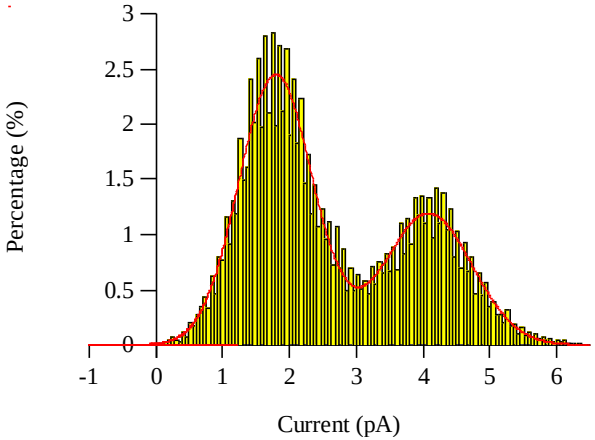


Figure A2 - 13: Above: bilayer activity of **8** with Li^+ ions upon the addition of 150µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.787 ± 0.0139 pA and peak 2 = 4.071 ± 0.0309 pA.

Recording 2: 620.00 – 680.00 s

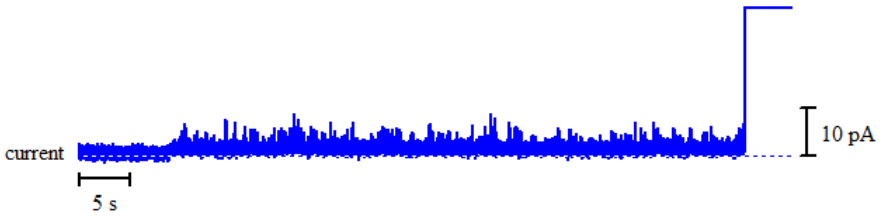


Figure A2 - 14: Bilayer activity of **8** with K^+ ions upon the addition of 150µl (recording 2) stock solution of **8** in DMSO

Planar phospholipid bilayer activity of 8 towards Rb^+ across the POPE and POPS bilayer system

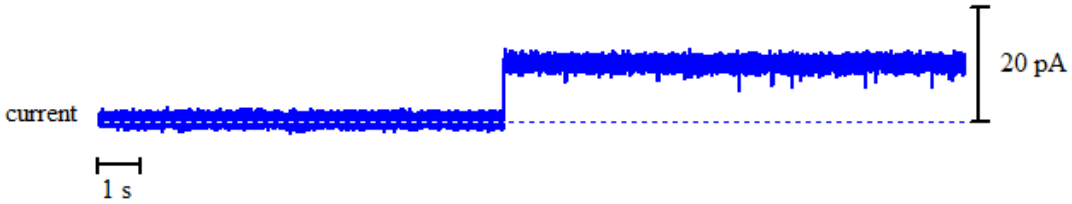
Due to experimental limitations, the ion channel activity of **8** towards Rb^+ was unable to be investigated across this bilayer system.

Planar phospholipid bilayer activity of 8 towards Cs^+ across the POPE and POPS bilayer system

No activity was produced with **8** towards Cs^+ across this bilayer system

Planar phospholipid bilayer activity of 8 towards Na^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 570.00 – 580.00 s



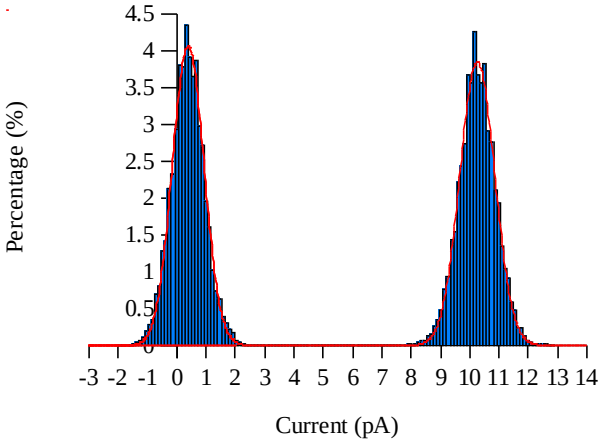
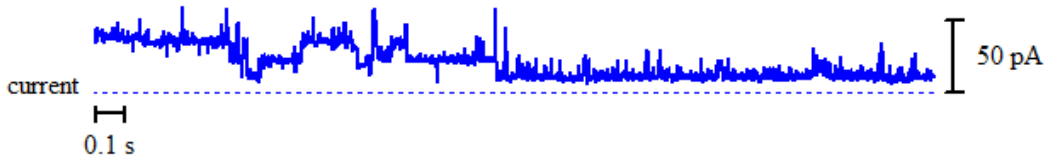


Figure A2 - 15: Above: bilayer activity of **8** with Na^+ ions upon the addition of 125µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.3814 ± 0.0069 pA and peak 2 = 10.25 ± 0.0077 pA.

Recording 1: 712.56 – 715.56 s



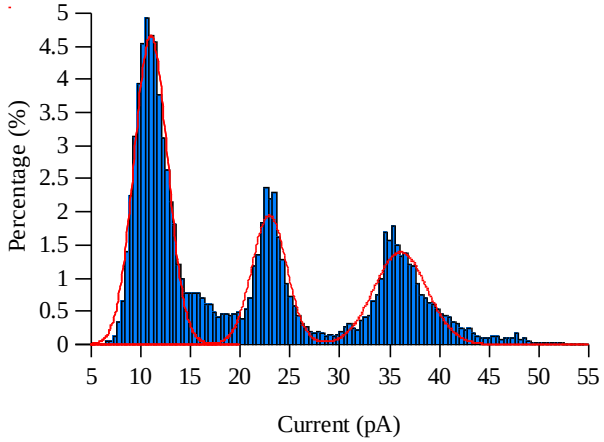


Figure A2 - 16: Above: bilayer activity of **8** with Na^+ ions upon the addition of 150µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 10.98 ± 0.0510 pA, peak 2 = 22.88 ± 0.1265 pA and peak 3 = 36.05 ± 0.2159 pA.

Recording 1: 726.20 – 727.80 s

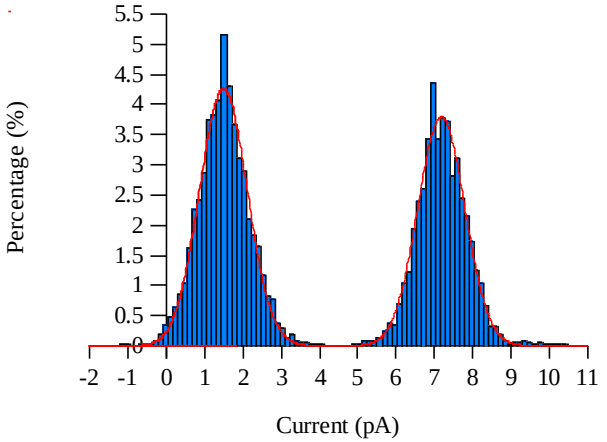
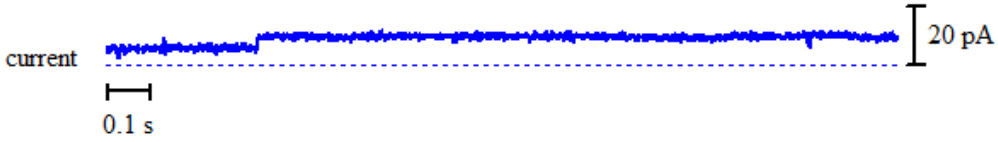


Figure A2 - 17: Above: bilayer activity of **8** with Na^+ ions upon the addition of 150µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.489 ± 0.0120 pA and peak 2 = 7.173 ± 0.0134 pA.

Recording 1: 730.20 – 731.70 s



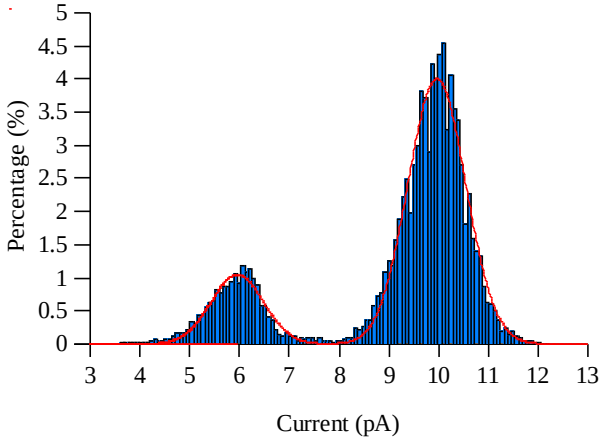
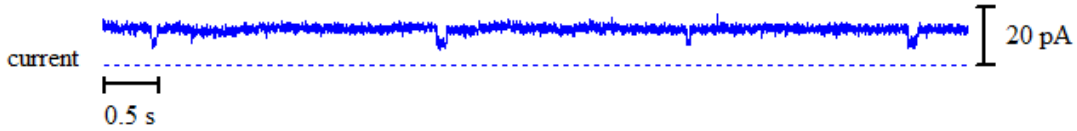


Figure A2 - 18: Above: bilayer activity of **8** with Na^+ ions upon the addition of 150µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 5.947 ± 0.0396 pA and peak 2 = 9.963 ± 0.0108 pA.

Recording 1: 739.70 –746.70 s



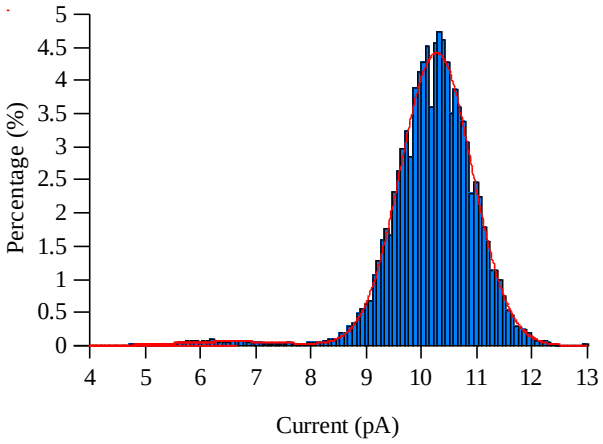
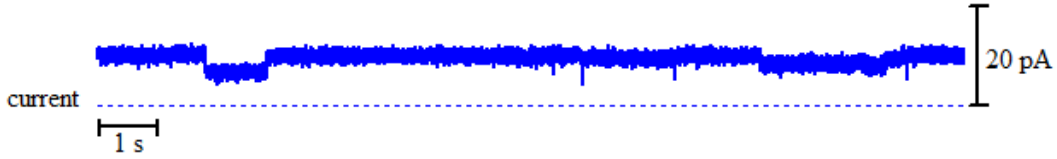


Figure A2 - 19: Above: bilayer activity of **8** with Na^+ ions upon the addition of 150µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 5.947 ± 0.0396 pA and peak 2 = 9.963 ± 0.0108 pA.

Recording 1: 761.00 – 776.00 s



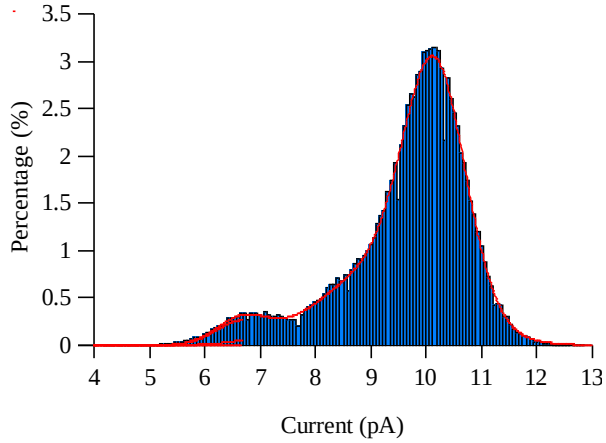
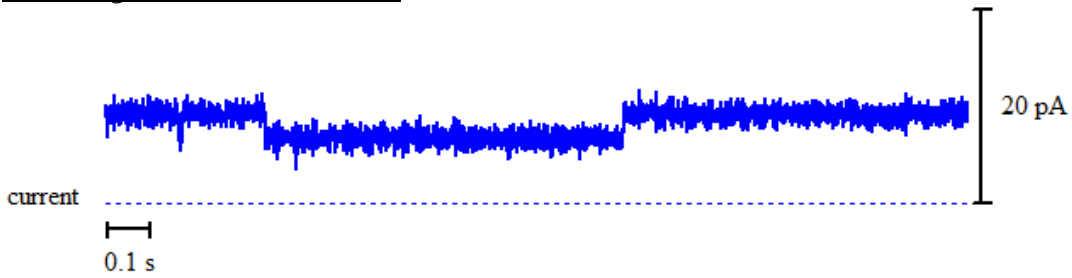


Figure A2 - 20: Above: bilayer activity of **8** with Na^+ ions upon the addition of 150µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 6.67 ± 0.0173 pA and peak 2 = 10.16 ± 0.0101 pA.

Recording 1: 1187.00 – 1192.00 s



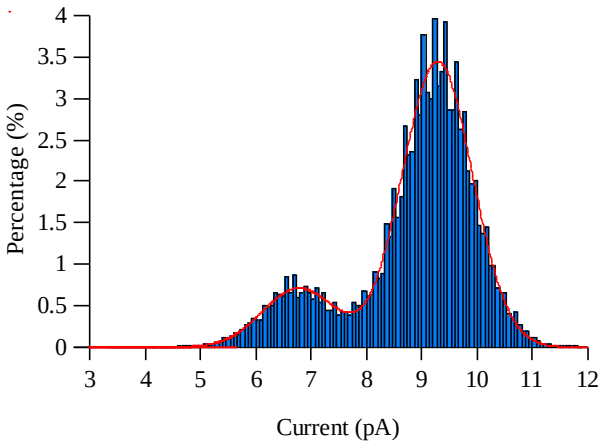
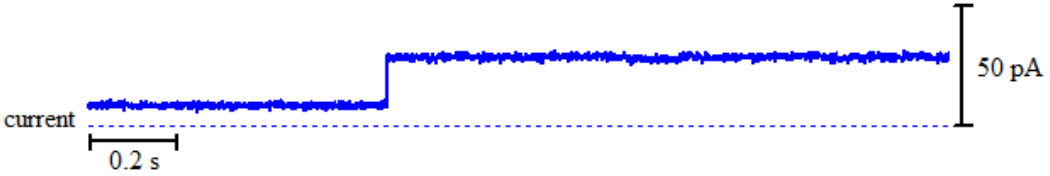


Figure A2 - 21: Above: bilayer activity of **8** with Na^+ ions upon the addition of 225µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 6.772 ± 0.0545 pA and peak 2 = 9.279 ± 0.0112 pA.

Recording 1: 1417.00 – 1428.00 s



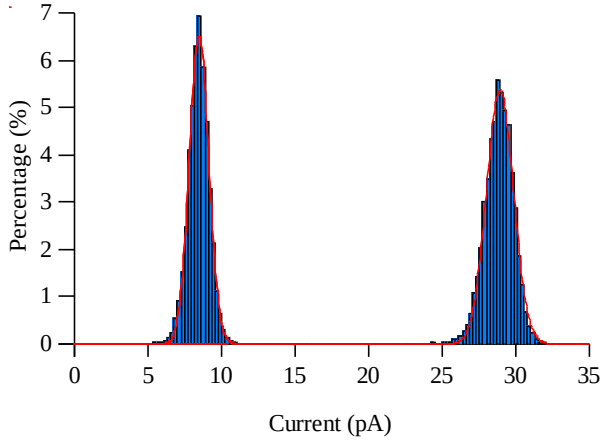


Figure A2 - 22: Above: bilayer activity of **8** with Na^+ ions upon the addition of 250µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 8.463 ± 0.0061 pA and peak 2 = 28.92 ± 0.0085 pA.

Recording 2: 500.00 – 550.00 s

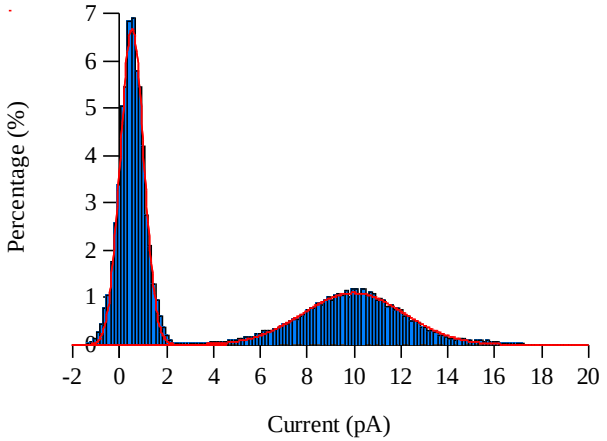


Figure A2 - 23: Above: bilayer activity of **8** with Na^+ ions upon the addition of 125µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.5275 ± 0.0043 pA and peak 2 = 9.956 ± 0.0533 pA.

Recording 2: 870.30 – 894.30 s

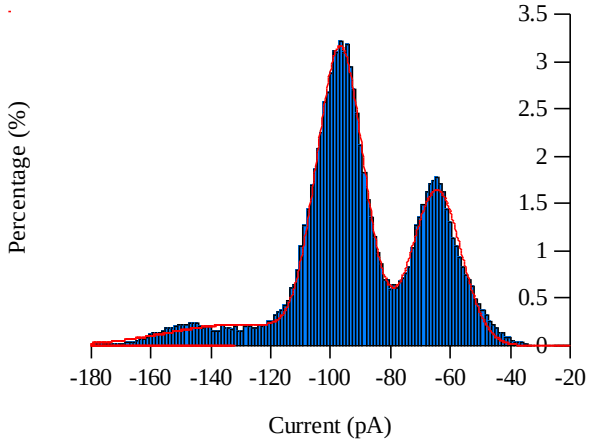
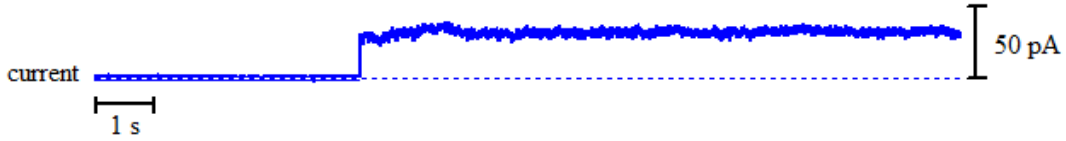


Figure A2 - 24: Above: bilayer activity of **8** with Na^+ ions upon the addition of 150µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = -131.3 ± 0.9404 pA, peak 2 = -96.84 ± 0.0781 pA and peak 3 = -64.66 ± 0.1414 pA.

Recording 3: 254.00 – 264.00 s



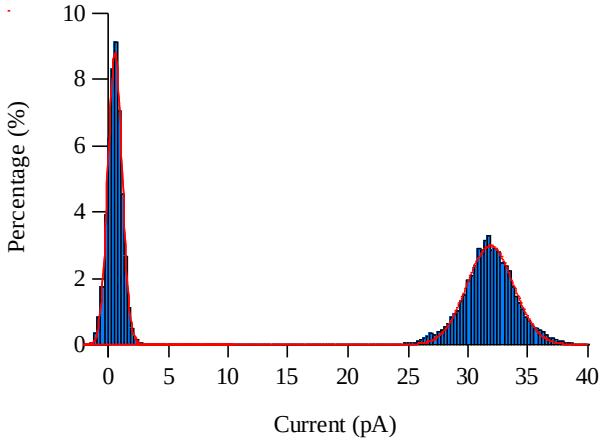
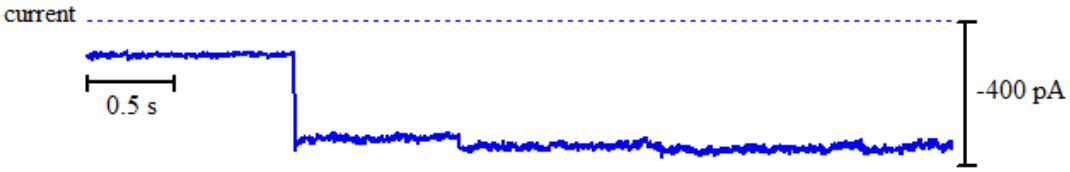


Figure A2 - 25: Above: bilayer activity of **8** with Na^+ ions upon the addition of 100µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.5715 ± 0.0047 pA and peak 2 = 31.83 ± 0.0230 pA.

Recording 3: 1104.00 – 1114.00 s



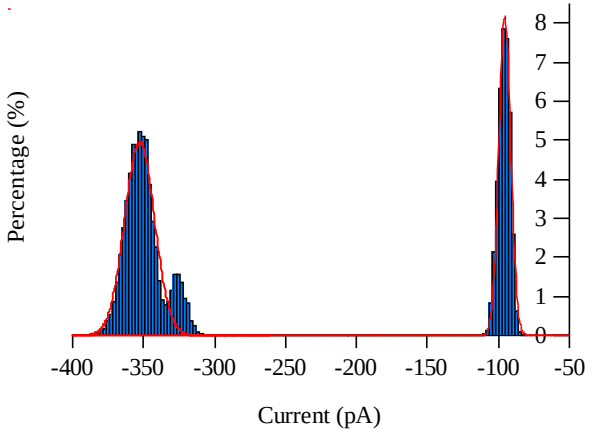


Figure A2 - 26: Above: bilayer activity of **8** with Na^+ ions upon the addition of 175µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = -352.9 ± 0.304 pA and peak 2 = -95.58 ± 0.1352 pA.

Recording 3: 1232.00 – 1238.00 s

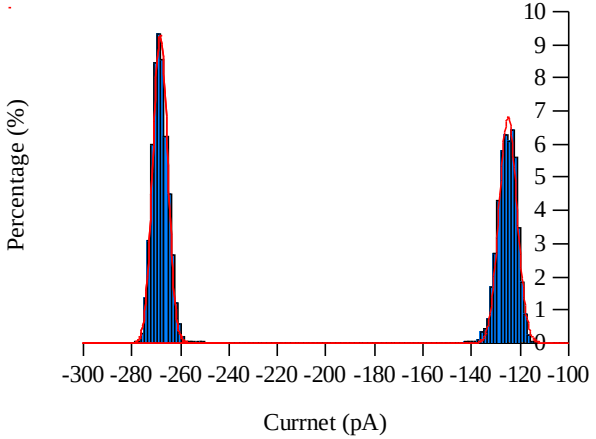


Figure A2 - 27: Above: bilayer activity of **8** with Na^+ ions upon the addition of 175µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = -268.4 ± 0.0413 pA and peak 2 = -125.0 ± 0.0591 pA.

Recording 3: 1544.00 – 1552.00 s

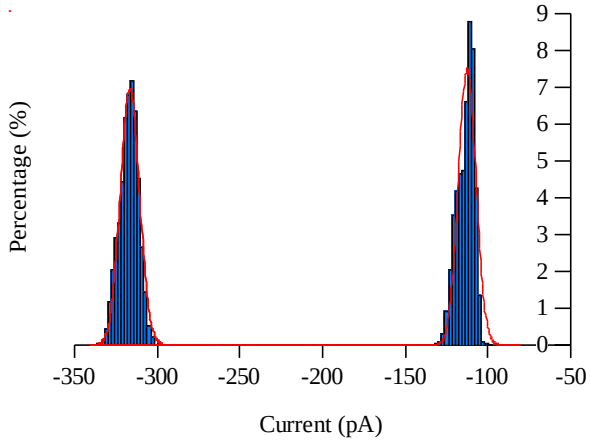
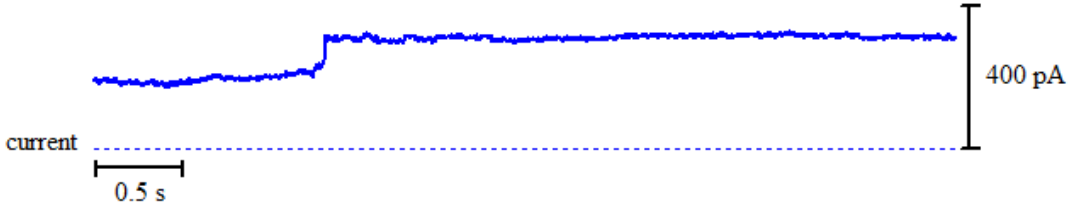


Figure A2 - 28: Above: bilayer activity of **8** with Na^+ ions upon the addition of 175µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = -316.6 ± 0.2497 pA and peak 2 = -112.7 ± 0.2241 pA.

Recording 3: 1701.00 – 1706.00 s



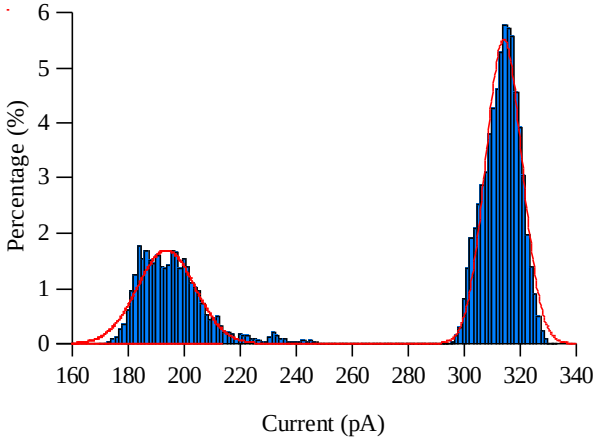


Figure A2 - 29: Above: bilayer activity of **8** with Na^+ ions upon the addition of 175µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 193.4 ± 0.5221 pA and peak 2 = 314.1 ± 0.1313 pA.

Recording 3: 2232.00 – 2242.00 s

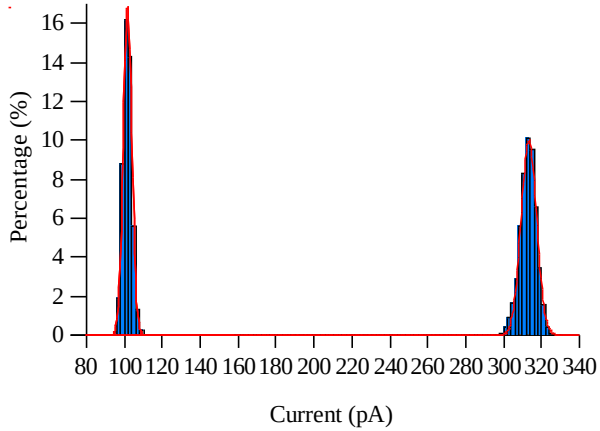
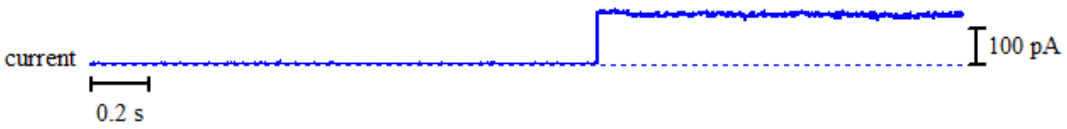


Figure A2 - 30: Above: bilayer activity of **8** with Na^+ ions upon the addition of 250µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 101.7 ± 0.0195 pA and peak 2 = 313.2 ± 0.0346 pA.

Recording 4: 303.00 – 306.00 s



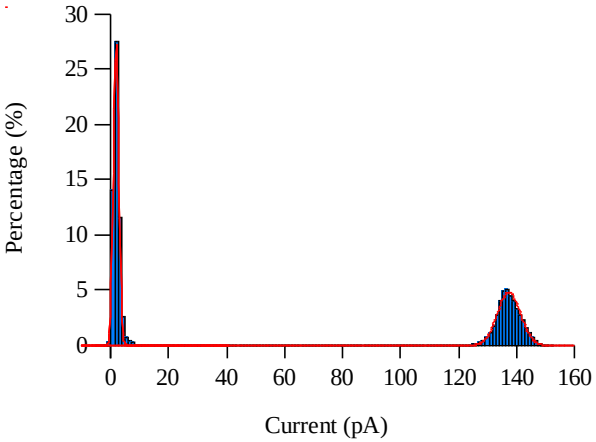
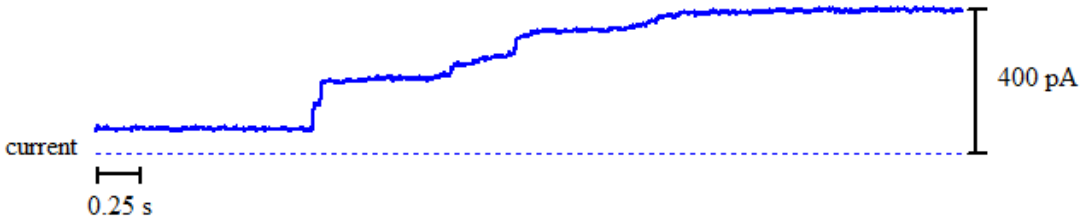


Figure A2 - 31: Above: bilayer activity of **8** with Na^+ ions upon the addition of 100µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.87 ± 0.0150 pA and peak 2 = 137.3 ± 0.1119 pA.

Recording 4: 434.50 – 439.50 s



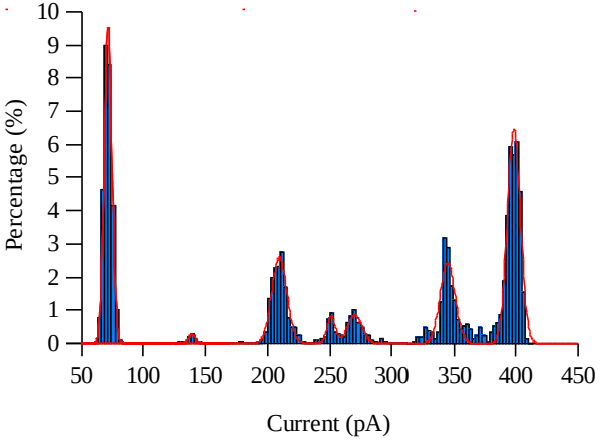
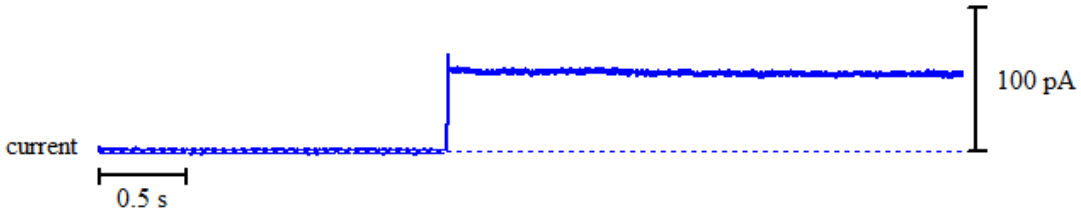


Figure A2 - 32: Above: bilayer activity of **8** with Na^+ ions upon the addition of 100µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 71.21 ± 0.0281 pA, peak 2 = 138.7 ± 1.0160 pA, peak 3 = 208.5 ± 0.2716 pA, peak 4 = 250.4 ± 0.8182 pA, peak 5 = 269.5 ± 0.9469 pA, peak 6 = 344.3 ± 0.7990 pA and peak 7 = 398 ± 0.2874 pA.

Recording 5: 131.25 – 136.25 s



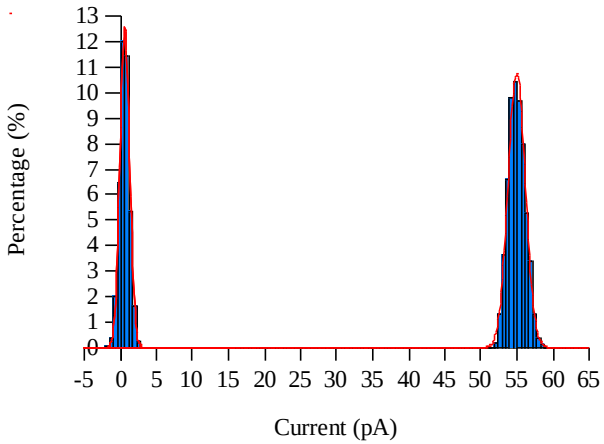
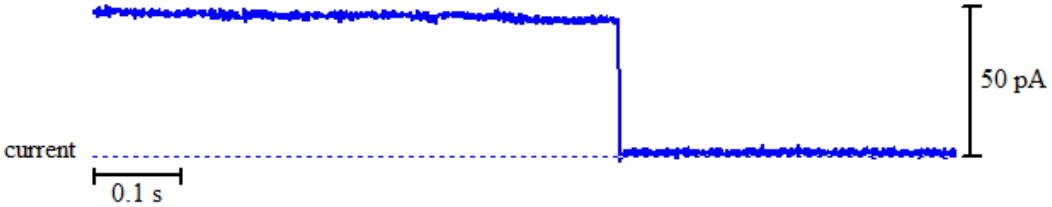


Figure A2 - 33: Above: bilayer activity of **8** with Na^+ ions upon the addition of 50µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.6164 ± 0.0077 pA and peak 2 = 54.92 ± 0.0107 pA.

Recording 5: 154.25 – 156.25 s



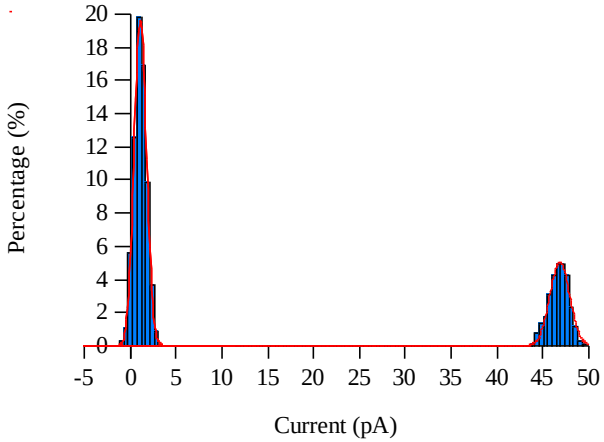


Figure A2 - 34: Above: bilayer activity of **8** with Na^+ ions upon the addition of 50µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 46.77 ± 0.0176 pA and peak 2 = 1.063 ± 0.0038 pA.

Recording 6: 141.80 – 151.80 s

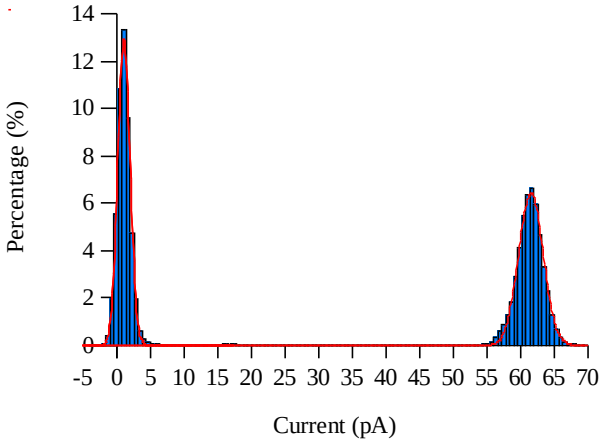
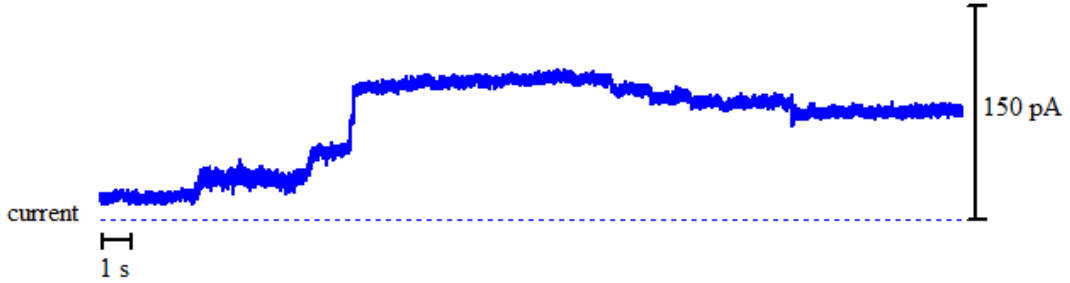


Figure A2 - 35: Above: bilayer activity of **8** with Na^+ ions upon the addition of 25µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.041 ± 0.0073 pA and peak 2 = 61.49 ± 0.0190 pA.

Recording 7: 807.00 – 837.00 s



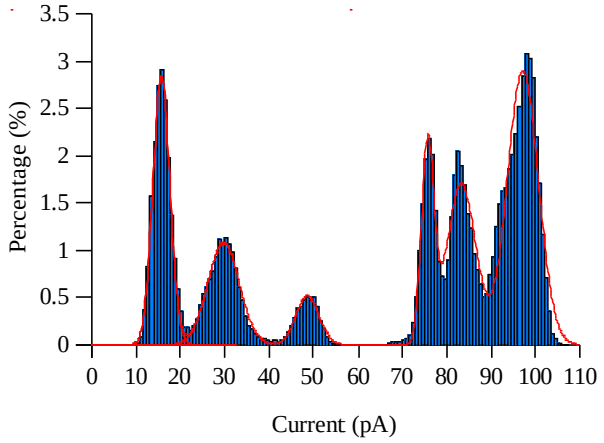
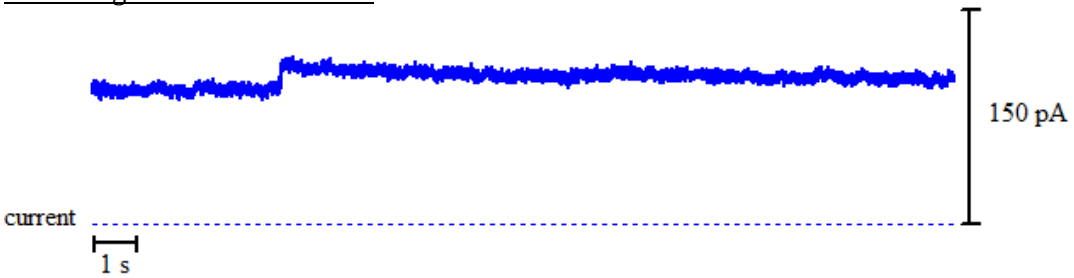


Figure A2 - 36: Above: bilayer activity of **8** with Na^+ ions upon the addition of 175µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 15.73 ± 0.0267 pA, peak 2 = 29.74 ± 0.0967 pA, peak 3 = 48.69 ± 0.1719 pA, peak 4 = 75.59 ± 0.1255 pA, peak 5 = 83.15 ± 0.2860 pA and peak 6 = 97.09 ± 0.1591 pA.

Recording 7: 858.00 – 868.00 s



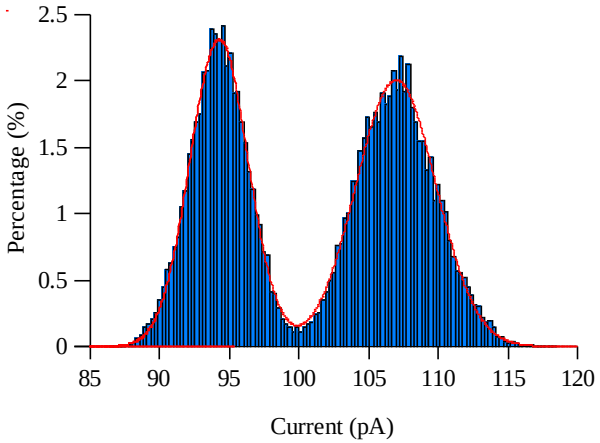
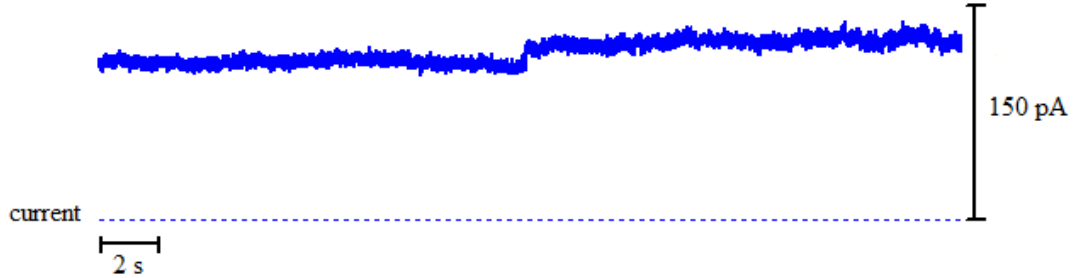


Figure A2 - 37: Above: bilayer activity of **8** with Na^+ ions upon the addition of 175µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 94.23 ± 0.0255 pA and peak 2 = 106.9 ± 0.0334 pA.

Recording 7: 900.00 – 920.00 s



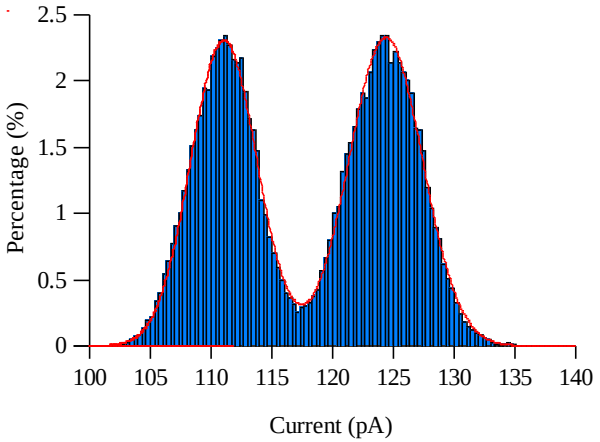
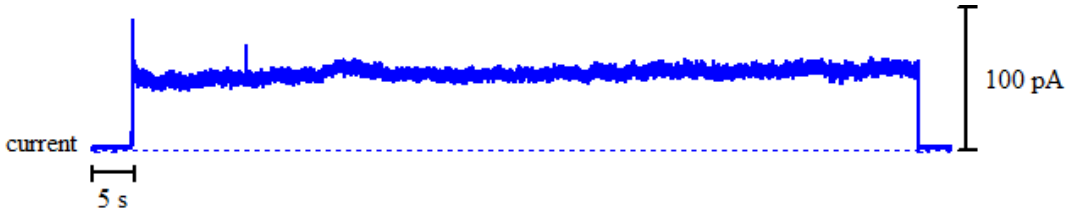


Figure A2 - 38: Above: bilayer activity of **8** with Na^+ ions upon the addition of 175µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 111 ± 0.0275 pA and peak 2 = 124.4 ± 0.0286 pA.

Recording 8: 925.00 – 725.00 s



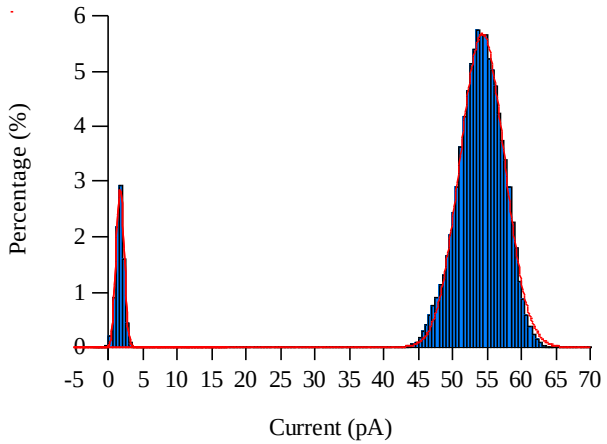
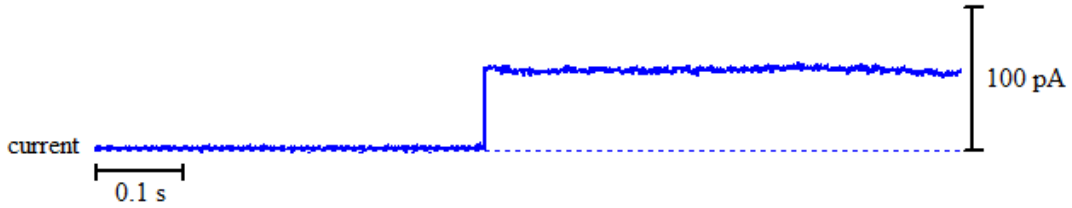


Figure A2 - 39: Above: bilayer activity of **8** with Na^+ ions upon the addition of 175µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.637 ± 0.0184 pA and peak 2 = 54.29 ± 0.0167 pA.

Recording 8: 1107.00 – 1127.00 s



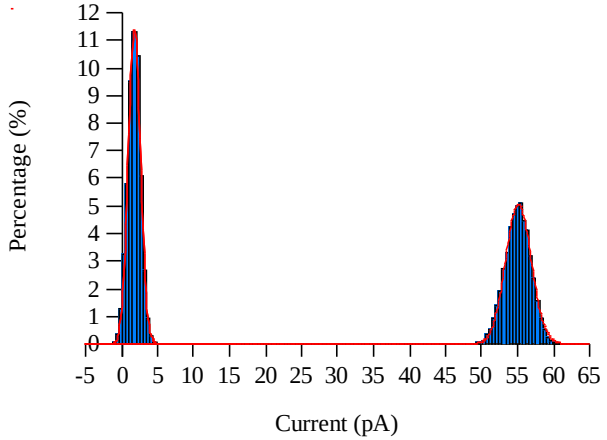
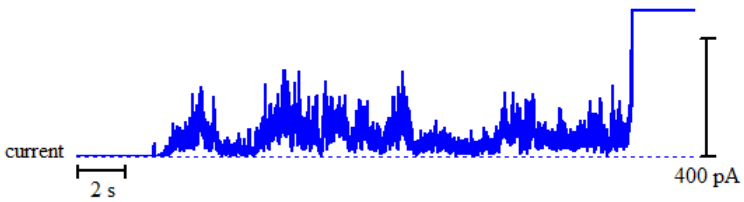
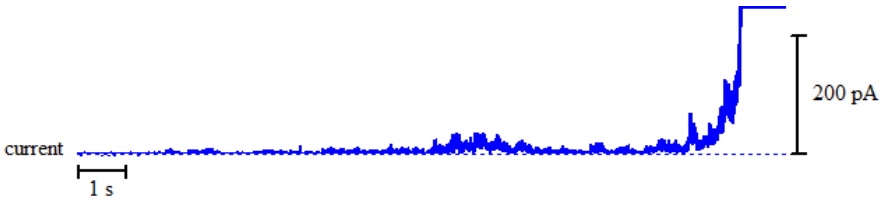


Figure A2 - 40: Above: bilayer activity of **8** with Na^+ ions upon the addition of 300µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.774 ± 0.0060 pA and peak 2 = 55.1 ± 0.0178 pA.

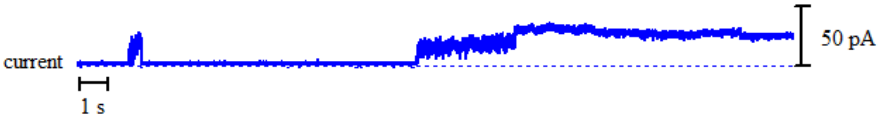
Recording 9: 203.00 – 227.00 s



Recording 10: 289.50 – 302.00 s

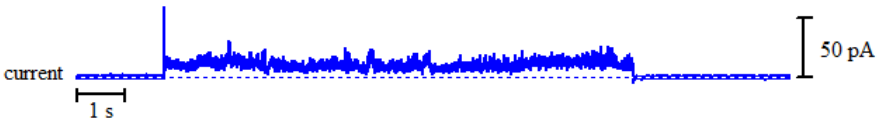


Recording 11: 229.00 – 251.00 s



Recording 11: 317.00 – 337.00 s

Recording 11: 319.00 – 329.00 s



Recording 11: 423.00 – 454.00 s

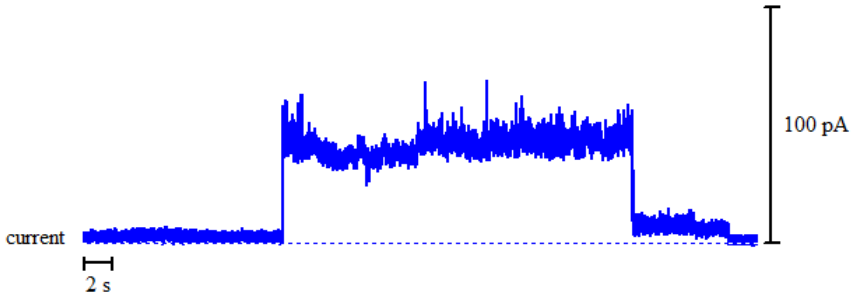
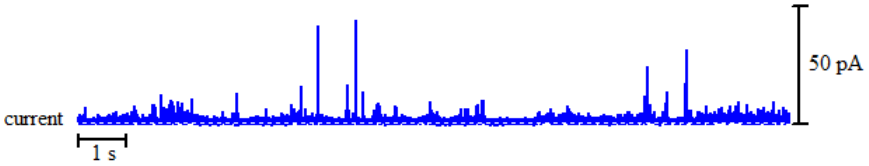
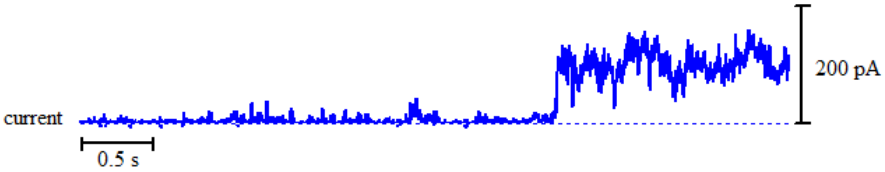


Figure A2 - 41: Bilayer activity of **8** with Na^+ ions upon the addition of 50µl (recordings 9-11) and 75µl (recordings 11- lower) stock solution of **8** in DMSO.

Recording 12: 290.00 – 310.00 s



Recording 13: 416.00 – 421.50 s



Recording 14: 747.00 – 755.00 s

Recording 15: 711.00 – 716.00 s

Recording 16: 1698.40 – 1699.40 s

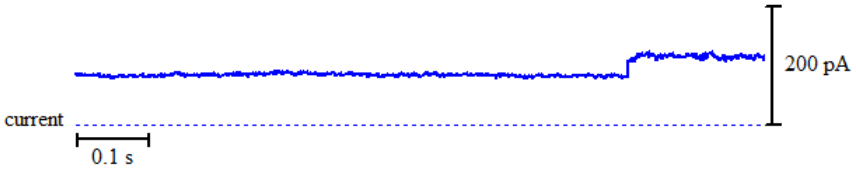
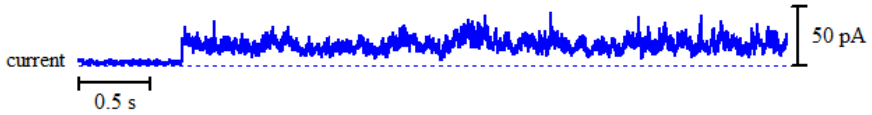
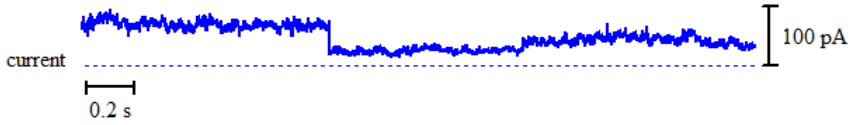


Figure A2 - 42: Bilayer activity of **8** with Na^+ ions upon the addition of 100µl (recording 12), 150µl (recording 13) and 175µl (recordings 14-16) stock solution of **8** in DMSO.

Recording 17: 815.00 – 820.00 s



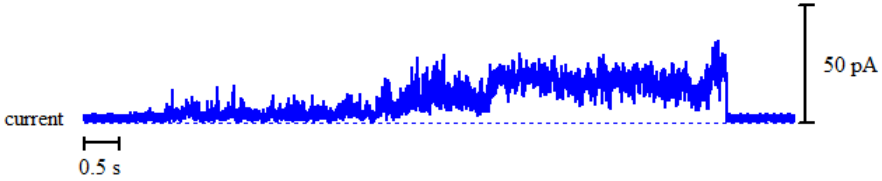
Recording 18: 118.00 - 120.00 s



Recording 19: 1120.00 – 1125.00 s

Recording 19: 118.00 - 120.00 s

Recording 19: 1924.00 – 1939.00 s



Recording 19: 174.00 – 182.00 s

Figure A2 - 43: Bilayer activity of **8** with Na^+ ions upon the addition of 200µl (recordings 17 and 18), 225µl (recording 19- centre) and 250µl (recordings 19 - lower) stock solution of **8** in DMSO.

Planar phospholipid bilayer activity of 8 towards K^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 810.00 – 815.00

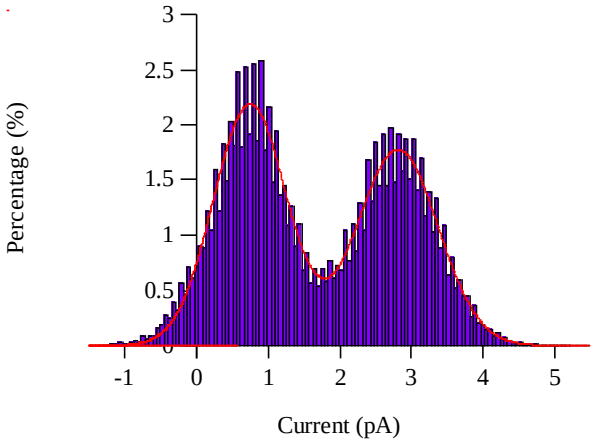


Figure A2 - 46: Above: bilayer activity of **8** with K^+ ions upon the addition of 200µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.7413 ± 0.0143 pA and peak 2 = 2.809 ± 1.0185 pA.

Recording 1: 857.00 – 864.00 s

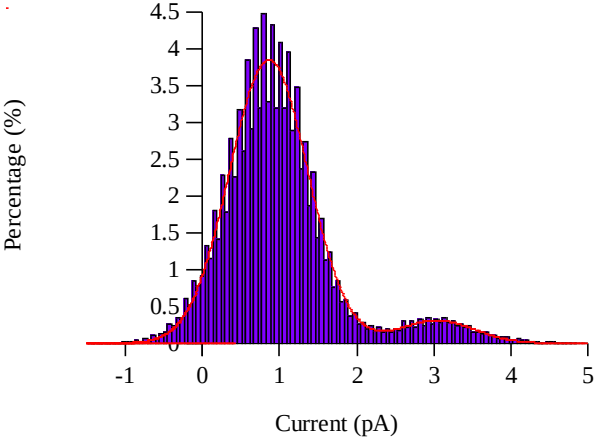
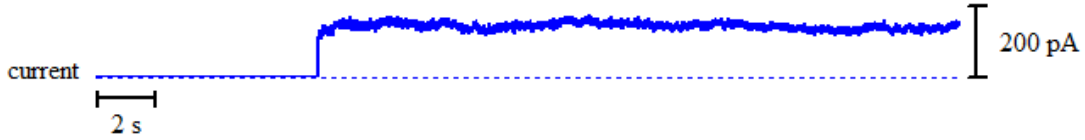


Figure A2 - 44: Above: bilayer activity of **8** with K^+ ions upon the addition of 200µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.8565 ± 0.0107 pA and peak 2 = 3.035 ± 0.129 pA.

Recording 2: 415.00 - 442.50 s



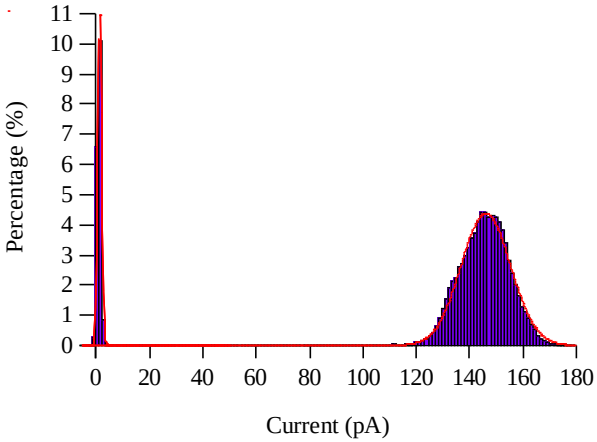
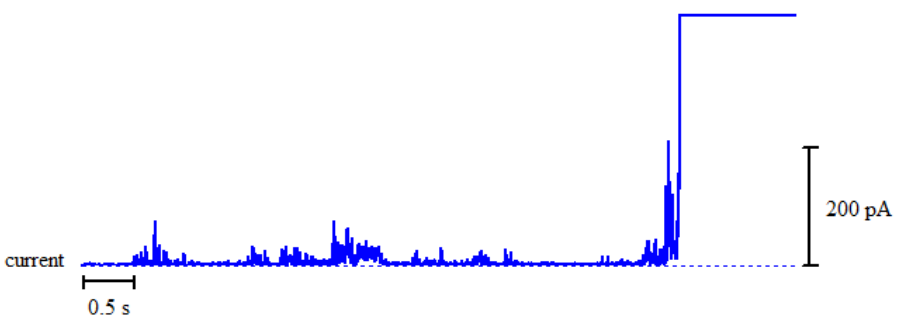


Figure A2 - 45: Above: bilayer activity of **8** with K^+ ions upon the addition of 100µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.343 ± 0.0174 pA and peak 2 = 146.00 ± 0.797 pA.

Recording 3: 229.00 – 251.00 s



Recording 3: 317.00 – 337.00 s

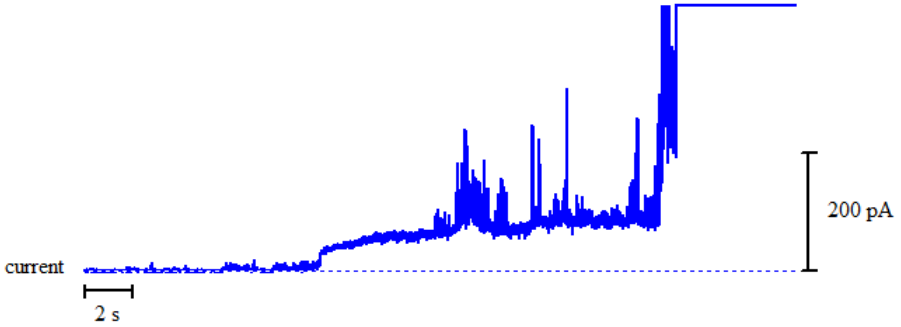
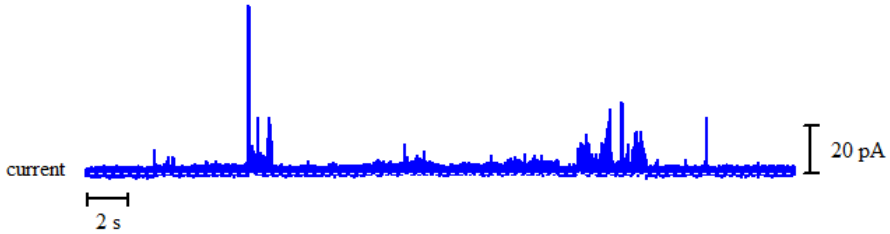
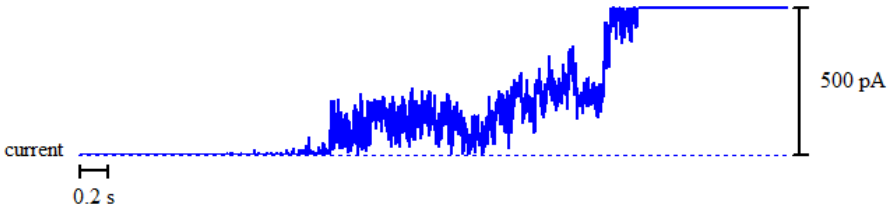


Figure A2 - 47: Bilayer activities of **8** with K^+ ions upon the addition of 50µl stock solution of **8** in DMSO.

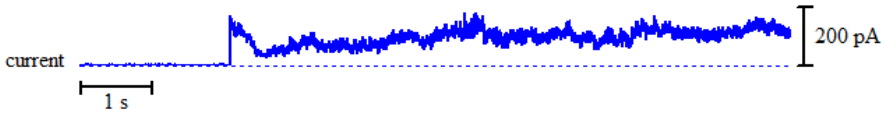
Recording 4: 345.00 – 380.00 s



Recording 4: 410.00 – 440.00 s



Recording 5: 405.00 – 415.00 s



Recording 5: 466.00 – 484.00 s

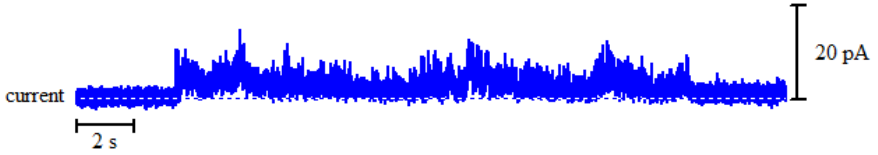
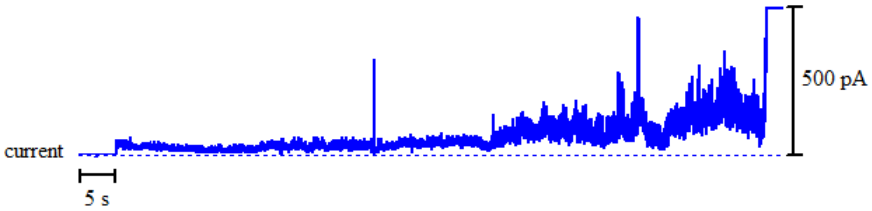
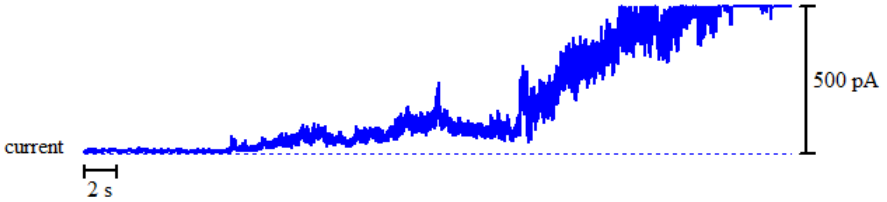


Figure A2 - 48: Bilayer activity of **8** with K^+ ions upon the addition of 75µl (recording 4 – left), 100µl (recording 4 – right) and 100µl (recordings 5) stock solution of **8** in DMSO.

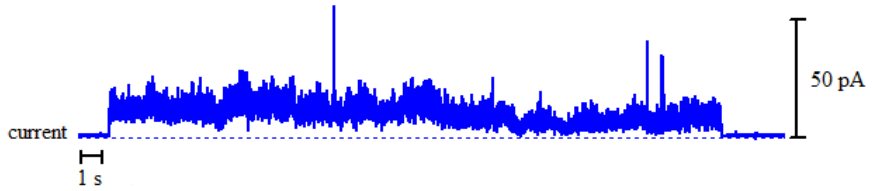
Recording 6: 500.00 – 590.00 s



Recording 7: 831.00 – 863.00 s



Recording 8: 1385.00 – 1415.00 s



Recording 9: 1435.00 – 1460.00 s

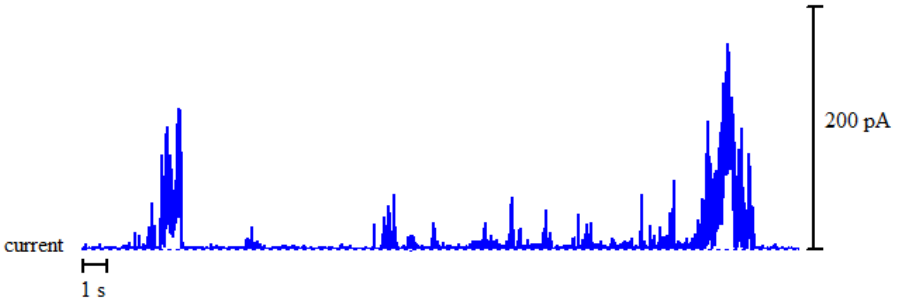


Figure A2 - 49: Bilayer activity of **8** with K^+ ions upon the addition of 125µl (recording 6), 175µl (recording 7) and 300µl (recordings 8 and 9) stock solution of **8** in DMSO.

Planar phospholipid bilayer activity of 8 towards Li^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 245.00 – 255.00 s

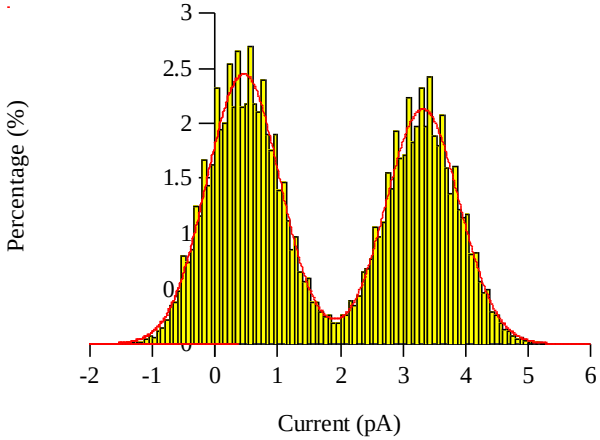


Figure A2 - 50: Above: bilayer activity of **8** with Li^+ ions upon the addition of 50µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.4493 ± 0.0117 pA and peak 2 = 3.316 ± 0.0134 pA.

Recording 2: 104.00 – 113.00 s

Recording 3: 605.00 – 610.00 s

Figure A2 - 51: Bilayer activity of **8** with K^+ ions upon the addition of 25µl (recording 2) and 150µl (recording 3) stock solution of **8** in DMSO.

Planar phospholipid bilayer activity of 8 towards Rb^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 701.00 – 727.00 s

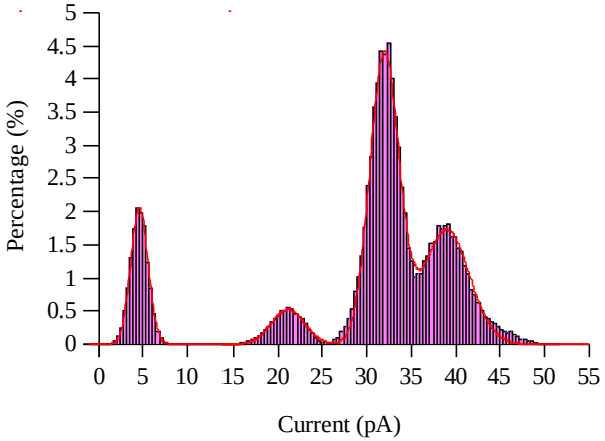
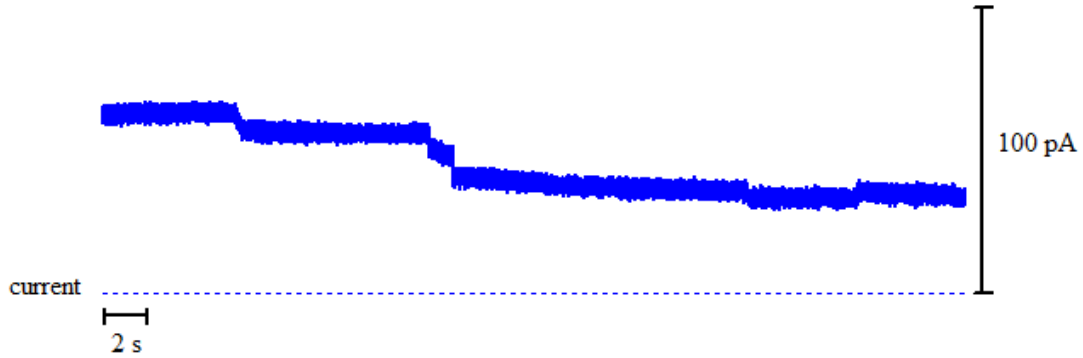


Figure A2 - 52: Above: bilayer activity of **8** with Rb^+ ions upon the addition of 175µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 4.585 ± 0.0056 pA, peak 2 = 21.07 ± 0.1370 pA, peak 3 = 31.95 ± 0.0202 pA and peak 4 = 38.91 ± 0.0653 pA.

Recording 1: 701.00 – 727.00 s



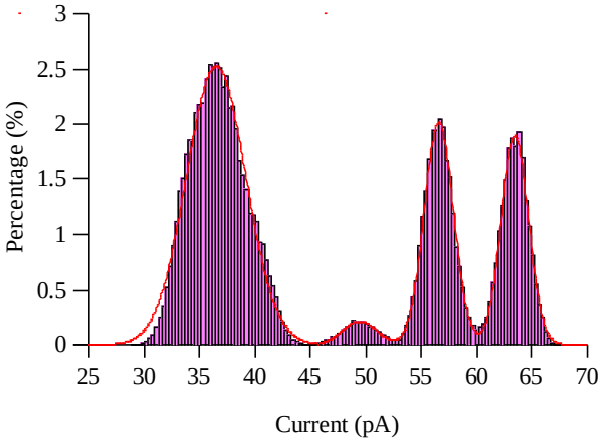


Figure A2 - 53: Above: bilayer activity of **8** with Rb^+ ions upon the addition of 175µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 36.5 ± 0.0407 pA, peak 2 = 49.4 ± 0.0129 pA, peak 3 = 56.54 ± 0.0129 pA and peak 4 = 63.43 ± 0.0136 pA.

Recording 1: 890.00 – 929.00 s

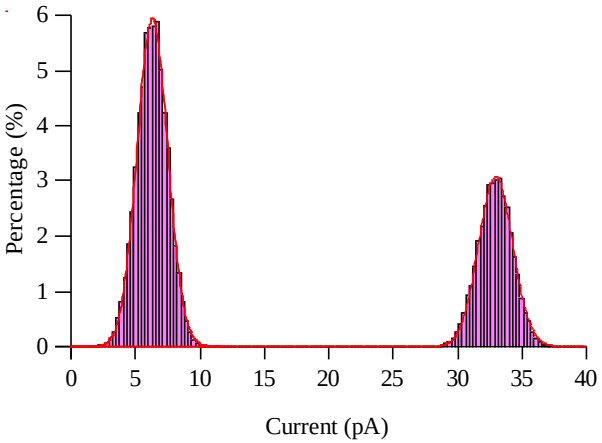


Figure A2 - 54: Above: bilayer activity of **8** with Rb^+ ions upon the addition of 175µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 6.311 ± 0.0050 pA and peak 2 = 32.94 ± 0.0102 pA.

Recording 2: 999.00 – 1019.00 s

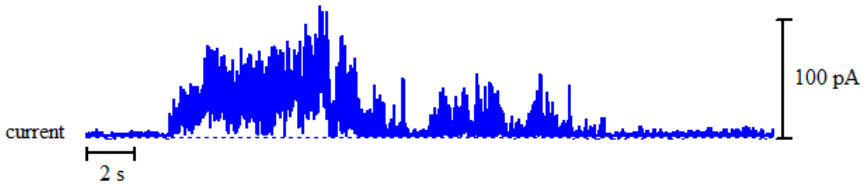
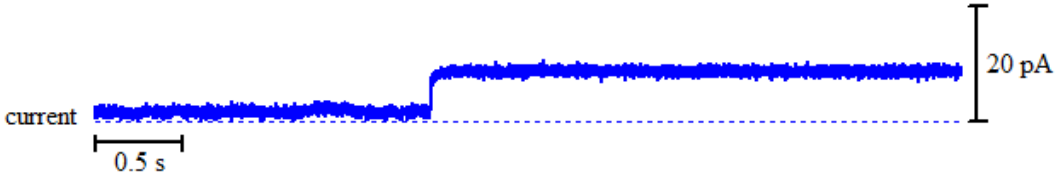


Figure A2 - 55: Bilayer activity of **8** with Rb^+ ions upon the addition of 200µl (recording 2) stock solution of **8** in DMSO.

Planar phospholipid bilayer activity of 8 towards Cs^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 777.00 – 782.00 s



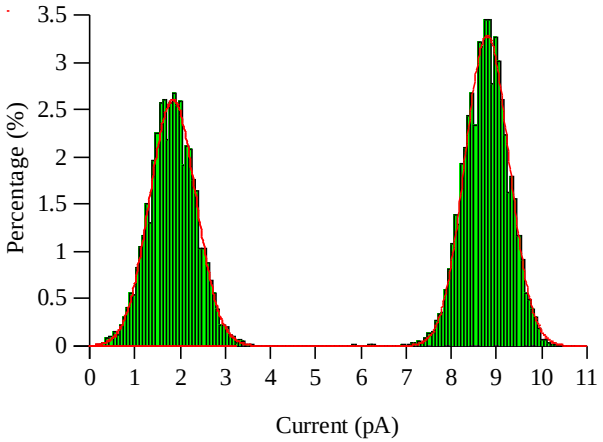
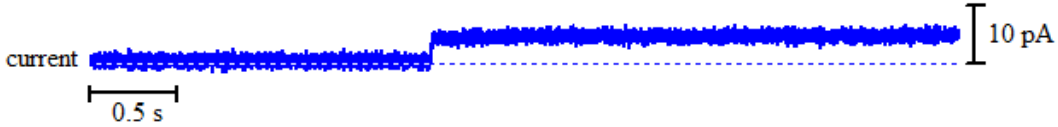


Figure A2 - 56: Above: bilayer activity of **8** with Cs^+ ions upon the addition of 175µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.837 ± 0.0088 pA and peak 2 = 8.788 ± 0.0068 pA.

Recording 2: 144.50 - 149.50 s



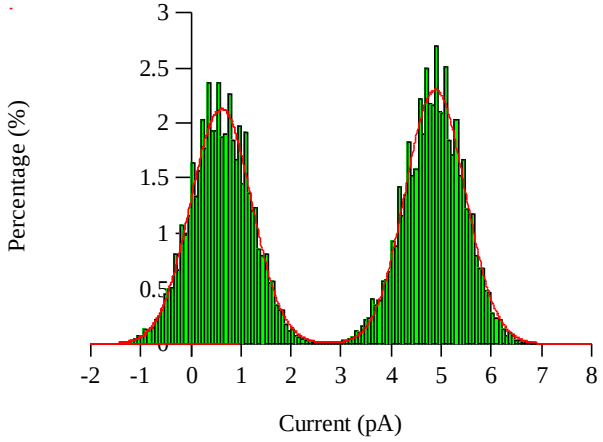
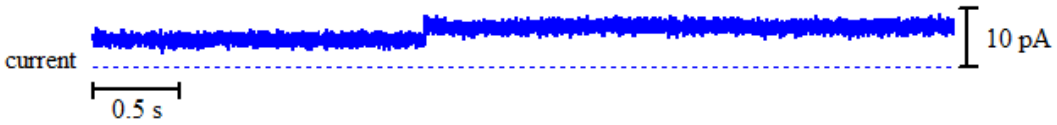


Figure A2 - 57: Above: bilayer activity of **8** with Cs^+ ions upon the addition of 25µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.601 ± 0.0135 pA and peak 2 = 4.875 ± 0.0124 pA.

Recording 2: 372.5 - 377.5 s



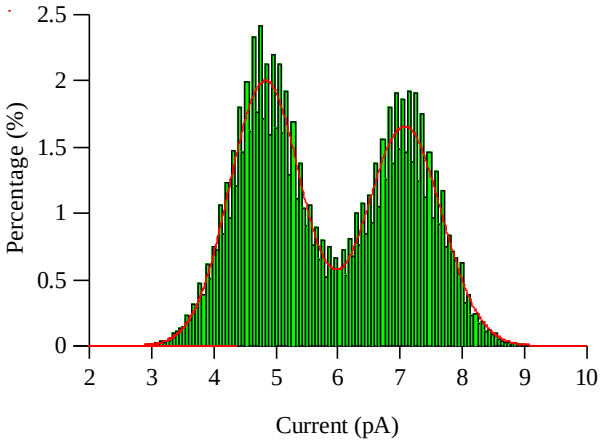
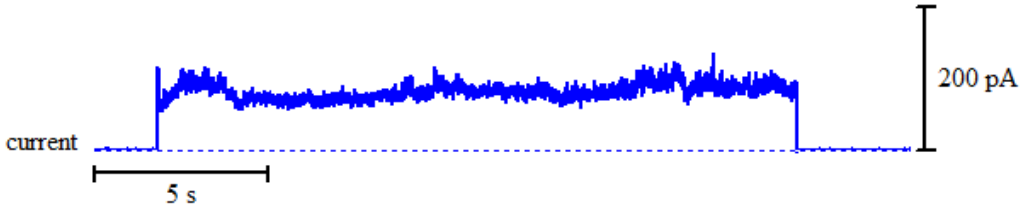


Figure A2 - 58: Above: bilayer activity of **8** with Cs^+ ions upon the addition of 75µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 4.823 ± 0.0165 pA and peak 2 = 7.062 ± 0.0203 pA.

Recording 3: 725 - 750 s



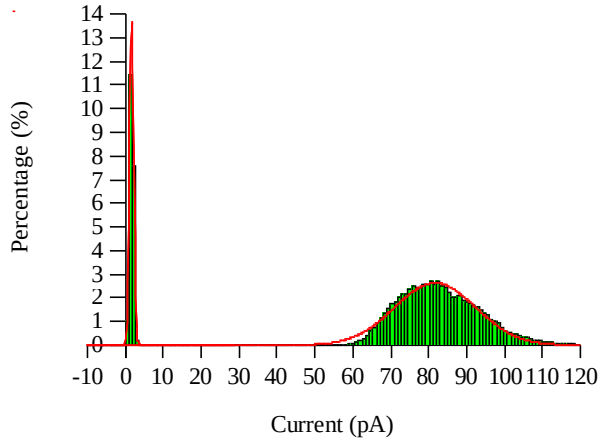
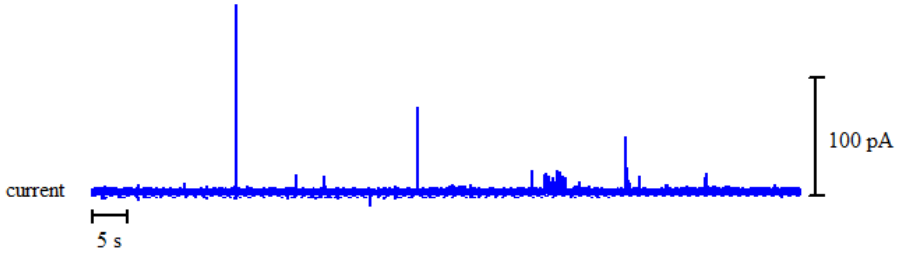


Figure A2 - 59: Above: bilayer activity of **8** with Cs^+ ions upon the addition of 175µl stock solution of **8** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.659 ± 0.0125 pA and peak 2 = 81.59 ± 0.1376 pA.

Recording 4: 410.00 – 450.00 s

Recording 5: 650.00 – 750.00 s



Recording 6: 635.00 – 665.00 s

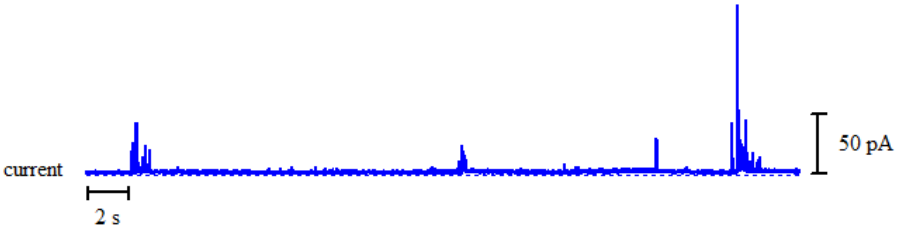
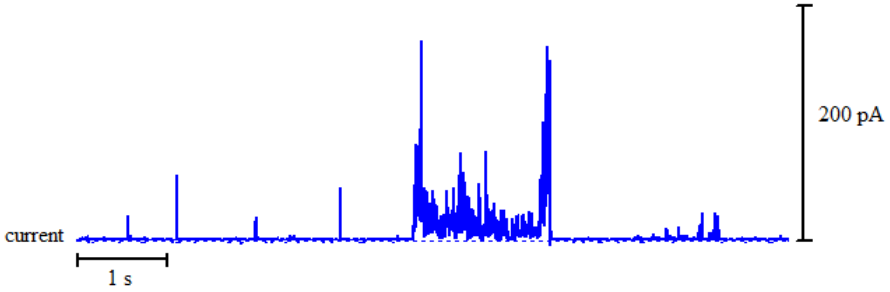
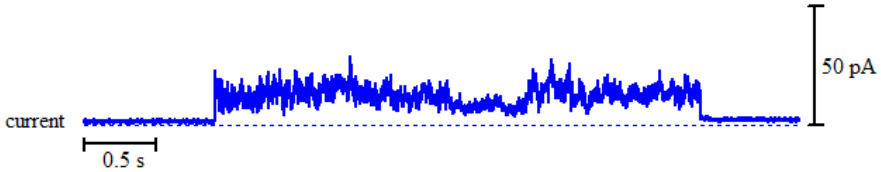


Figure A2 - 60: Bilayer activity of **8** with Cs^+ ions upon the addition of 100µl (recording 4) and 150µl (recordings 5 and 6) stock solution of **8** in DMSO.

Recording 7: 150.00 – 155.00 s



Recording 7: 796.00 – 799.00 s



Recording 7: 805.00 – 825.00 s

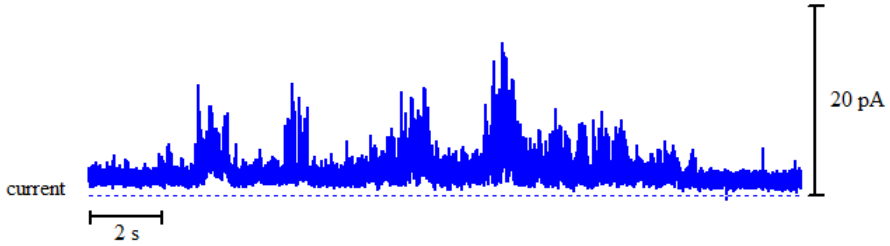
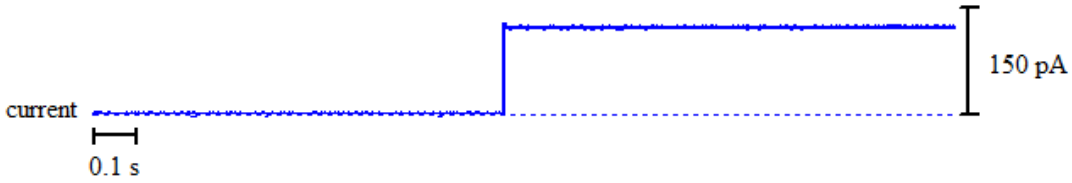


Figure A2 - 61: Bilayer activity of **8** with Cs^+ ions upon the addition of 25µl (recording 7 – upper), 175µl (recording 7) and 200µl (recording 7 – lower) stock solution of **8** in DMSO.

Planar phospholipid bilayer activity of 9 towards Na^+ across the POPE and POPS bilayer system

Recording 1: 305.70 - 307.70 s



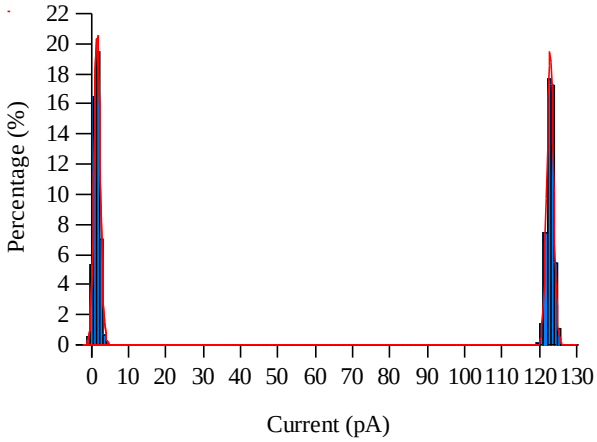


Figure A2 - 62: Above: bilayer activity of **9** with Na^+ ions upon the addition of 75µl stock solution of **9** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.605 ± 0.0071 pA and peak 2 = 122.9 ± 0.0074 pA.

Recording 2: 190.00 – 197.00 s

Recording 2: 469.00 – 479.00 s

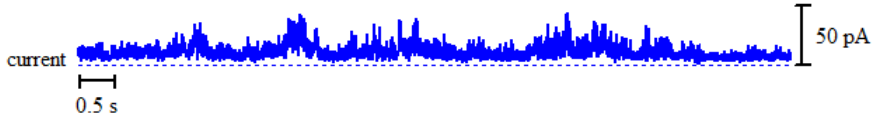
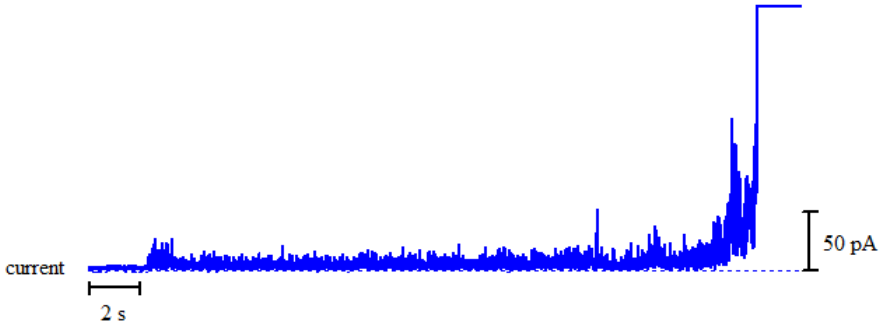


Figure A2 - 63: Bilayer activity of **9** with Na^+ ions upon the addition of 25µl (recording 2 – left) and 100µl (recording 2 – right) stock solution of **8** in DMSO.

Recording 3: 190.00 – 197.00 s



Recording 4: 469.00 – 479.00 s

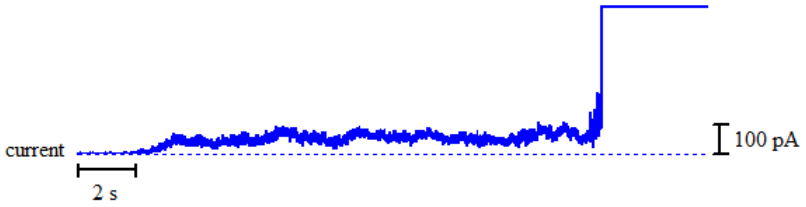


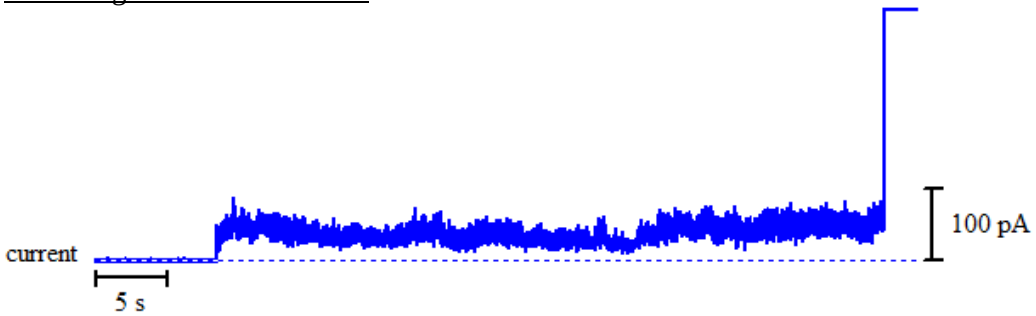
Figure A2 - 64: Bilayer activity of **9** with Na^+ ions upon the addition of 100µl (recordings 3 and 4) stock solution of **8** in DMSO.

Planar phospholipid bilayer activity of 9 towards K^+ across the POPE and POPS bilayer system

Due to experimental limitations, the ion channel activity of **9** towards K^+ was unable to be investigated across this bilayer system.

Planar phospholipid bilayer activity of 9 towards Na^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 173.00 - 223.00 s



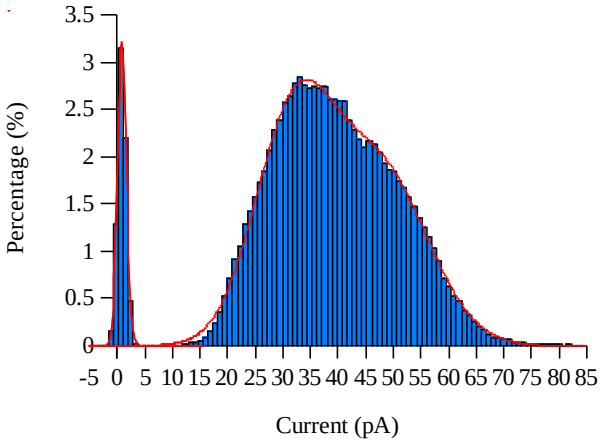
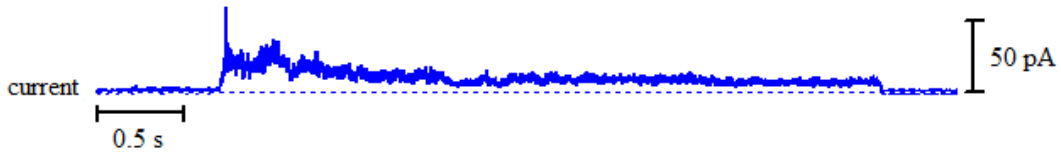


Figure A2 - 65: Above: bilayer activity of **9** with Na^+ ions upon the addition of 25µl stock solution of **9** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.8466 ± 0.0138 pA, peak 2 = 31.92 ± 0.2449 pA and peak 3 = 47.53 ± 0.456 pA.

Recording 2: 225.00 - 235.00 s



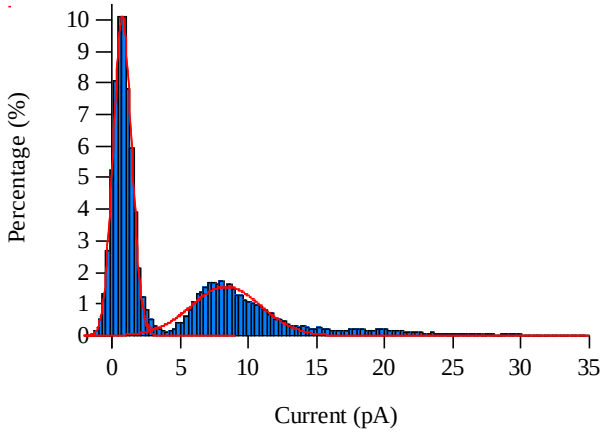
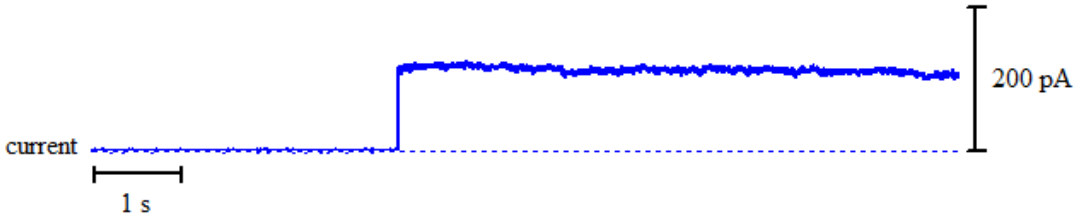


Figure A2 - 66 Above: bilayer activity of **9** with Na^+ ions upon the addition of 50µl stock solution of **9** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.7661 ± 0.0100 pA and peak 2 = 8.237 ± 0.1265 pA.

Recording 2: 307.00 - 357.00 s



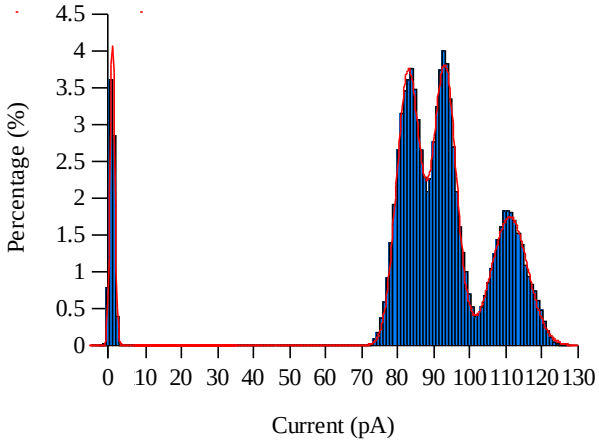
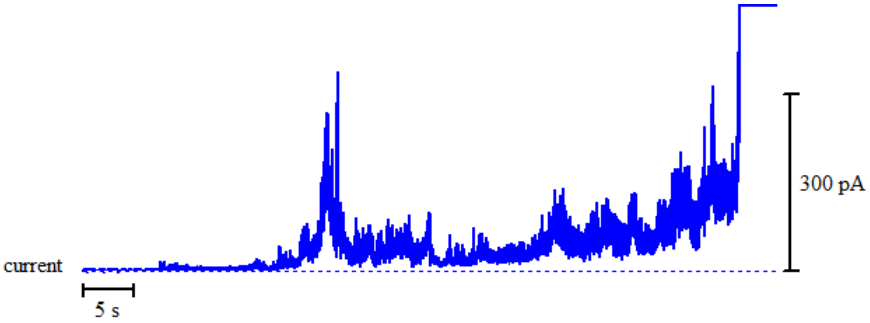


Figure A2 - 67: Above: bilayer activity of **9** with Na^+ ions upon the addition of 75µl stock solution of **9** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.18 ± 0.0004 pA, peak 2 = 111 ± 0.1246 pA, peak 3 = 92.95 ± 0.0537 pA and peak 4 = 82.85 ± 0.0454 pA.

Recording 3: 777.00 – 835.00 s



Recording 4: 1243.00 – 1293.00 s

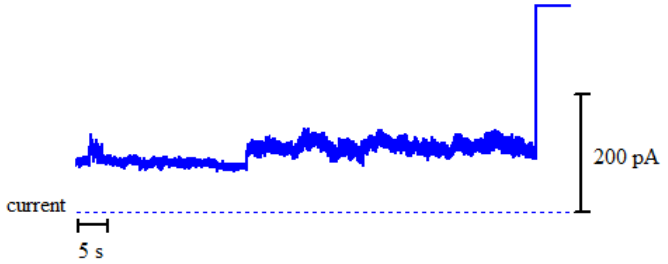
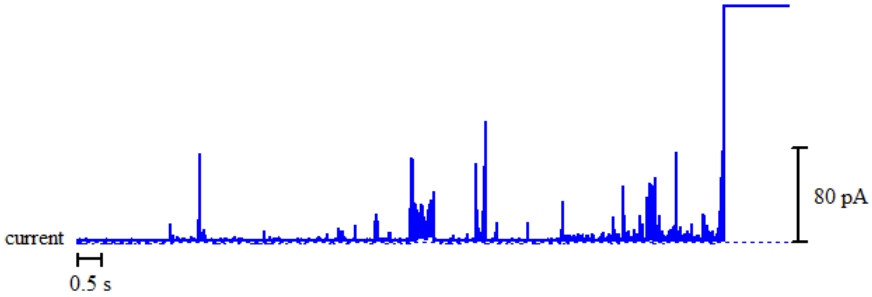


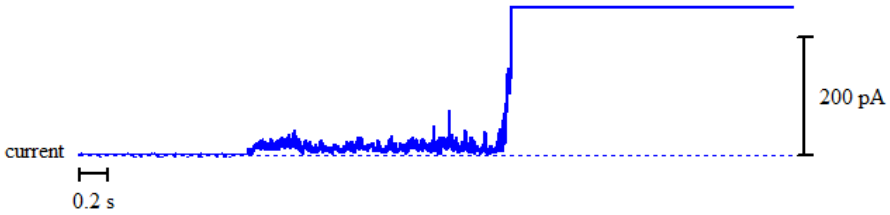
Figure A2 - 68: Bilayer activity of **9** with Na^+ ions upon the addition of 150µl (recordings 7 and 8) stock solution of **8** in DMSO.

Planar phospholipid bilayer activity of 9 towards K^+ across the DLPE, DLPS and cholesterol bilayer system

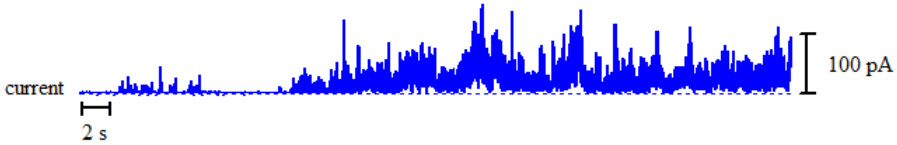
Recording 1: 108.50 - 123.50 s



Recording 2: 160.00 - 163.00 s



Recording 3: 362.00 - 372.00 s



Recording 4: 344.00 - 394.00 s

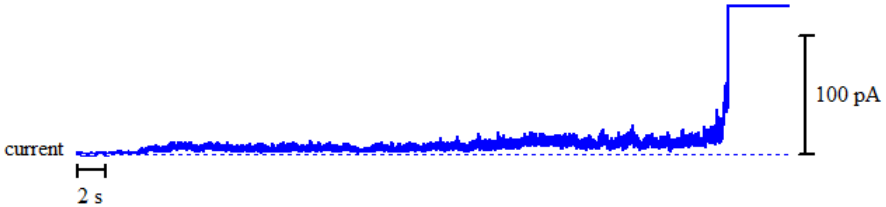
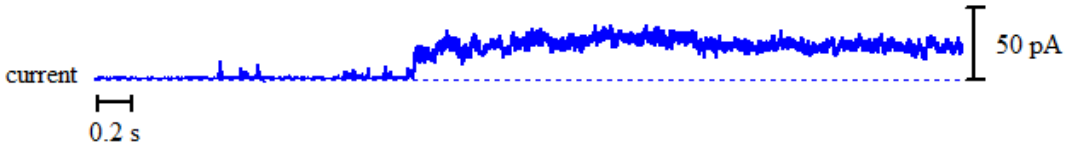


Figure A2 - 69: Bilayer activity of **9** with K^+ ions upon the addition of 25µl (recording 1 and 2) and 75µl (recording 3 and 4) stock solution of **9** in DMSO.

Planar phospholipid bilayer activity of 10 towards Na^+ across the POPE and POPS bilayer system

Recording 1: 310.50 - 315.50 s



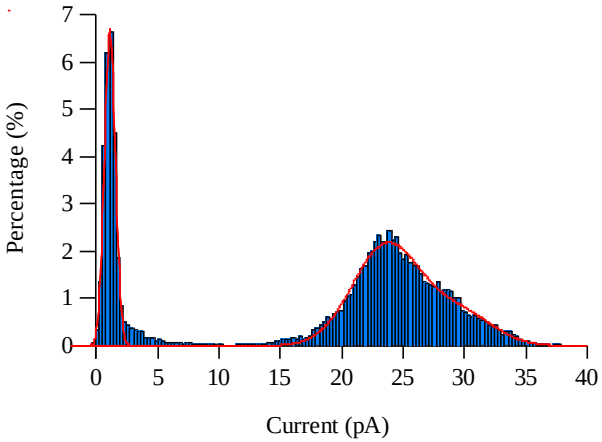
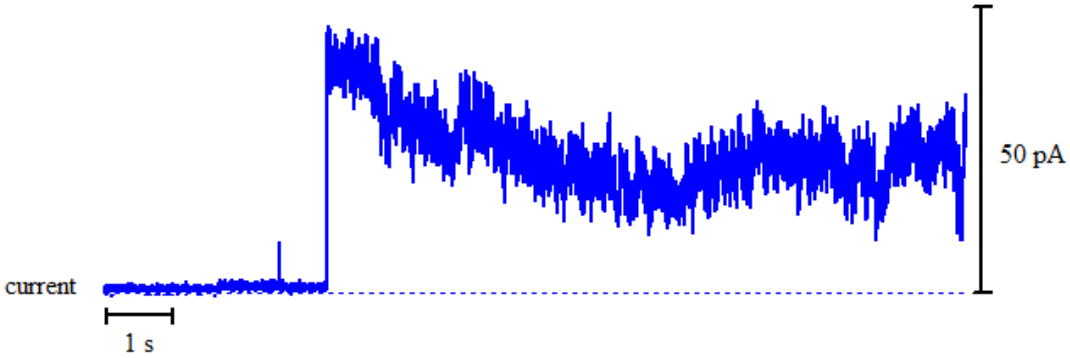


Figure A2 - 70: Above: bilayer activity of **10** with Na^+ ions upon the addition of 75µl stock solution of **10** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.108 ± 0.0072 pA and peak 2 = 23.63 ± 0.2292 pA.

Recording 2: 507.30 - 311.30 s



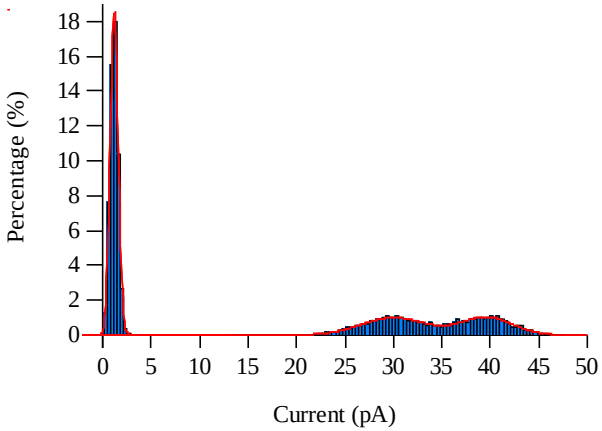
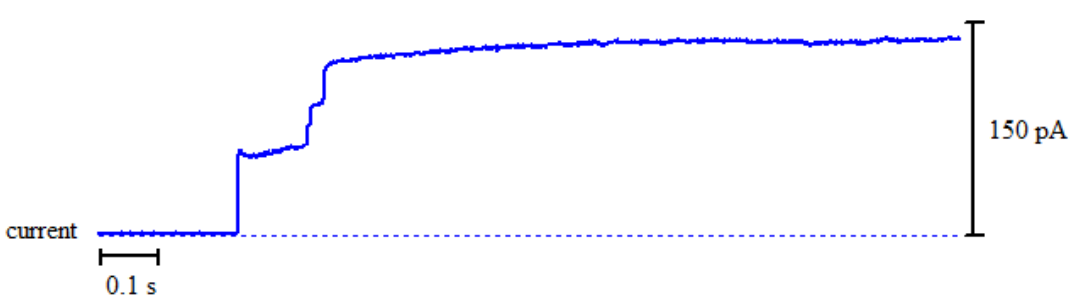


Figure A2 - 71: Above: bilayer activity of **10** with Na^+ ions upon the addition of 100µl stock solution of **10** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.182 ± 0.0021 pA, peak 2 = 29.94 ± 0.1419 pA and peak 3 = 39.55 ± 0.1226 pA.

Recording 3: 282.70 - 283.70 s



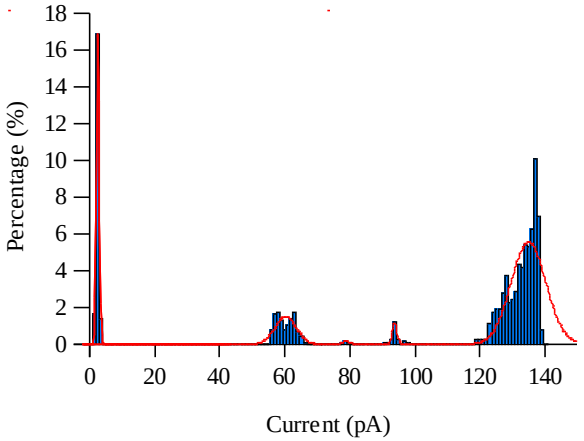
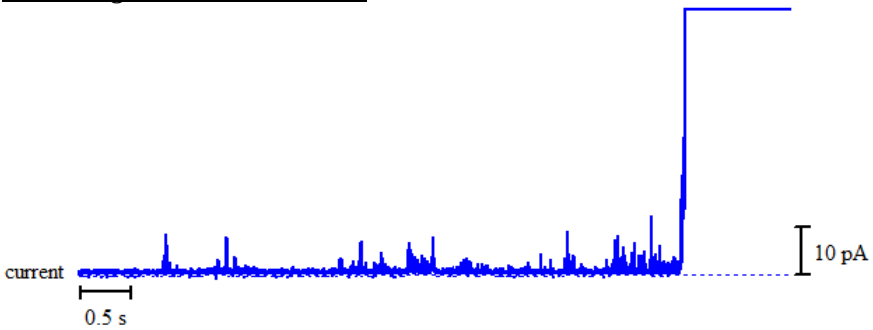
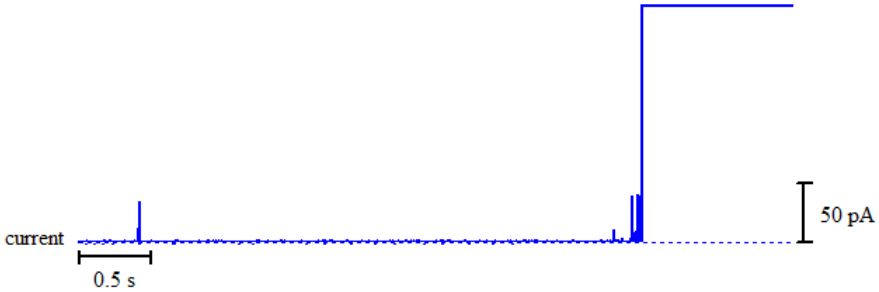


Figure A2 - 72: Above: bilayer activity of **10** with Na^+ ions upon the addition of 100µl stock solution of **10** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 2.538 ± 0.0144 pA, peak 2 = 60.33 ± 0.2579 pA, peak 3 = 78.63 ± 9.275 pA, peak 4 = 93.6 ± 1.502 pA and peak 5 = 135 ± 0.6027 pA.

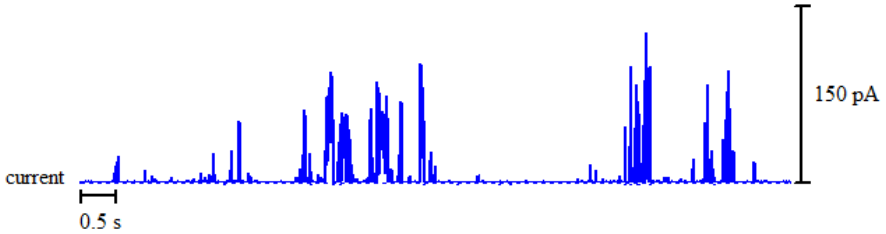
Recording 4: 353.00 - 360.00 s



Recording 5: 507.00 - 512.00 s



Recording 6: 599.00 - 609.00 s



Recording 6: 614.00 – 640.00 s

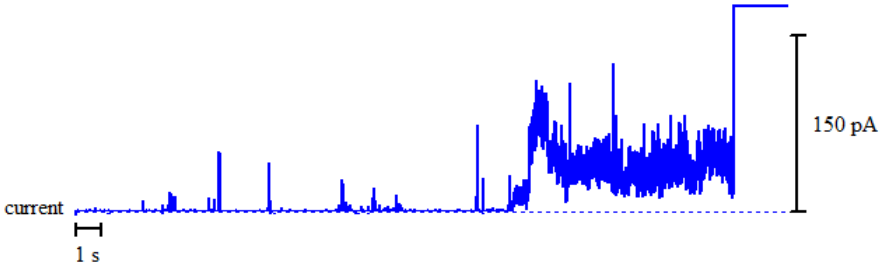
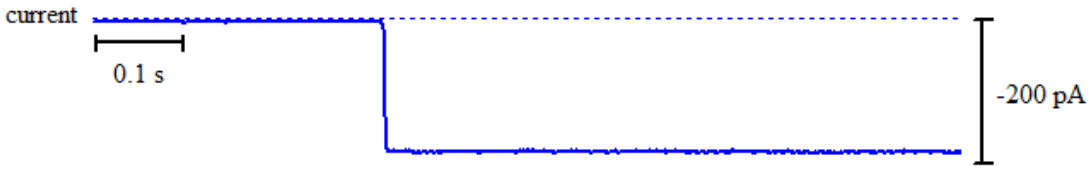


Figure A2 - 73: Bilayer activity of **10** with Na^+ ions upon the addition of 75µl (recording 4), 125µl (recording 5 and 6 - left) and 150µl (recording 6 - right) stock solution of **10** in DMSO.

Planar phospholipid bilayer activity of 10 towards K^+ across the POPE and POPS bilayer system

Recording 1: 377.40 – 378.40 s



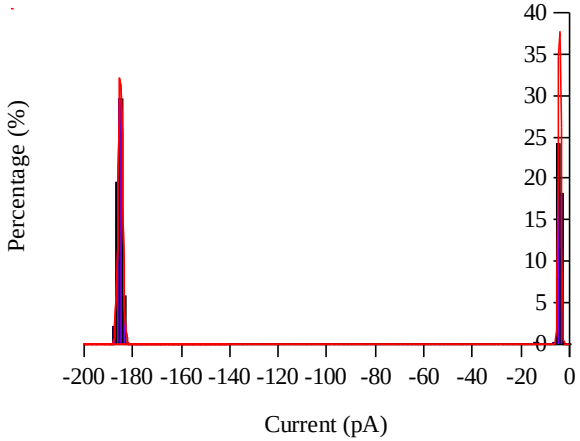
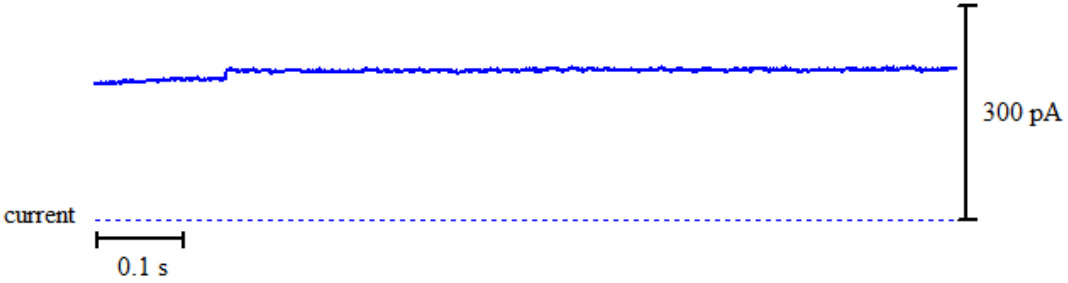


Figure 3.1.80: Above: bilayer activity of **10** with K^+ ions upon the addition of 75µl stock solution of **10** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = -185.1 ± 0.0035 pA and peak 2 = -4.132 ± 0.0032 pA.

Recording 1: 395.22 – 396.22 s



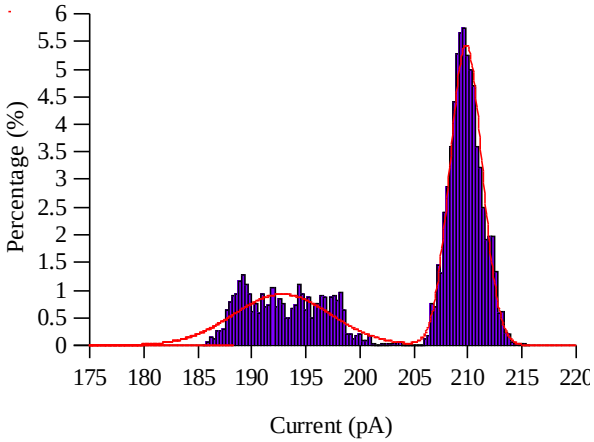
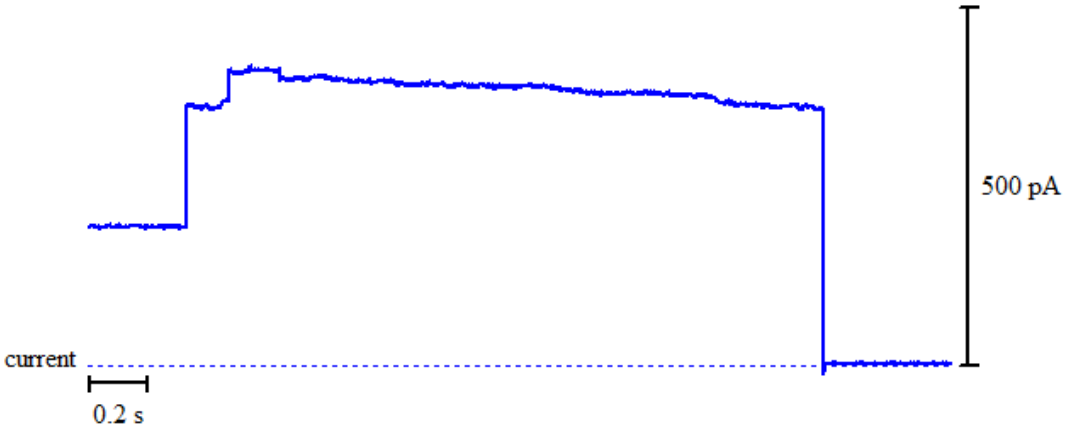


Figure A2 - 74: Above: bilayer activity of **10** with K^+ ions upon the addition of 75µl stock solution of **10** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 192.8 ± 0.3911 pA and peak 2 = 209.8 ± 0.0512 pA.

Recording 1: 395.22 – 396.22 s



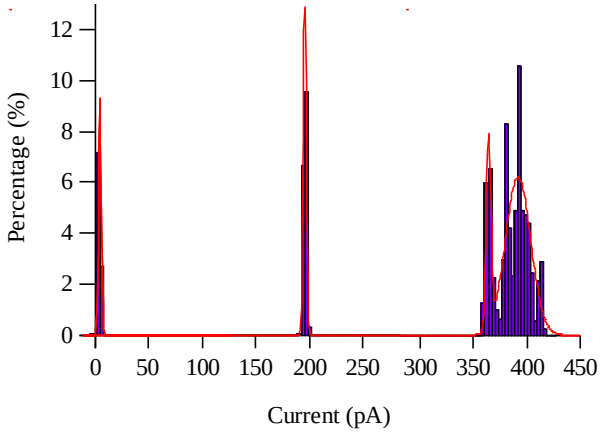
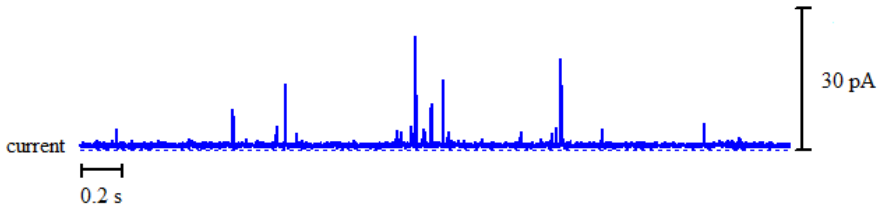


Figure A2 - 75: Above: bilayer activity of **10** with K^+ ions upon the addition of 75µl stock solution of **10** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 4.765 ± 0.0104 pA, peak 2 = 195.8 ± 0.0094 pA, peak 3 = 364.5 ± 1.2290 pA and peak 4 = 391.8 ± 0.4682 pA.

Recording 2: 659.00 –663.00 s



Recording 2: 674.50 – 676.40 s

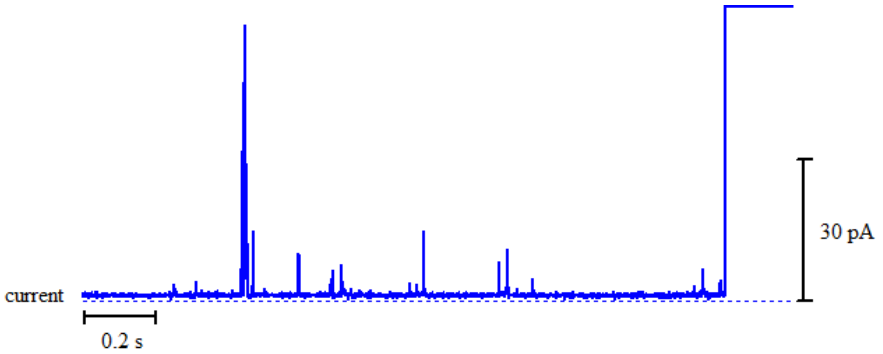
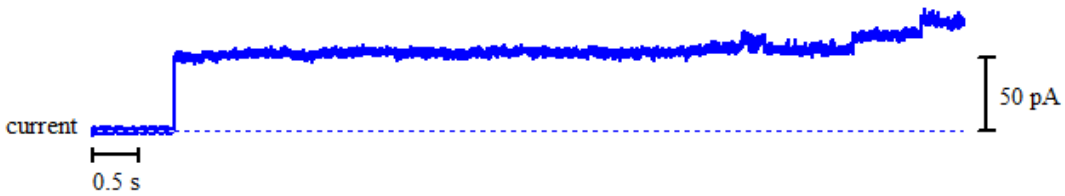


Figure A2 - 76: Bilayer activity of **10** with Na^+ ions upon the addition of 125µl (recordings 2), stock solution of **10** in DMSO.

Planar phospholipid bilayer activity of 10 towards Na^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 199.00 - 208.50 s



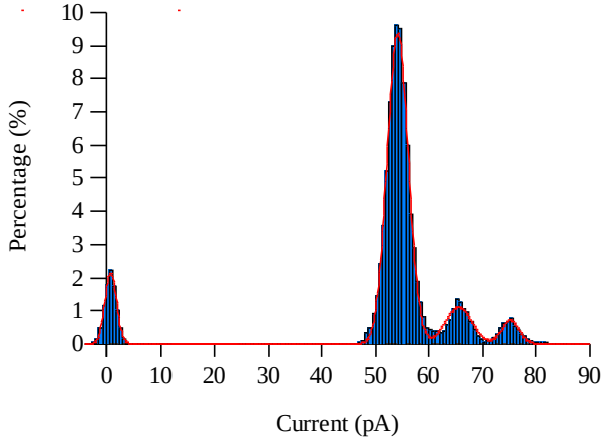


Figure A2 - 77: Above: bilayer activity of **10** with Na^+ ions upon the addition of 25µl stock solution of **10** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.6628 ± 0.0156 pA, peak 2 = 54.08 ± 0.0242 pA, peak 3 = 65.41 ± 0.2389 pA and peak 4 = 75.03 ± 0.3199 pA.

Recording 2: 803.60 - 808.60 s

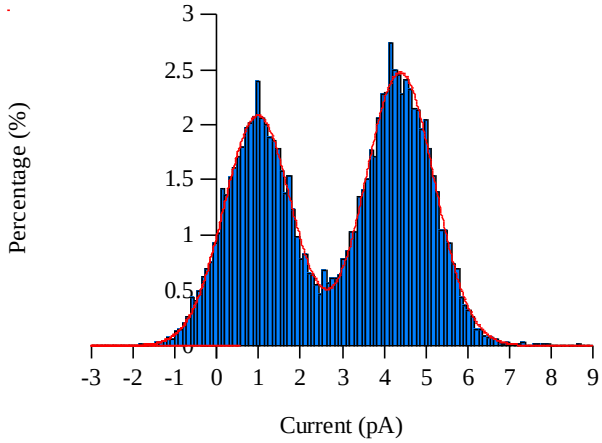
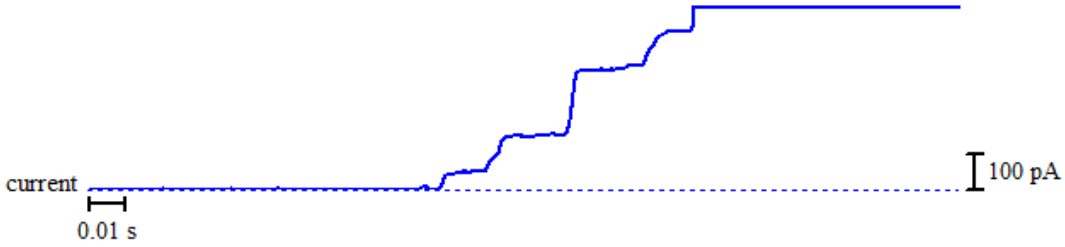


Figure A2 - 78: Above: bilayer activity of **10** with Na^+ ions upon the addition of 200µl stock solution of **10** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.9736 ± 0.0106 pA and peak 2 = 4.382 ± 0.0090 pA.

Recording 3: 100.02 – 100.12 s



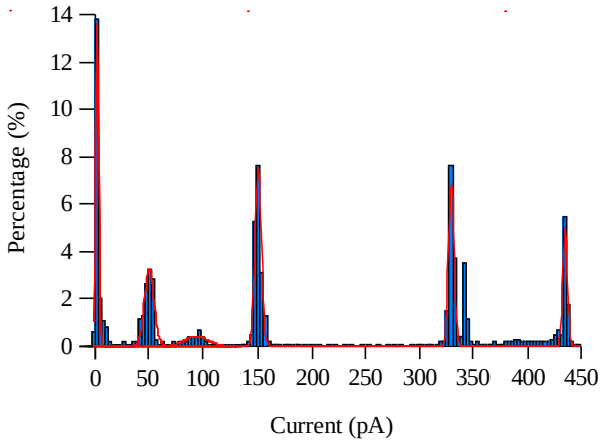


Figure A2 - 79: Above: bilayer activity of **10** with Na^+ ions upon the addition of 25µl stock solution of **10** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 2.228 ± 0.0500 pA, peak 2 = 50.7 ± 0.4058 pA, peak 3 = 94.28 ± 4.5320 pA, peak 4 = 149.9 ± 0.2852 pA, peak 5 = 330.1 ± 0.3153 pA and peak 6 = 435 ± 0.4353 pA.

Recording 4: 199.00 – 205.00 s

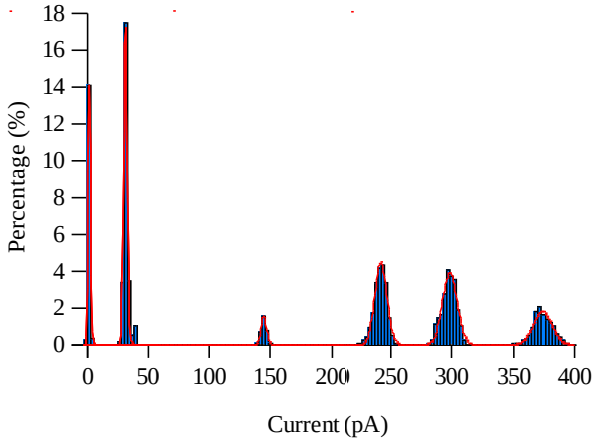


Figure A2 - 80: Above: bilayer activity of **10** with Na^+ ions upon the addition of 25µl stock solution of **10** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 2.071 ± 0.2221 pA, peak 2 = 31.5 ± 0.0511 pA, peak 3 = 144.2 ± 0.0162 pA, peak 4 = 241.7 ± 0.1588 pA, peak 5 = 298.1 ± 0.2119 pA and peak 6 = 373.7 ± 0.4968 pA.

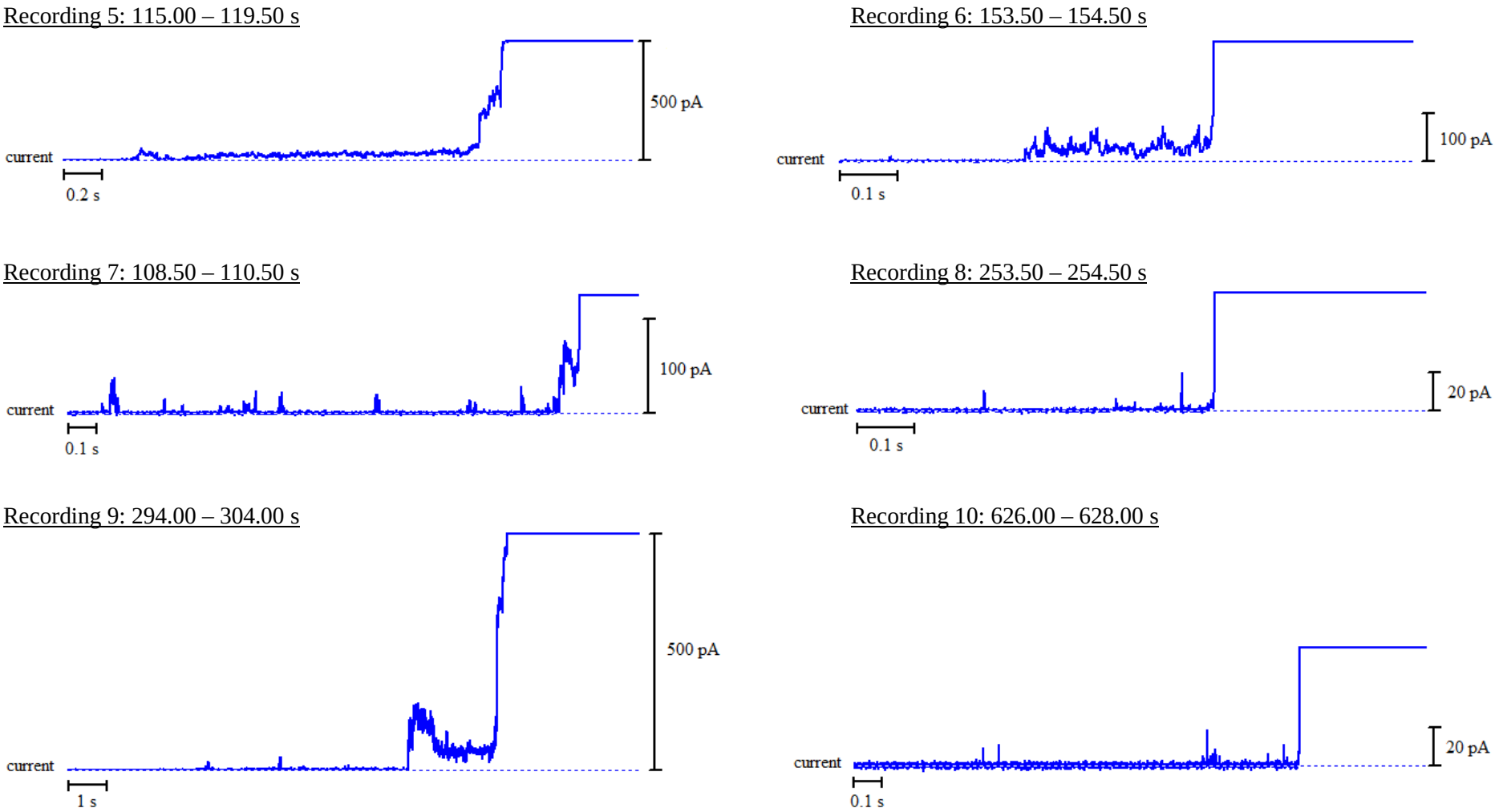
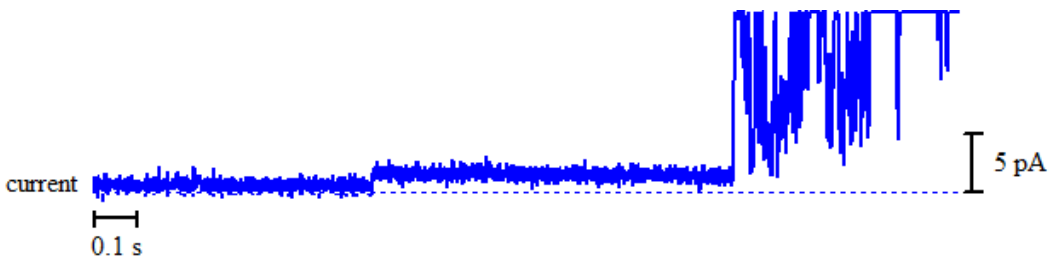


Figure A2 - 81: Bilayer activity of **10** with Na^+ ions upon the addition of 25µl (recordings 5, 6 and 7), 50µl (recording 8) and 75µl (recordings 9 and 10) stock solution of **10** in DMSO.

Planar phospholipid bilayer activity of 10 towards K^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 98.76 - 100.76 s



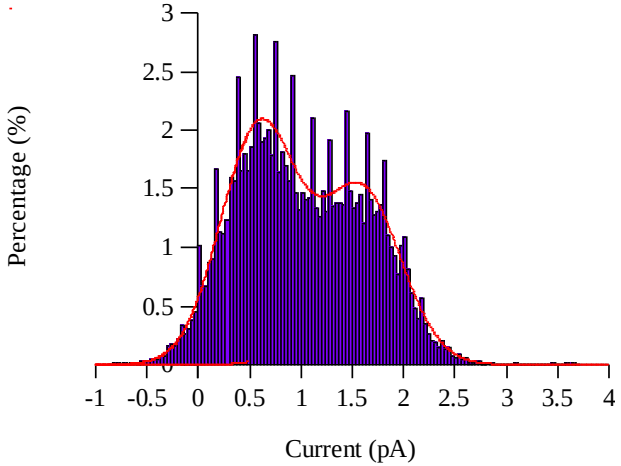


Figure A2 - 82: Above: bilayer activity of **10** with K^+ ions upon the addition of 25µl stock solution of **10** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.5903 ± 0.0295 pA and peak 2 = 1.584 ± 0.0417 pA.

Recording 2: 98.76 - 100.76 s

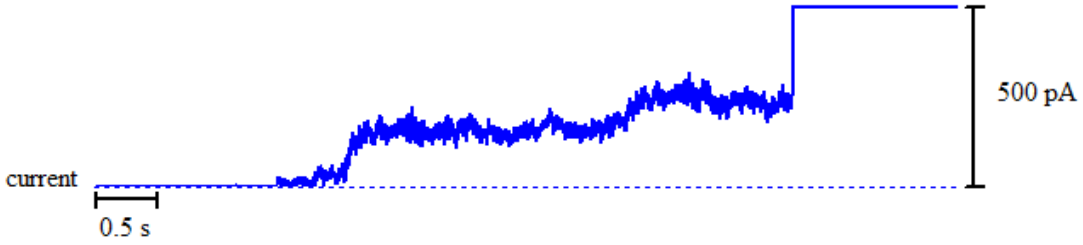


Figure A2 - 83: Bilayer activity of **10** with K^+ ions upon the addition of 25µl stock solution of **10** in DMSO.

Planar phospholipid bilayer activity of 11 towards Na^+ across the POPE and POPS bilayer system

Due to experimental limitations, the ion channel activity of **11** towards Na^+ was unable to be investigated across this bilayer system.

Planar phospholipid bilayer activity of 11 towards K^+ across the POPE and POPS bilayer system

Due to experimental limitations, the ion channel activity of **11** towards K^+ was unable to be investigated across this bilayer system.

Planar phospholipid bilayer activity of 11 towards Na^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 310.50 - 315.50 s

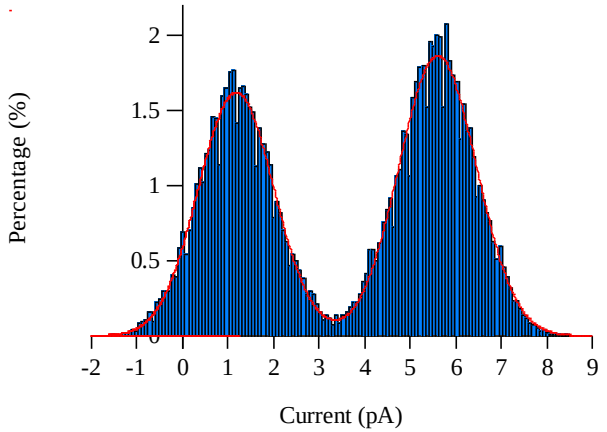


Figure A2 - 84: Above: bilayer activity of **11** with Na^+ ions upon the addition of 75µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.173 ± 0.0156 pA and peak 2 = 5.601 ± 0.0137 pA.

Recording 1: 617.50 - 622.50 s

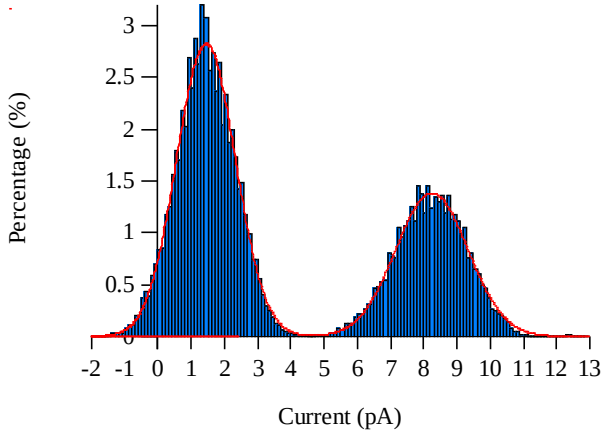


Figure A2 - 85: Above: bilayer activity of **11** with Na^+ ions upon the addition of 125µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.439 ± 0.0102 pA and peak 2 = 8.233 ± 0.0230 pA.

Recording 1: 705.00 – 755.00 s

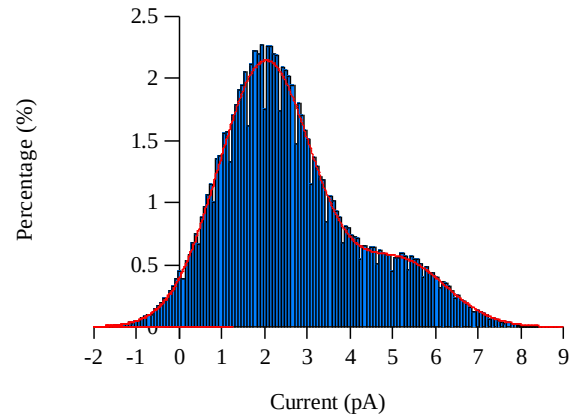
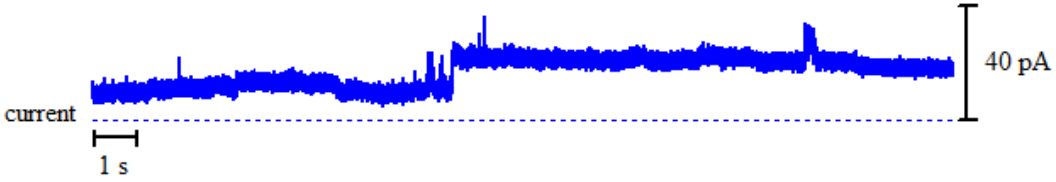


Figure A2 - 86: Above: bilayer activity of **11** with Na^+ ions upon the addition of 150µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 2.018 ± 0.0229 pA and peak 2 = 5.162 ± 0.0919 pA.

Recording 1: 938.50 - 956.50 s



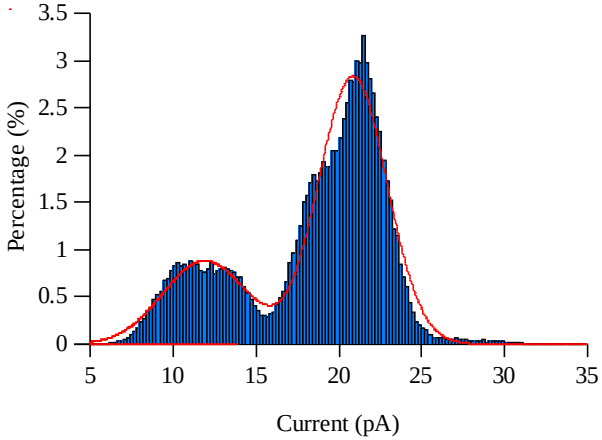
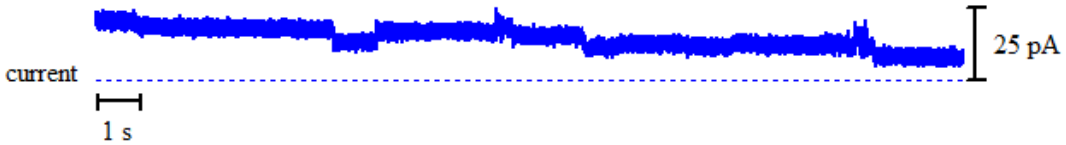


Figure A2 - 87: Above: bilayer activity of **11** with Na^+ ions upon the addition of 175µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 11.89 ± 0.1455 pA and peak 2 = 20.83 ± 0.0413 pA.

Recording 1: 951.80 - 975.80 s



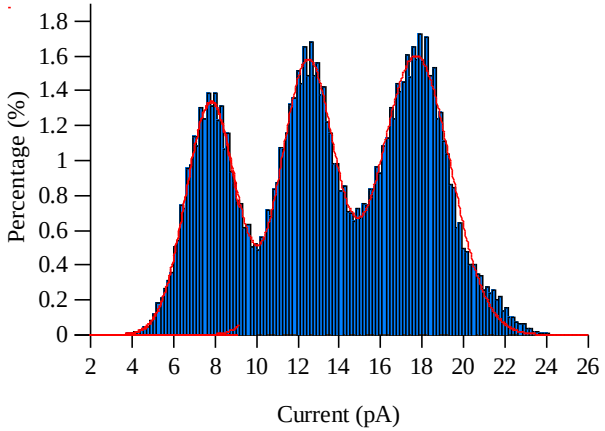
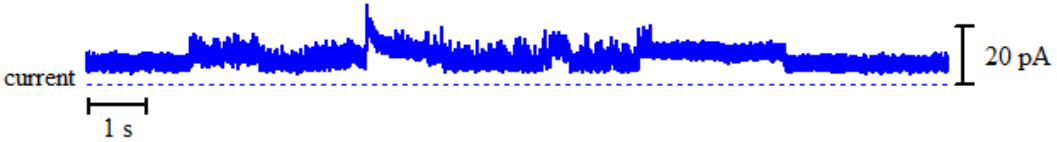


Figure A2 - 88: Above: bilayer activity of **11** with Na^+ ions upon the addition of 175µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 7.807 ± 0.0219 pA, peak 2 = 12.47 ± 0.0240 and peak 3 = 17.68 ± 0.0271 pA.

Recording 1: 1188.00s – 1205.00 s



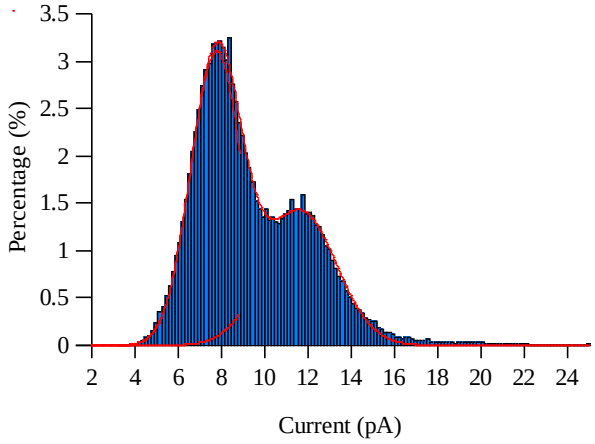


Figure A2 - 89: Above: bilayer activity of **11** with Na^+ ions upon the addition of 200µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 7.757 ± 0.0147 pA and peak 2 = 11.62 ± 0.0427 pA.

Recording 1: 1325.00 – 1344.00 s

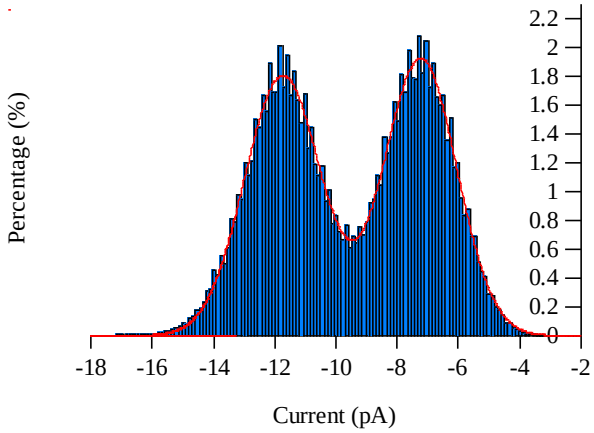


Figure A2 - 90: Above: bilayer activity of **11** with Na^+ ions upon the addition of 200µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = -11.75 ± 0.0183 pA and peak 2 = -7.244 ± 0.0168 pA.

Recording 2: 419.00 – 459.00 s

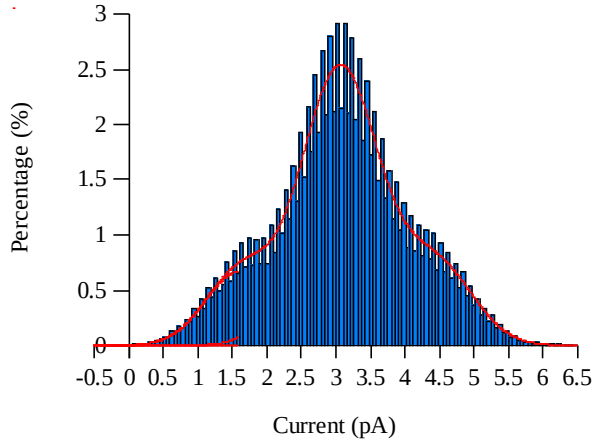


Figure A2 - 91: Above: bilayer activity of **11** with Na^+ ions upon the addition of 100µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.611 ± 0.0740 pA, peak 2 = 3.054 ± 0.0347 pA and peak 3 = 4.439 ± 0.2179 pA.

Recording 2: 493.00 –598.00 s

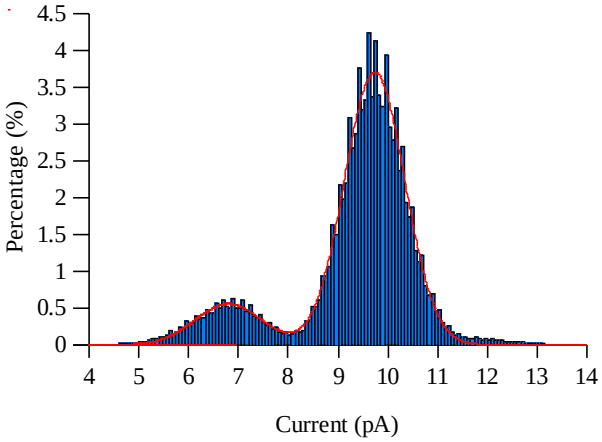
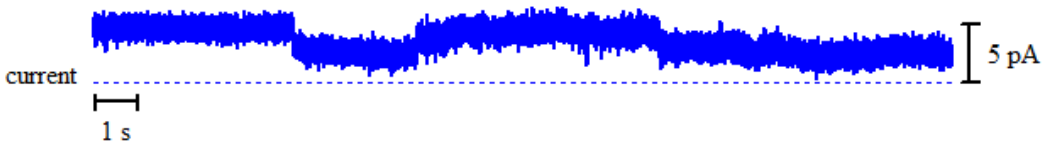


Figure A2 - 92: Above: bilayer activity of **11** with Na^+ ions upon the addition of 100µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 6.784 ± 0.0581 pA and peak 2 = 9.733 ± 0.0083 pA.

Recording 2: 1147.00 –1162.00 s



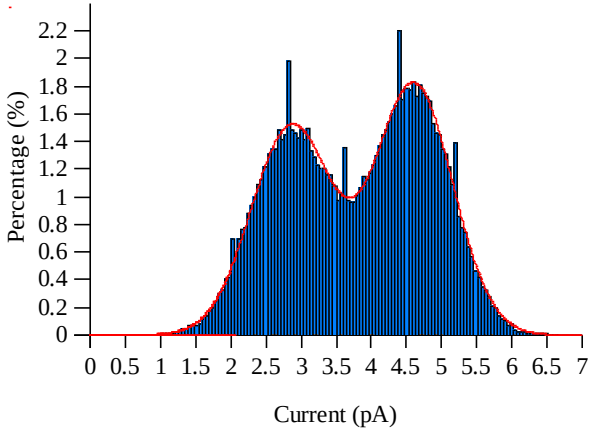


Figure A2 - 93: Above: bilayer activity of **11** with Na^+ ions upon the addition of 150µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 2.862 ± 0.0144 pA and peak 2 = 4.603 ± 0.0118 pA.

Recording 2: 1367.00 – 1377.00 s

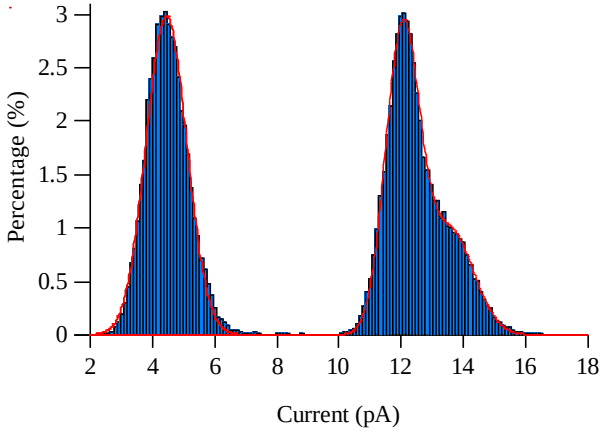
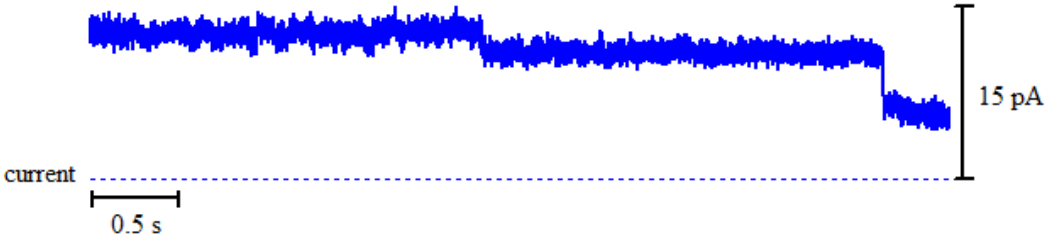


Figure A2 – 94: Above: bilayer activity of **11** with Na^+ ions upon the addition of 175µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 4.445 ± 0.0048 pA, peak 2 = 12.03 ± 0.0109 pA and peak 3 = 13.58 ± 0.0474 pA.

Recording 2: 1403.00 – 1407.00 s



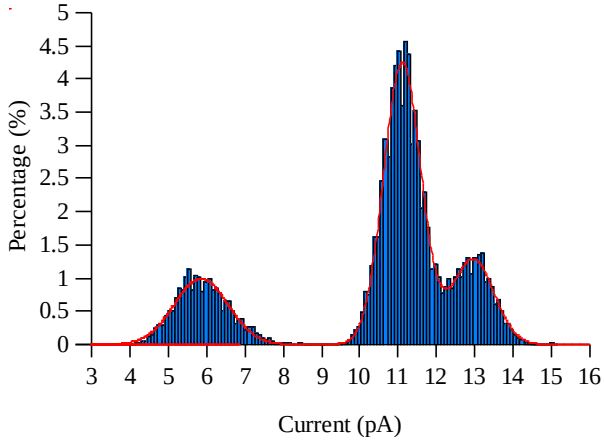


Figure A2 – 95: Above: bilayer activity of **11** with Na^+ ions upon the addition of 175µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 5.845 ± 0.0396 pA, peak 2 = 11.1 ± 0.0097 pA and peak 3 = 12.94 ± 0.0337 pA.

Recording 3: 752.00 – 772.00 s

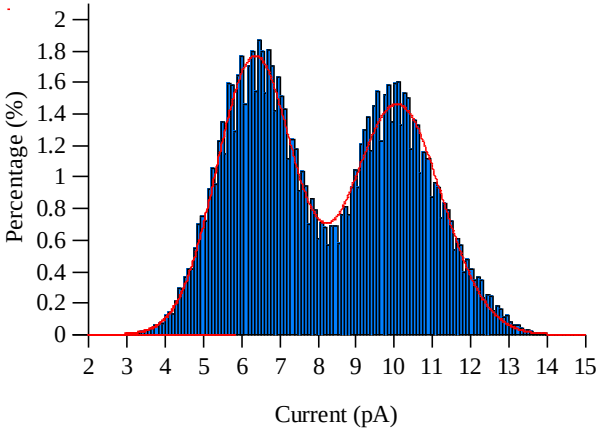


Figure A2 - 96: Above: bilayer activity of **11** with Na^+ ions upon the addition of 175µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 6.342 ± 0.0204 pA and peak 2 = 10.06 ± 0.0265 pA.

Recording 3: 1210.00 – 1320.00 s

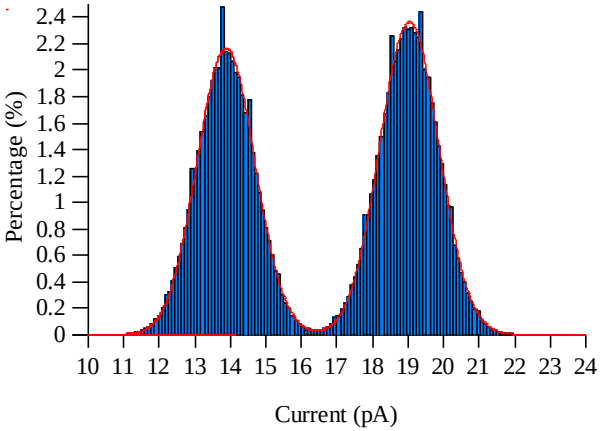
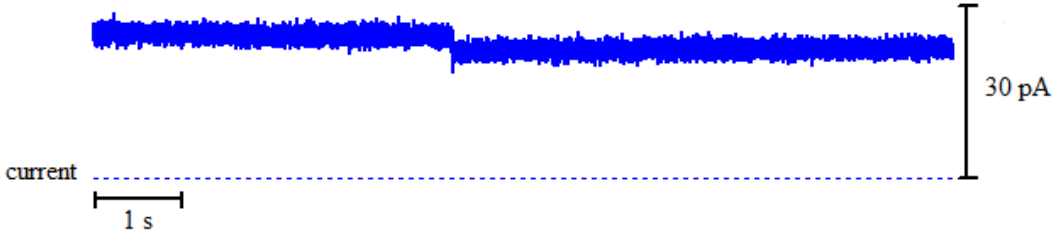


Figure A2 - 97: Above: bilayer activity of **11** with Na^+ ions upon the addition of 200µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 13.87 ± 0.0077 pA and peak 2 = 19.03 ± 0.0071 pA.

Recording 3: 1530.00 – 1542.00 s



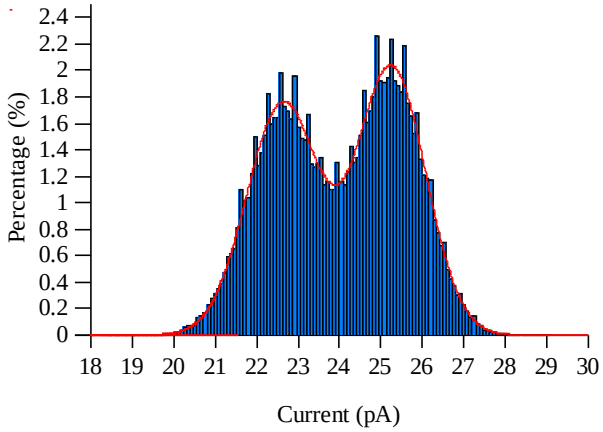


Figure A2 - 98: Above: bilayer activity of **11** with Na^+ ions upon the addition of 200µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 22.62 ± 0.0231 pA and peak 2 = 25.24 ± 0.0195 pA.

Recording 3: 1692.00 - 1702.00 s

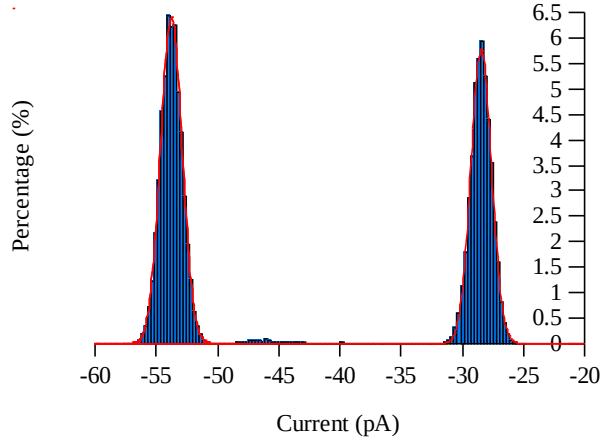


Figure A2 - 99: Above: bilayer activity of **11** with Na^+ ions upon the addition of 200µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = -53.77 ± 0.0061 pA and peak 2 = -28.45 ± 0.0066 pA.

Recording 3: 1749.50 – 1756.50 s

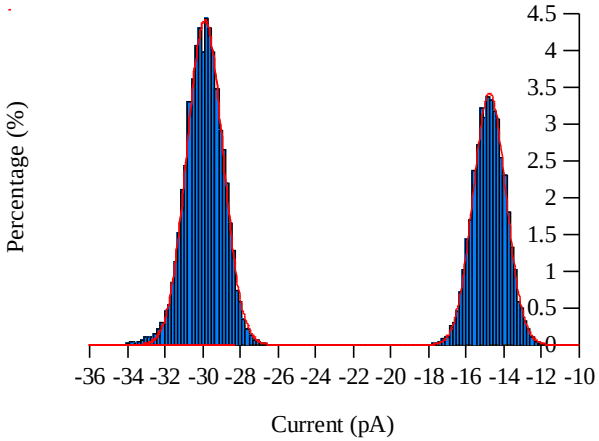
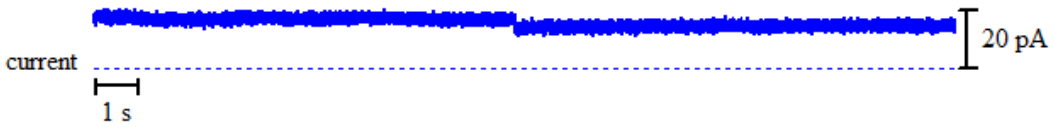


Figure A2 - 100: Above: bilayer activity of **11** with Na^+ ions upon the addition of 200µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = -29.88 ± 0.0068 pA and peak 2 = -14.77 ± 0.0085 pA.

Recording 3: 1810.00 – 1860.00 s



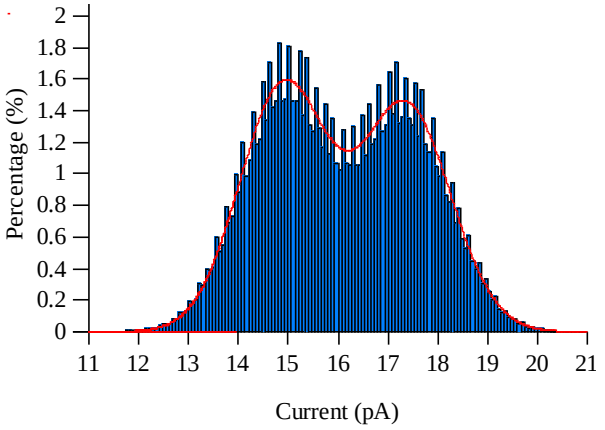
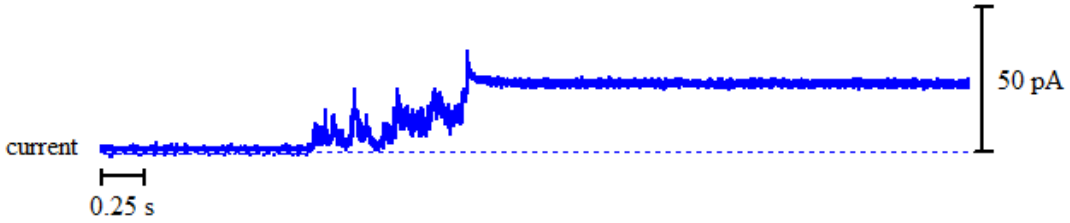


Figure A2 - 101: Above: bilayer activity of **11** with Na^+ ions upon the addition of 200µl stock solution of **11** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 14.9 ± 0.0347 pA and peak 2 = 17.36 ± 0.0387 pA.

Planar phospholipid bilayer activity of 11 towards K^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 216.00 – 226.00 s



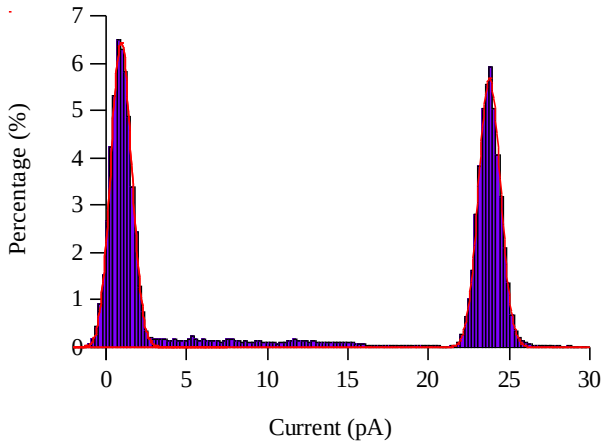
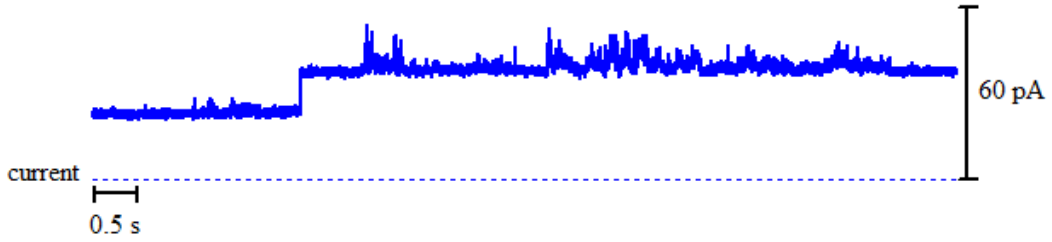


Figure A2 - 102: Above: bilayer activity of 11 with K^+ ions upon the addition of 75µl stock solution of 11 in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.923 ± 0.0067 pA and peak 2 = 23.77 ± 0.0077 pA.

Recording 2: 481.00 – 491.00 s



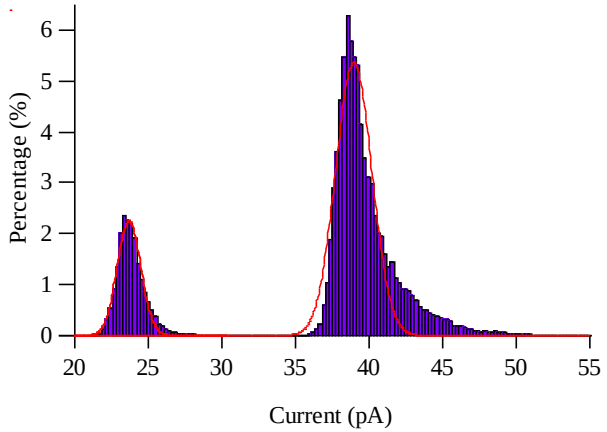
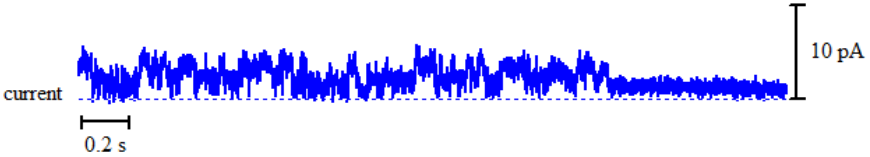


Figure A2 - 103: Above: bilayer activity of 11 with K^+ ions upon the addition of 75µl stock solution of 11 in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 23.86 ± 0.0798 pA and peak 2 = 38.95 ± 0.0397 pA.

Recording 3: 959.00 – 969.00 s

Recording 3: 1006.10 – 1058.60 s

Recording 3: 1056.60 – 1058.60 s



Recording 4: 796.6 – 801.6 s

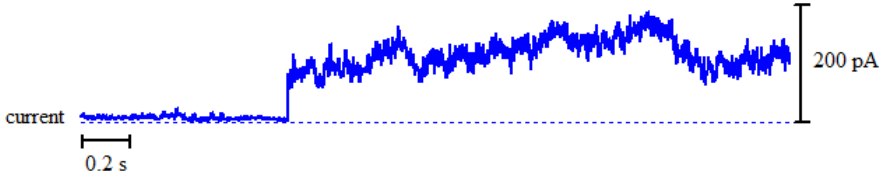
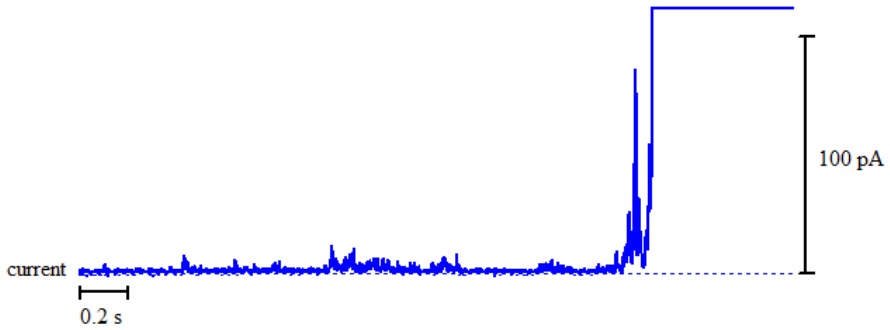
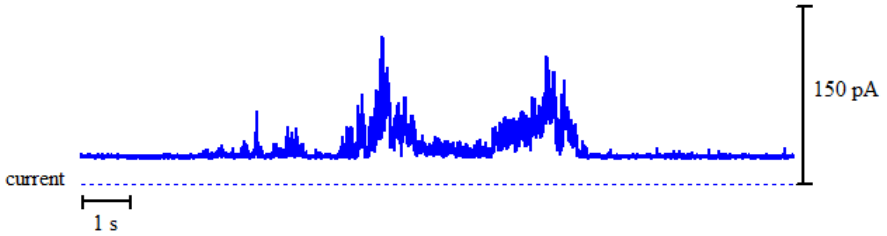


Figure A2 - 104: Bilayer activity of **11** with K^+ ions upon the addition of 200µl (recordings 3) and 150µl (recording 4) stock solution of **11** in DMSO.

Recording 5: 150.00 – 155.00 s



Recording 6: 432.00 – 452.00 s



Recording 7: 591.00 – 606.00 s

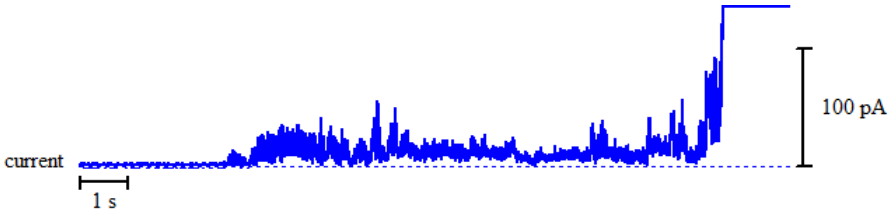
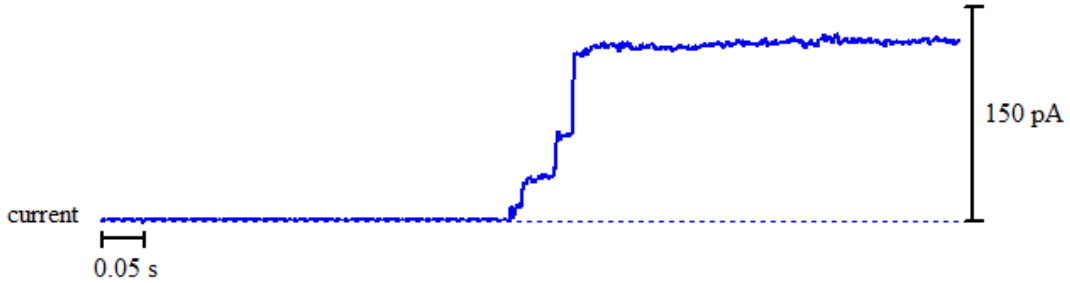


Figure A2 - 105: Bilayer activity of **11** with K^+ ions upon the addition of 25µl (recording 5), 75µl (recording 6) and 100µl (recording 7) stock solution of **11** in DMSO.

Planar phospholipid bilayer activity of 12 towards Na^+ across the POPE and POPS bilayer system

Recording 1: 258.00 – 259.00 s



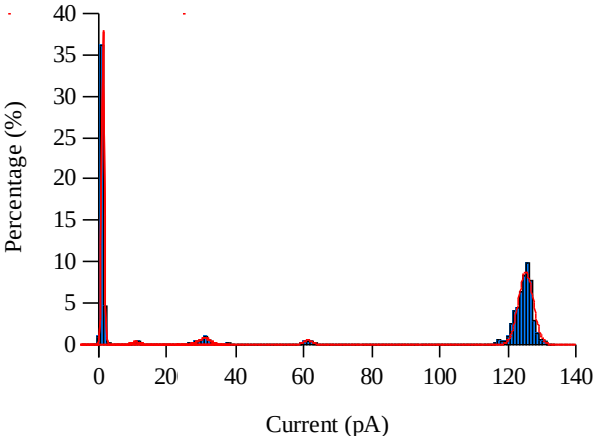
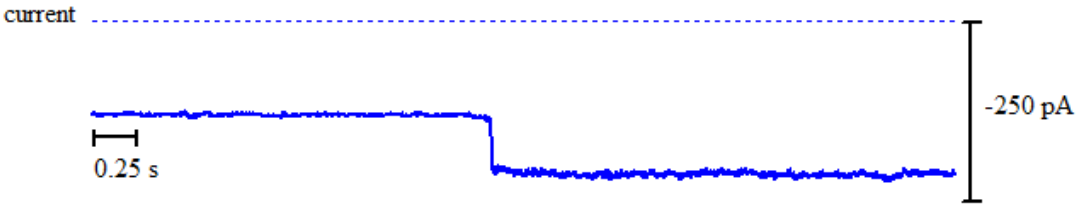


Figure A2 - 106: Above: bilayer activity of **12** with Na^+ ions upon the addition of 100µl stock solution of **12** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.414 ± 0.0025 pA, peak 2 = 10.92 ± 0.2131 pA, peak 3 = 30.73 ± 0.6173 pA, peak 4 = 61.16 ± 0.9055 pA and peak 5 = 125.2 ± 0.0628 pA.

Recording 1: 273.00 – 277.00 s



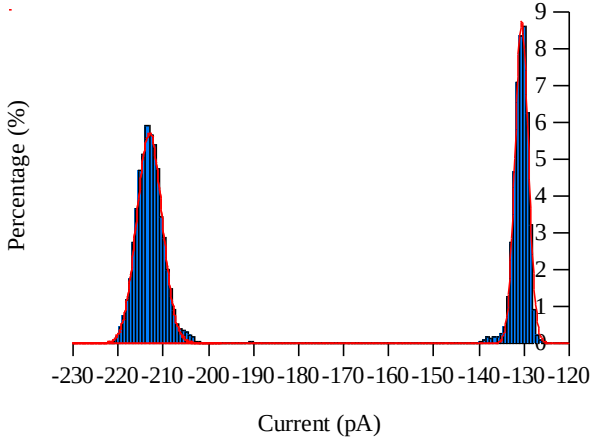


Figure A2 - 107: Above: bilayer activity of **12** with Na^+ ions upon the addition of 100µl stock solution of **12** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = -213.1 ± 0.0399 pA and peak 2 = -130.5 ± 0.0250 pA.

Recording 1: 238.00 – 244.00 s

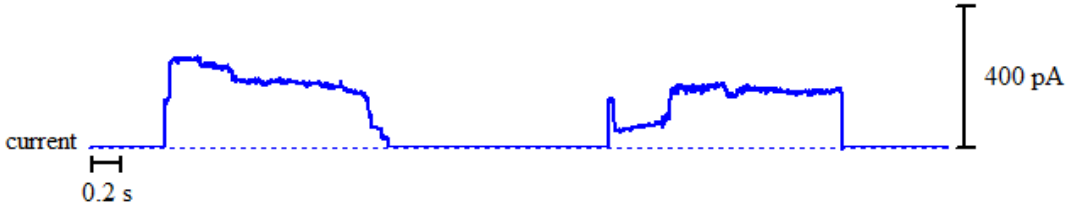
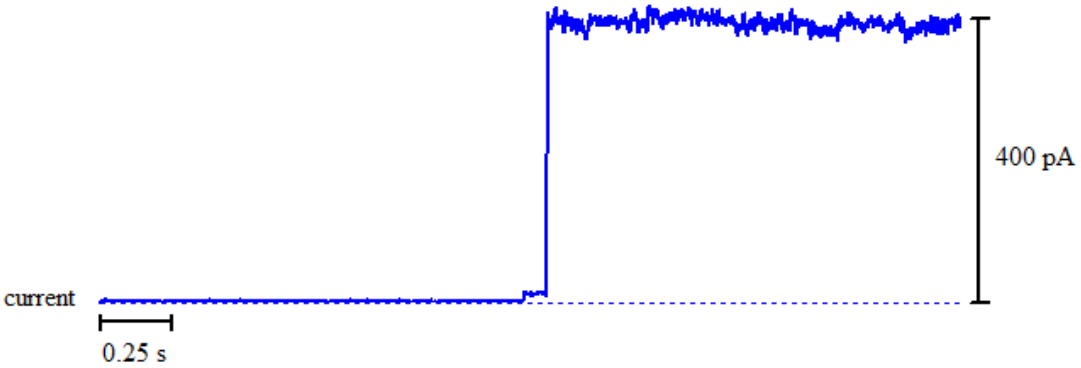


Figure A2 - 108: Bilayer activity of **12** with Na^+ ions upon the addition of 100µl stock solution of **12** in DMSO.

Recording 2: 232.00 – 234.00 s



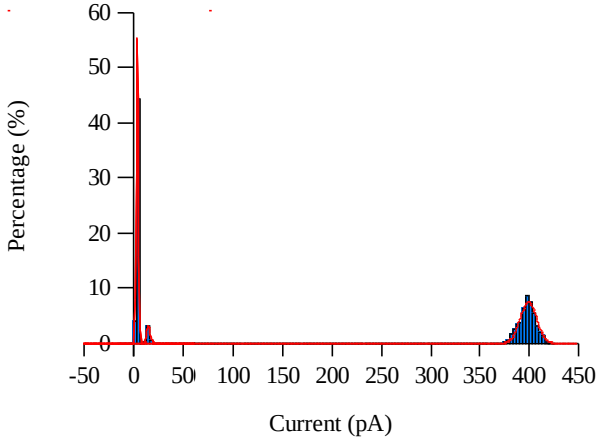


Figure A2 - 109: Above: bilayer activity of **12** with Na^+ ions upon the addition of 100µl stock solution of **12** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 4.207 ± 0.1242 pA, peak 2 = 15.17 ± 0.2261 pA and peak 3 = 398.7 ± 0.1815 pA.

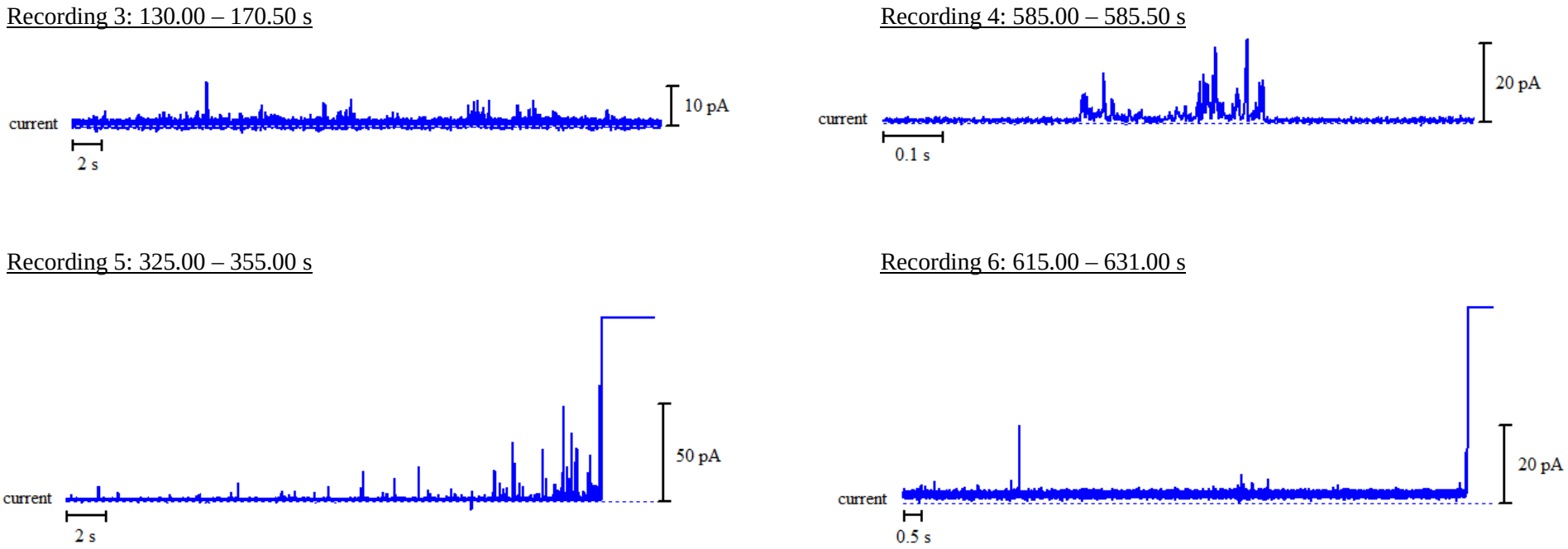


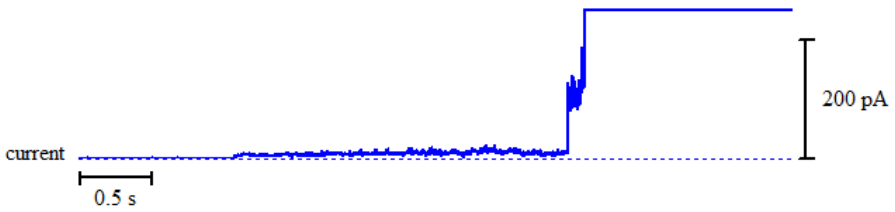
Figure A2 - 110: Bilayer activity of **12** with Na^+ ions upon the addition of 50µl (recording 3), 125µl (recordings 4 and 5) and 150µl (recording 6) stock solution of **12** in DMSO.

Planar phospholipid bilayer activity of 12 towards K^+ across the POPE and POPS bilayer system

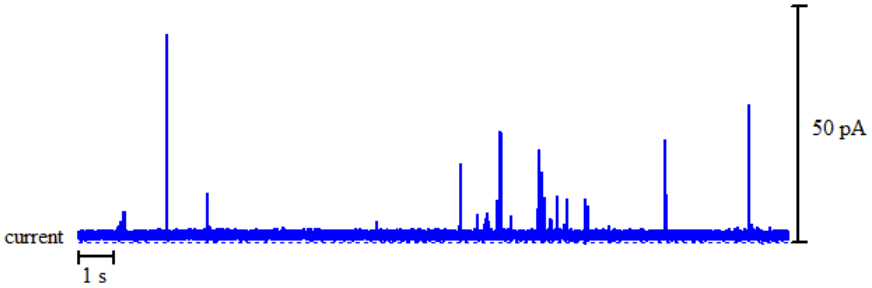
Due to experimental limitations, the ion channel activity of **12** towards K^+ was unable to be investigated across this bilayer system.

Planar phospholipid bilayer activity of 12 towards Na^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 99.00 – 103.00 s



Recording 2: 751.50 – 766.50 s



Recording 2: 993.00 – 998.00 s

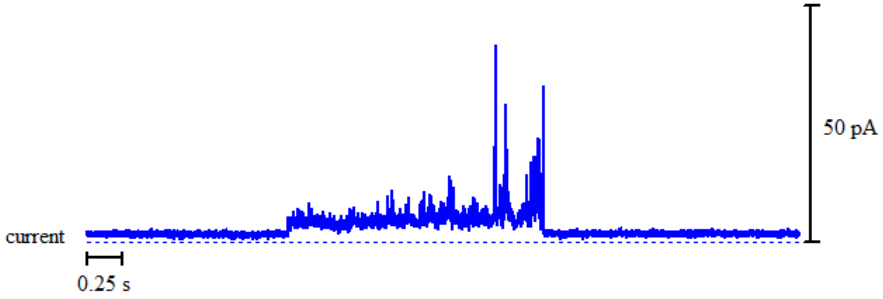
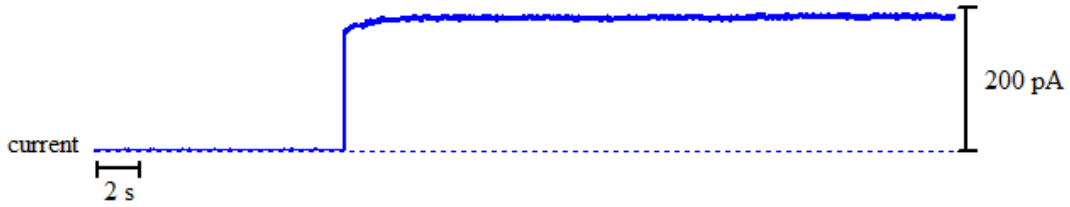


Figure A2 - 111: Bilayer activity of **12** with Na^+ ions upon the addition of 25µl (recording 1) and 200µl (recordings 2) stock solution of **12** in DMSO.

Planar phospholipid bilayer activity of 12 towards K^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 258.00 – 259.00 s



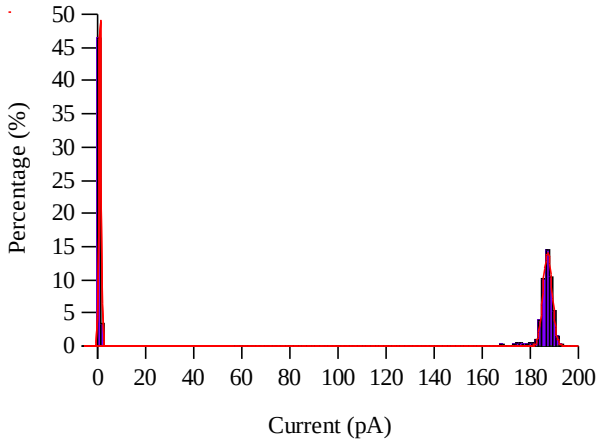


Figure A2 - 112: Above: bilayer activity of **12** with K^+ ions upon the addition of 50µl stock solution of **12** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.391± 0.0102 pA and peak 2 = 187.2 ± 0.0183 pA.

Recording 1: 298.00 – 318.00 s

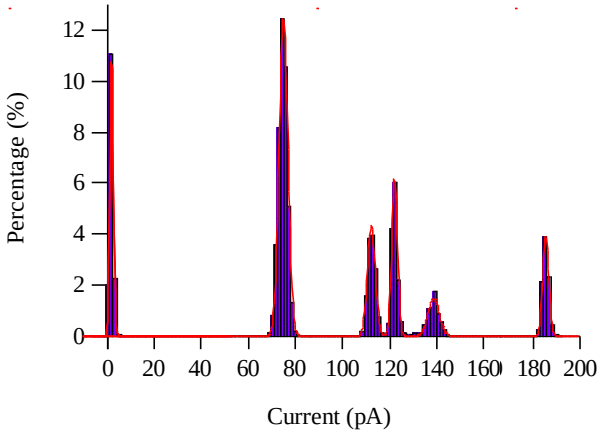
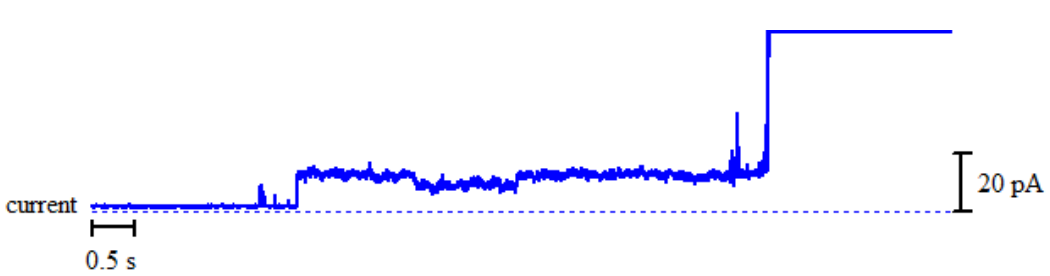


Figure A2 - 113: Above: bilayer activity of **12** with K^+ ions upon the addition of 50µl stock solution of **12** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.928 ± 0.0064 pA, peak 2 = 74.98 ± 0.0069 pA, peak 3 = 112.1 ± 0.0608 pA, peak 4 = 122 ± 0.0469 pA, peak 5 = 138.5 ± 0.2227 pA and peak 6 = 185.4 ± 0.0142 pA.

Recording 2: 320.00 – 335.00 s



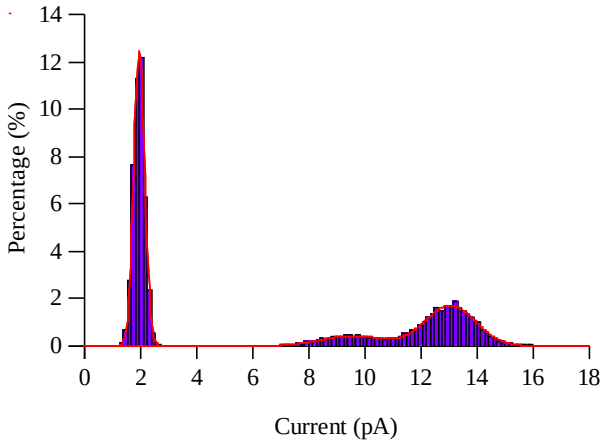


Figure A2 - 114: Above: bilayer activity of **12** with K^+ ions upon the addition of 75µl stock solution of **12** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.951 ± 0.0017 pA, peak 2 = 9.542 ± 0.1378 pA and peak 3 = 13.04 ± 0.0312 pA.

Recording 3: 294.00 – 299.00 s

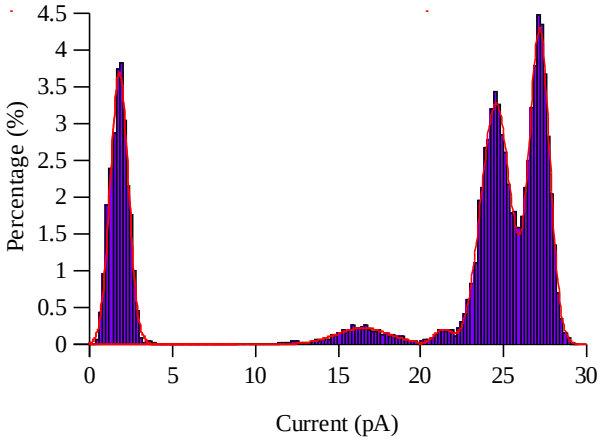
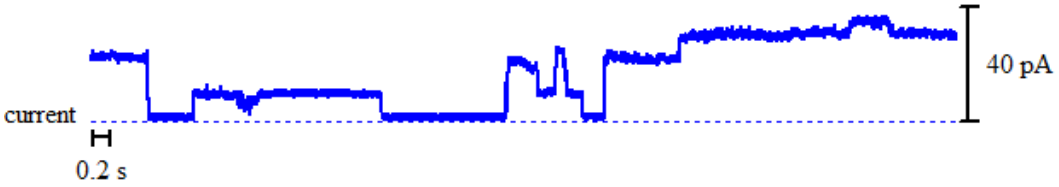


Figure A2 - 115: Above: bilayer activity of **12** with K^+ ions upon the addition of 50µl stock solution of **12** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.795 ± 0.0063 pA, peak 2 = 16.48 ± 0.1803 pA, peak 3 = 21.31 ± 0.1363 pA, peak 4 = 24.52 ± 0.0203 pA and peak 5 = 27.17 ± 0.0140 pA.

Recording 3: 306.00 – 316.00 s



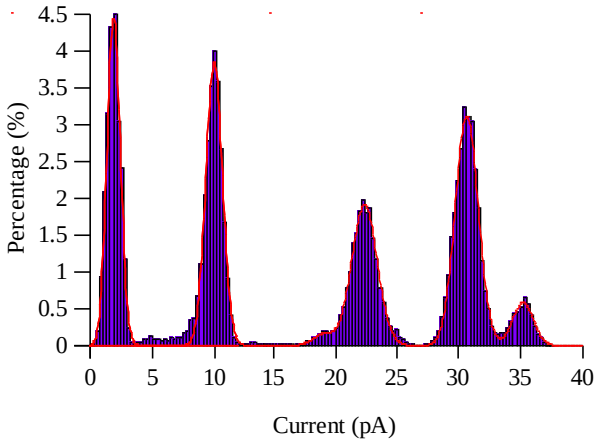
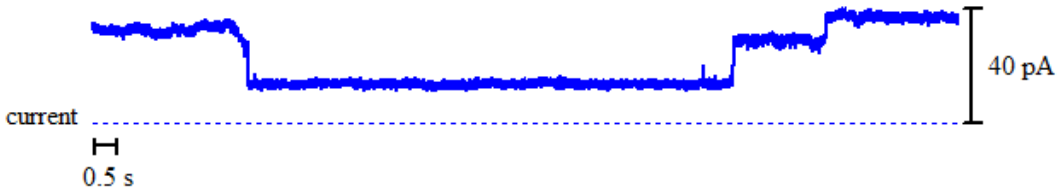


Figure A2 - 116: Above: bilayer activity of **12** with K^+ ions upon the addition of 50µl stock solution of **12** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.886 ± 0.0109 pA, peak 2 = 9.962 ± 0.0139 pA, peak 3 = 19.06 ± 0.2169 pA, peak 4 = 22.33 ± 0.0192 pA, peak 5 = 30.66 ± 0.0151 pA and peak 6 = 35.16 ± 0.0774 pA.

Recording 3: 315.50 - 340.50 s



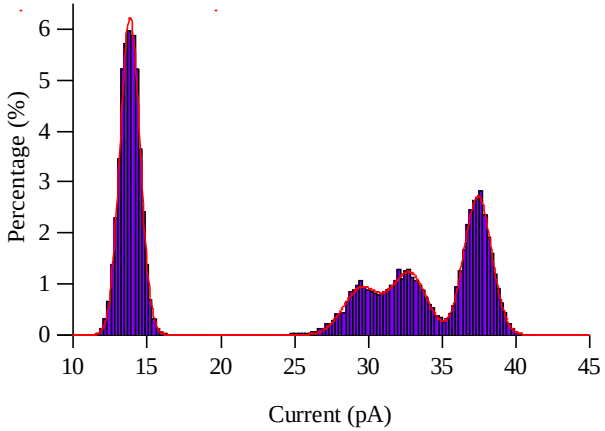
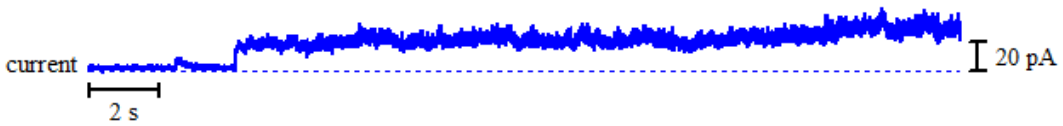


Figure A2 - 117: Above: bilayer activity of **12** with K^+ ions upon the addition of 50µl stock solution of **12** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 13.86 ± 0.0052 pA, peak 2 = 29.47 ± 0.0388 pA, peak 3 = 32.72 ± 0.0304 pA and peak 4 = 37.4 ± 0.0124 pA.

Recording 4: 674.00 – 699.00 s



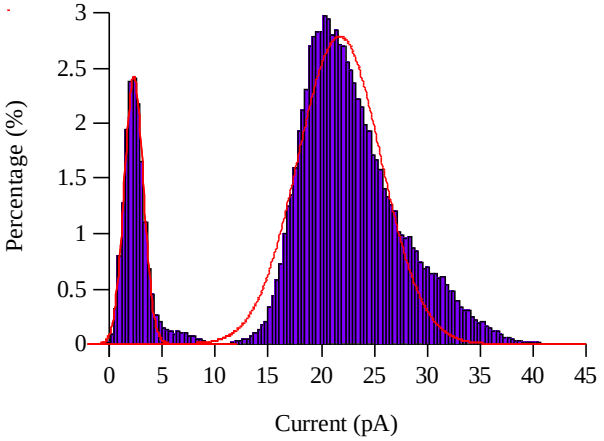
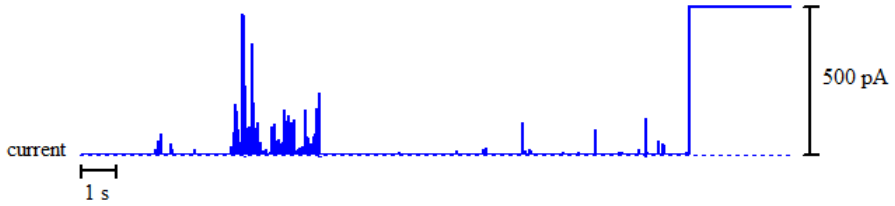


Figure A2 - 118: Above: bilayer activity of **12** with K^+ ions upon the addition of 150µl stock solution of **12** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 2.284 ± 0.0599 pA and peak 2 = 21.7 ± 0.1054 pA.

Recording 5: 129.00 – 146.00 s



Recording 6: 460.00 – 560.00 s

Figure A2 - 119: Bilayer activity of **12** with K^+ ions upon the addition of 25µl (recording 5) and 50µl (recording 6) stock solution of **12** in DMSO.

Planar phospholipid bilayer activity of 13 towards Na^+ across the POPE and POPS bilayer system

Due to experimental limitations, the ion channel activity of **13** towards Na^+ was unable to be investigated across this bilayer system.

Planar phospholipid bilayer activity of 13 towards K^+ across the POPE and POPS bilayer system

Due to experimental limitations, the ion channel activity of **13** towards K^+ was unable to be investigated across this bilayer system.

Planar phospholipid bilayer activity of 13 towards Na^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 180.00 – 220.00 s

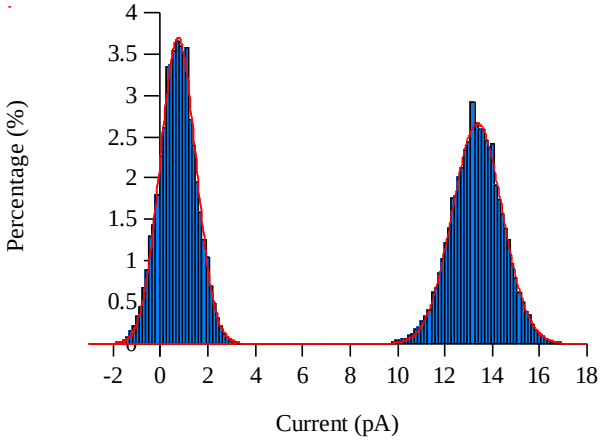
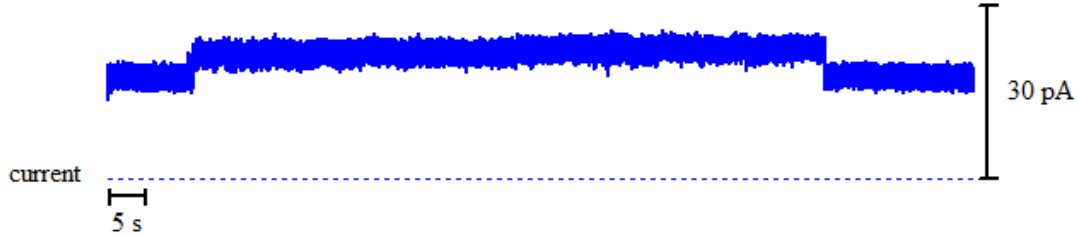


Figure A2 - 120: Above: bilayer activity of **13** with Na^+ ions upon the addition of 25µl stock solution of **13** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.7334 ± 0.0059 pA and peak 2 = 13.37 ± 0.0096 pA.

Recording 1: 235.00 – 335.00 s



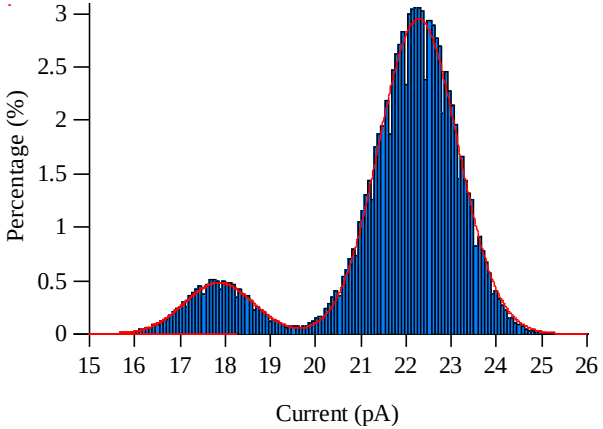


Figure A2 - 121: Above: bilayer activity of **13** with Na^+ ions upon the addition of 50µl stock solution of **13** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 17.85 ± 0.0514 pA and peak 2 = 22.27 ± 0.0089 pA.

Recording 2: 335.00 – 385.00 s

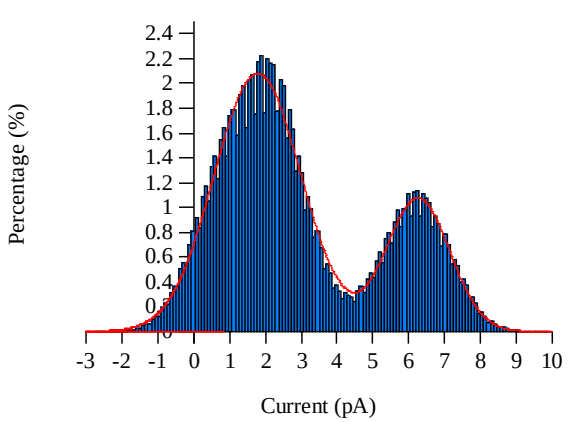


Figure A2 - 122: Above: bilayer activity of **13** with Na^+ ions upon the addition of 75µl stock solution of **13** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.776 ± 0.0160 pA and peak 2 = 6.249 ± 0.0267 pA.

Recording 2: 699.62 – 714.22 s

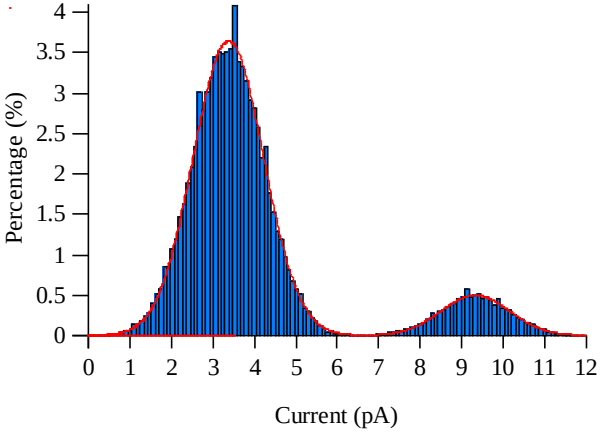


Figure A2 - 123: Above: bilayer activity of **13** with Na^+ ions upon the addition of 100µl stock solution of **13** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 3.37 ± 0.0059 pA and peak 2 = 9.311 ± 0.0427 pA.

Recording 3: 1073.80 - 1074.80 s

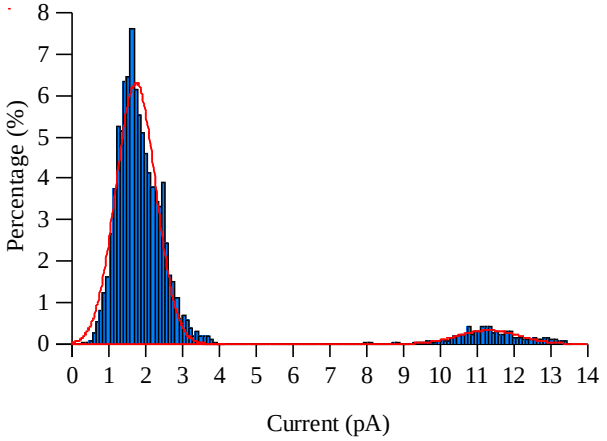


Figure A2 - 124: Above: bilayer activity of **13** with Na^+ ions upon the addition of 200µl stock solution of **13** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.729 ± 0.0118 pA and peak 2 = 11.3 ± 0.2743 pA.

Recording 3: 1114.50 - 1119.50 s

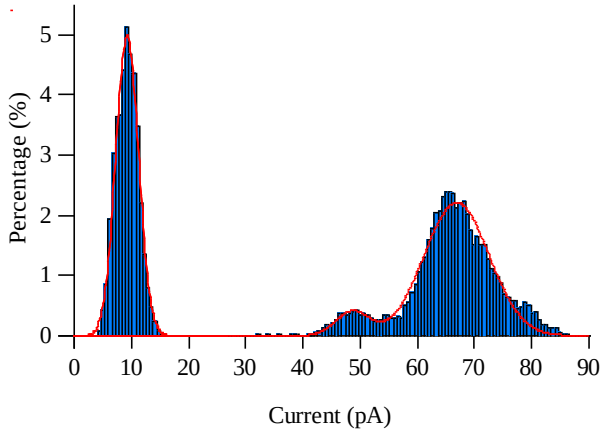


Figure A2 - 125: Above: bilayer activity of **13** with Na^+ ions upon the addition of 200µl stock solution of **13** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 9.247 ± 0.0034 pA, peak 2 = 48.57 ± 0.5281 pA and peak 3 = 66.81 ± 0.1317 pA.

Planar phospholipid bilayer activity of 13 towards K^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 870.00 – 880.00 s

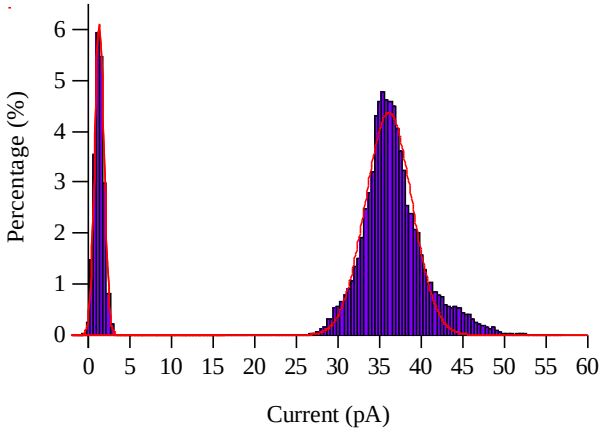
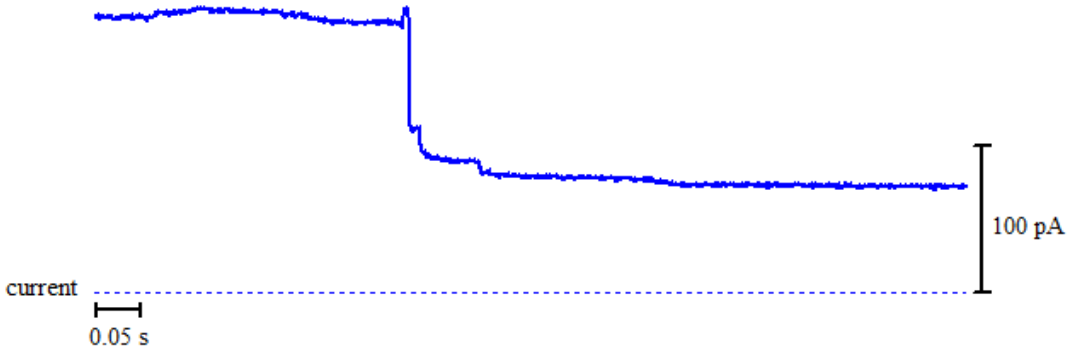


Figure A2 - 126: Above: bilayer activity of **13** with K^+ ions upon the addition of 200µl stock solution of **13** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.249 ± 0.0195 pA and peak 2 = 36.04 ± 0.0498 pA.

Recording 2: 301.05 - 303.05 s



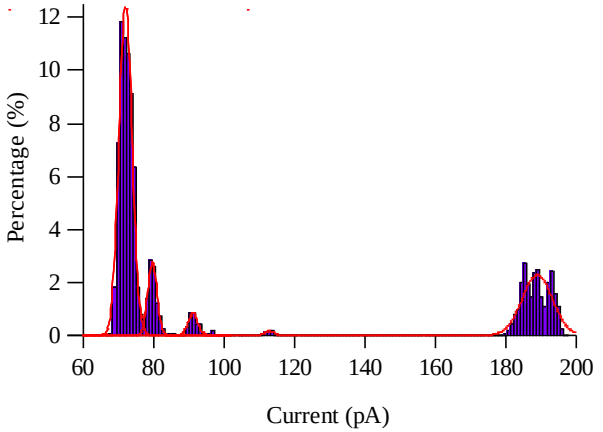
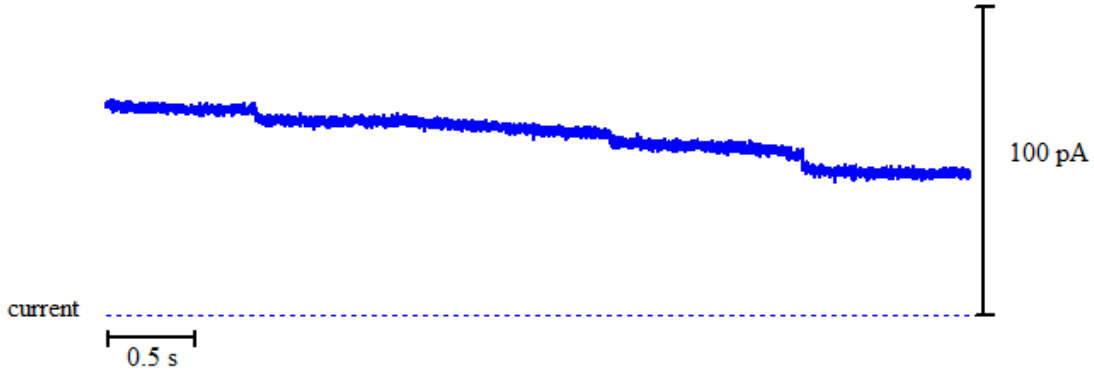


Figure A2 - 127: Above: bilayer activity of **13** with K^+ ions upon the addition of 50µl stock solution of **13** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 71.97 ± 0.0730 pA, peak 2 = 79.57 ± 0.3280 pA, peak 3 = 91.07 ± 1.0300 pA, peak 4 = 112.7 ± 2.7020 pA and peak 5 = 188.8 ± 0.2301 pA.

Recording 2: 304.00 - 309.00 s



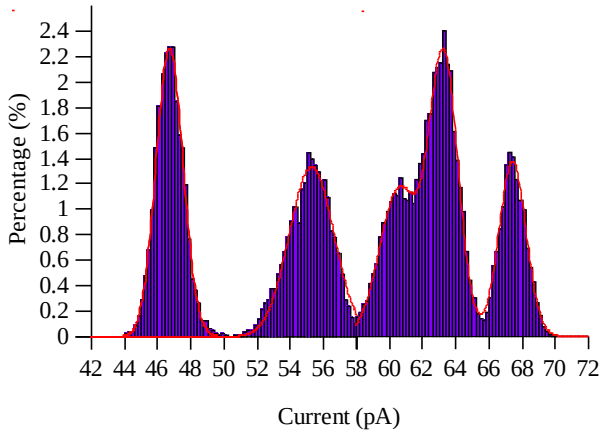


Figure A2 - 128: Above: bilayer activity of **13** with K^+ ions upon the addition of 50µl stock solution of **13** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 46.7 ± 0.0149 pA, peak 2 = 55.26 ± 0.0307 pA, peak 3 = 60.58 ± 0.0380 pA, peak 4 = 63.27 ± 0.0184 pA and peak 5 = 67.42 ± 0.0287 pA.

Recording 3: 334.00 – 360.00 s

Recording 3: 915.00 – 965.00 s

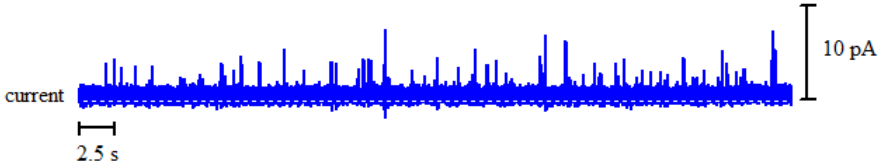
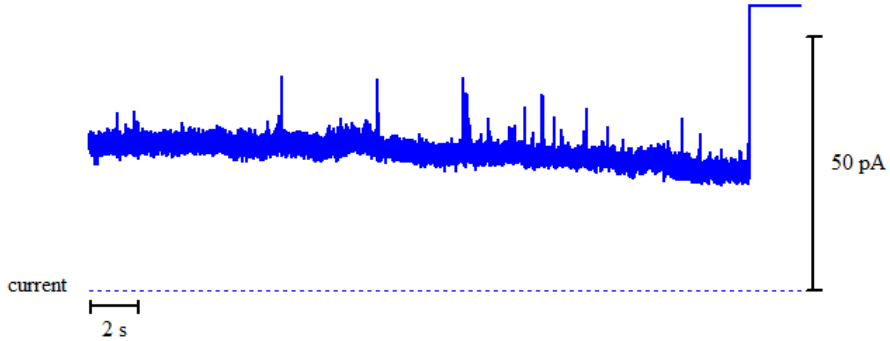
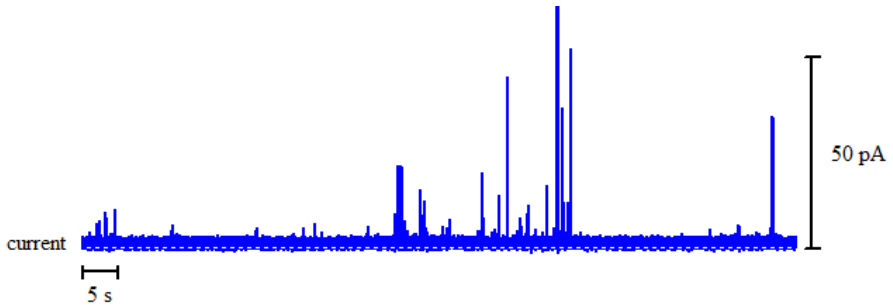


Figure A2 - 129: Bilayer activity of **13** with K^+ ions upon the addition of 50µl (recording 3- left) and 225µl (recording 3- right) stock solution of **13** in DMSO.

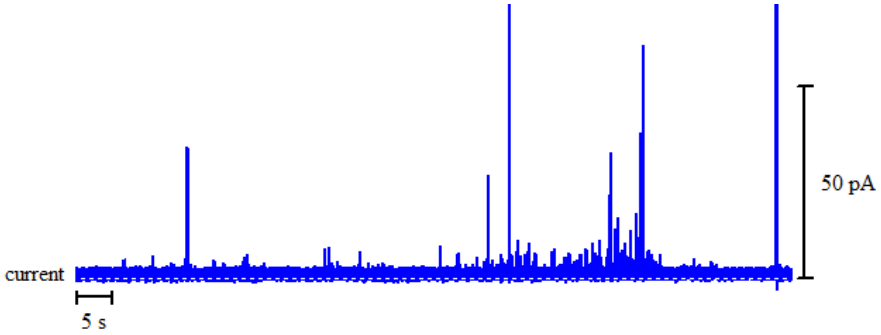
Recording 4: 350.00 – 380.00 s



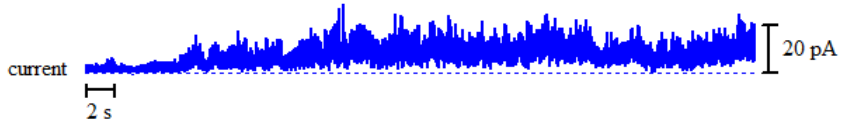
Recording 4: 600.00 – 700.00 s



Recording 4: 700.00 – 780.00 s



Recording 5: 950.00 – 1000.00 s



Recording 5: 1350.00 – 1400.00 s

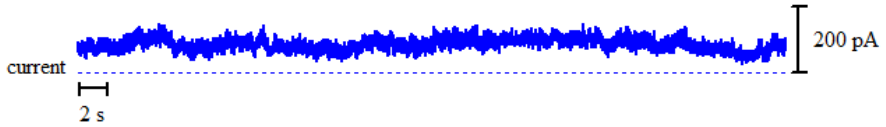
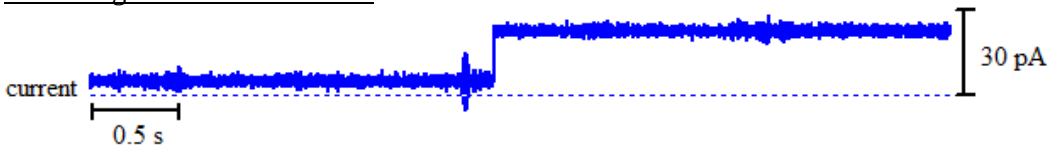


Figure A2 - 130: Bilayer activity of **13** with K^+ ions upon the addition of 150ul (recordings 4) and 175µl and 200µl (recordings 5) stock solution of **13** in DMSO.

Planar phospholipid bilayer activity of 14 towards Na^+ across the POPE and POPS bilayer system

Recording 1: 203.00 – 233.00 s



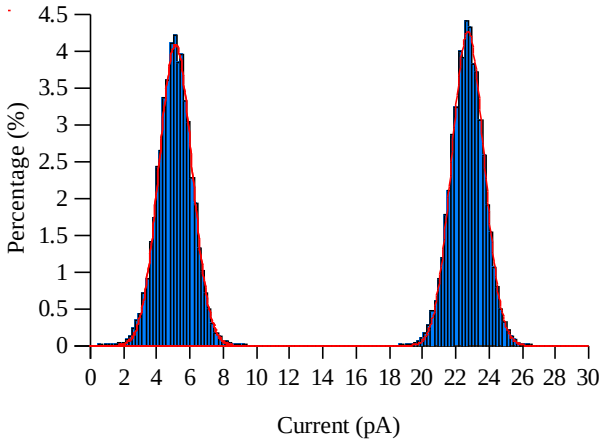
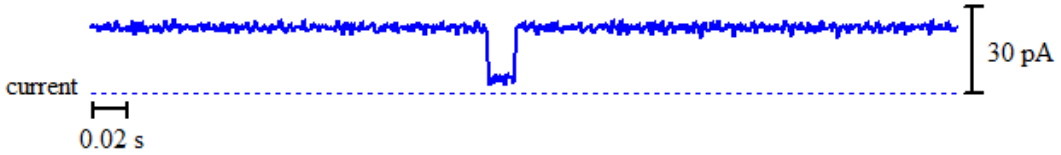


Figure A2 - 131: Above: bilayer activity of **14** with Na^+ ions upon the addition of 50µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 5.113 ± 0.0071 pA and peak 2 = 22.72 ± 0.0068 pA.

Recording 1: 236.20 – 237.20 s



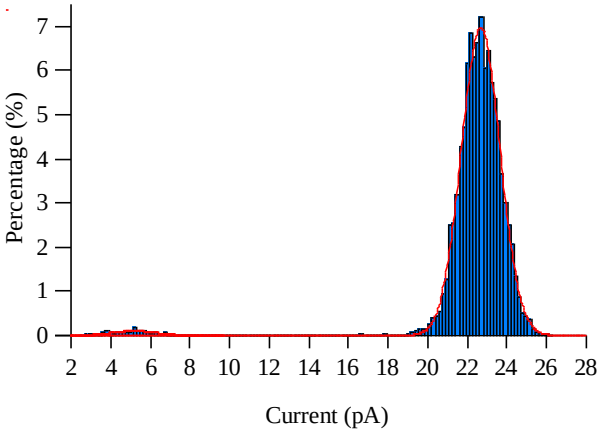
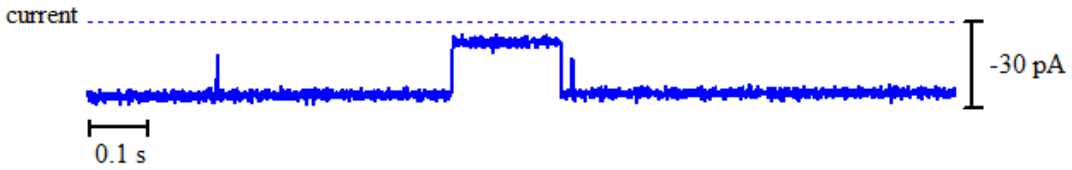


Figure A2 - 132: Above: bilayer activity of **14** with Na^+ ions upon the addition of 50µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 5.152 ± 0.6698 pA and peak 2 = 22.66 ± 0.0085 pA.

Recording 1: 236.20 – 237.20 s



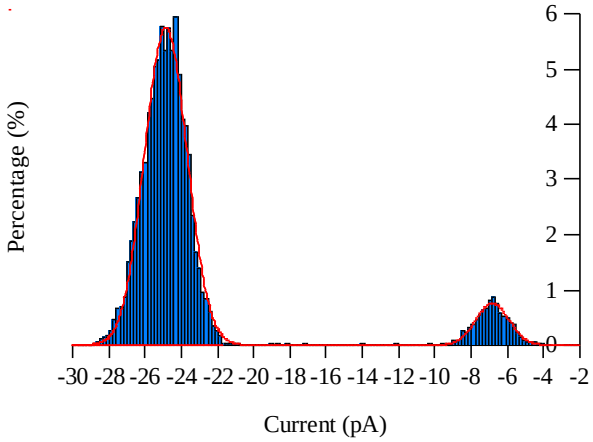
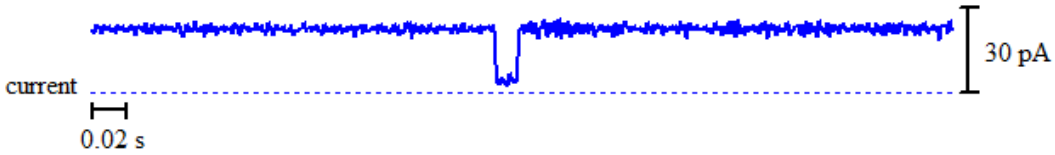


Figure A2 - 133: Above: bilayer activity of **14** with Na^+ ions upon the addition of 50µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = -24.86 ± 0.0110 pA and peak 2 = -6.856 ± 0.0760 pA.

Recording 1: 323.50 - 324.00 s



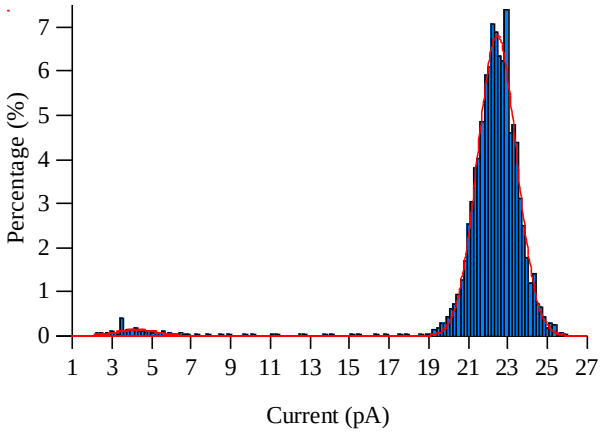
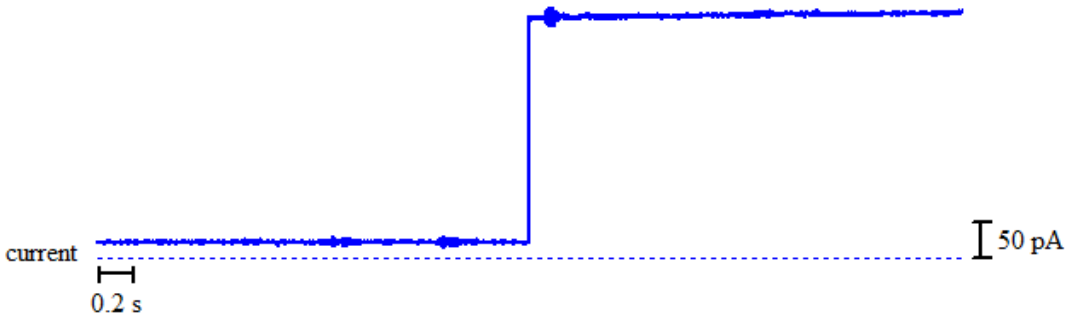


Figure A2 - 134: Above: bilayer activity of **14** with Na^+ ions upon the addition of 75µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 4.223 ± 1.13 pA and peak 2 = 22.44 ± 0.0115 pA.

Recording 1: 401.50 - 411.50 s



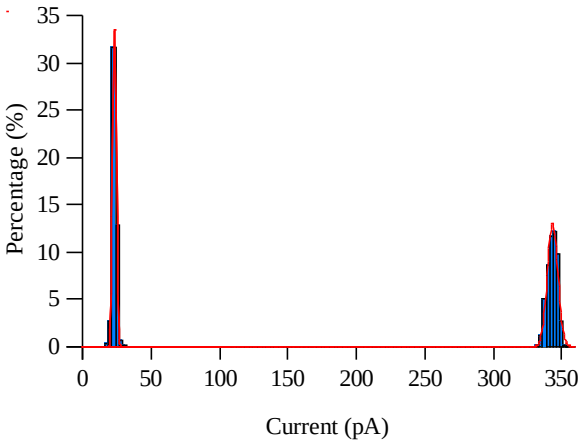
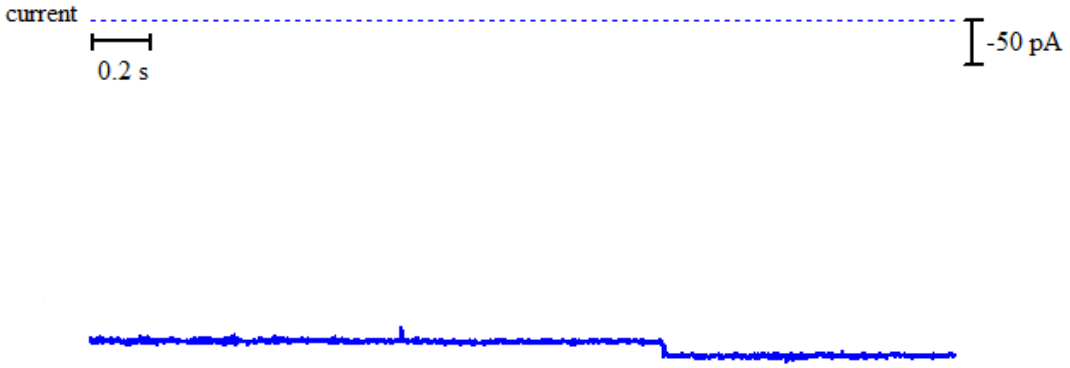


Figure A2 - 135: Above: bilayer activity of **14** with Na^+ ions upon the addition of 100µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 23.39 ± 0.0305 pA and peak 2 = 343.1 ± 0.0665 pA.

Recording 1: 417.00 – 420.00 s



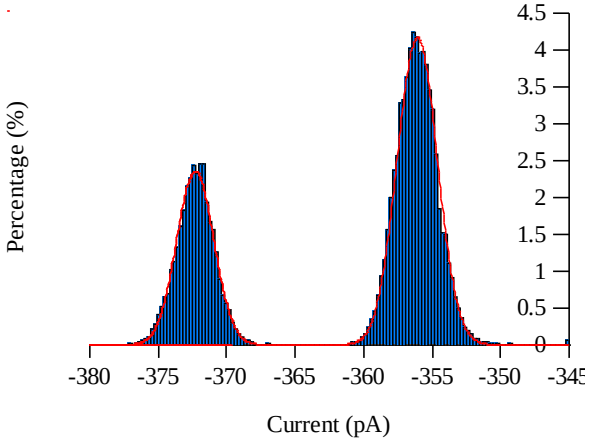


Figure A2 - 136: Above: bilayer activity of **14** with Na^+ ions upon the addition of 100µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = -372.3 ± 0.0492 pA and peak 2 = -356.1 ± 0.0268 pA.

Recording 2: 323.50 – 333.50 s

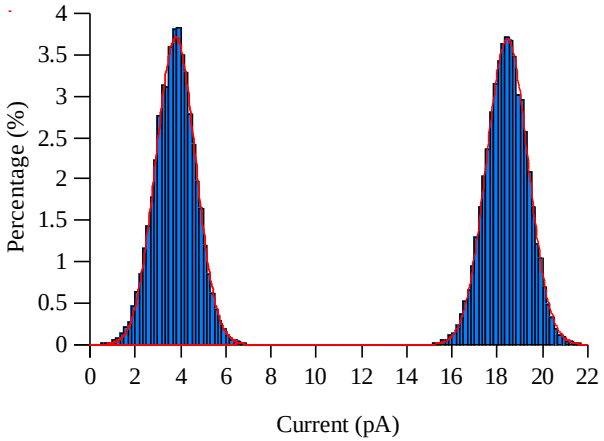
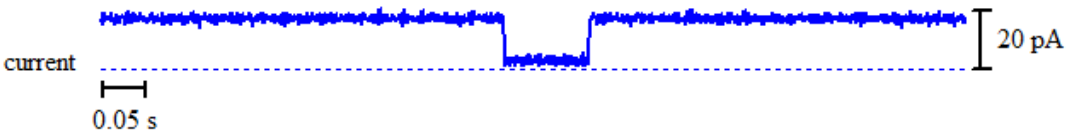


Figure A2 - 137: Above: bilayer activity of **14** with Na^+ ions upon the addition of 75µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 3.782 ± 0.0051 pA and peak 2 = 18.43 ± 0.0052 pA.

Recording 2: 443.10 – 444.10 s



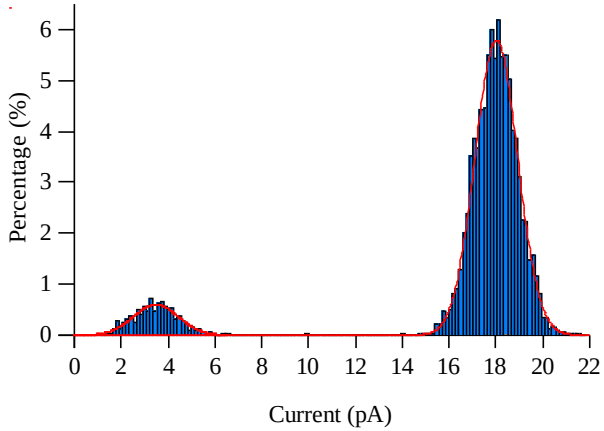
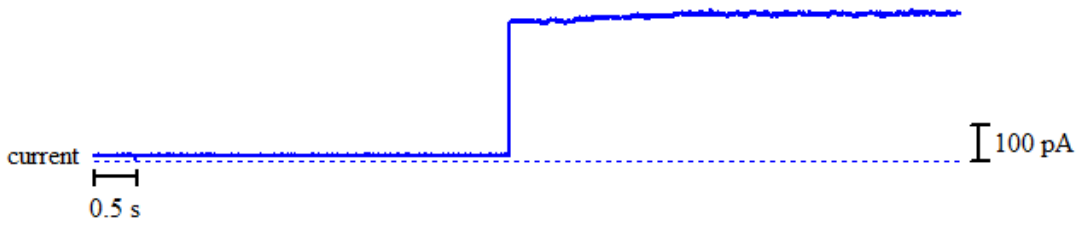


Figure A2 - 138: Above: bilayer activity of **14** with Na^+ ions upon the addition of 100µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 3.464 ± 0.0883 pA and peak 2 = 18.01 ± 0.0089 pA.

Recording 2: 503.00 – 513.00 s



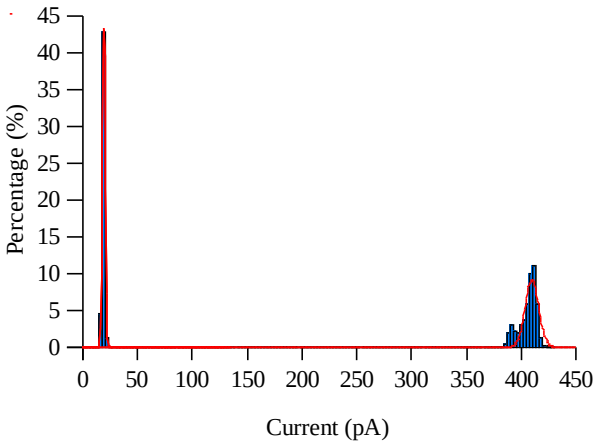
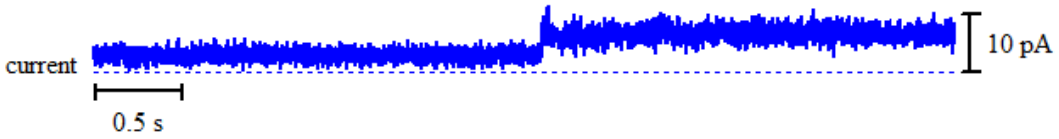


Figure A2 - 139: Above: bilayer activity of **14** with Na^+ ions upon the addition of 125µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 19.18 ± 0.0857 pA and peak 2 = 409.7 ± 0.3002 pA.

Recording 3: 620.00 – 630.00 s



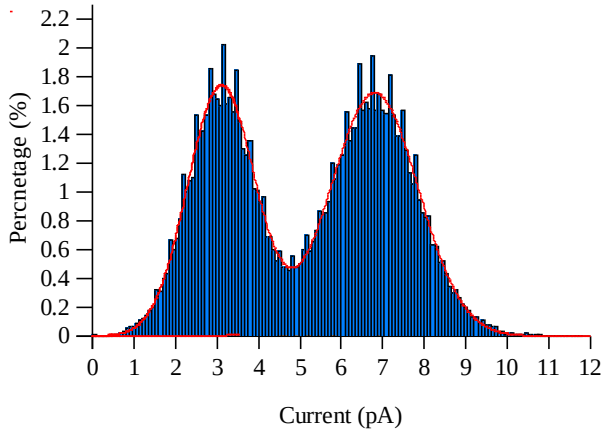


Figure A2 - 140: Above: bilayer activity of **14** with Na^+ ions upon the addition of 175µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 3.101 ± 0.0137 pA and peak 2 = 6.793 ± 0.0159 pA.

Recording 4: 355.10 - 358.10 s

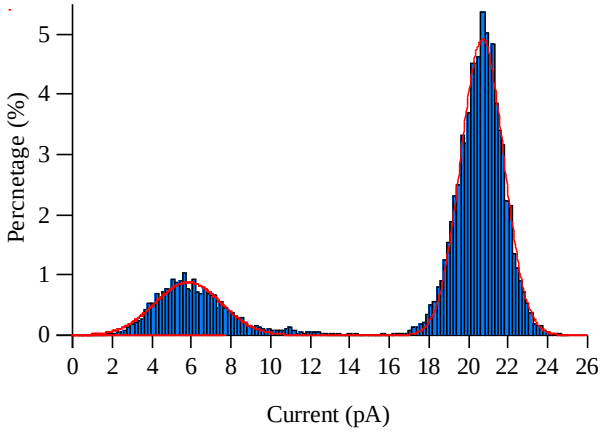
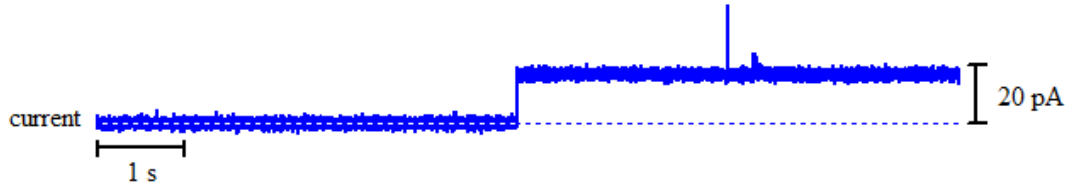


Figure A2 - 141: Above: bilayer activity of **14** with Na^+ ions upon the addition of 75µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 5.813 ± 0.0756 pA and peak 2 = 20.68 ± 0.0109 pA.

Recording 5: 287.00 – 297.00 s



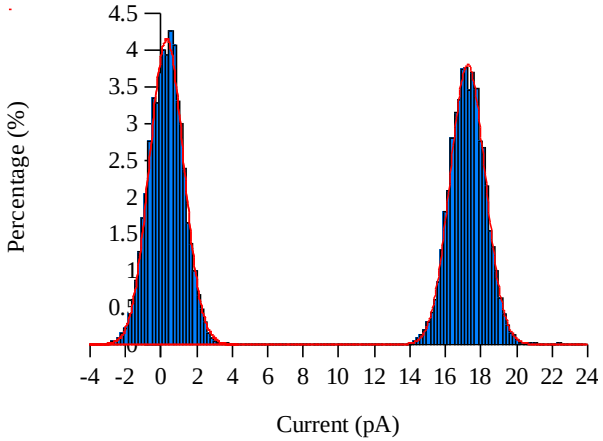
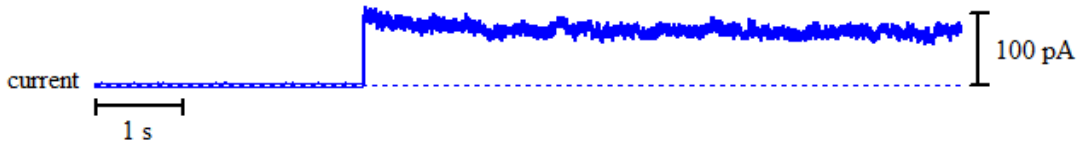


Figure A2 - 142: Above: bilayer activity of **14** with Na^+ ions upon the addition of 75µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.3026 ± 0.0086 pA and peak 2 = 17.25 ± 0.0095 pA.

Recording 6: 97.00 – 107.00 s



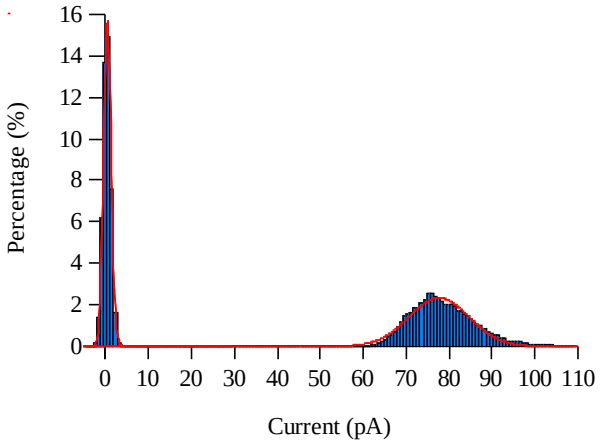
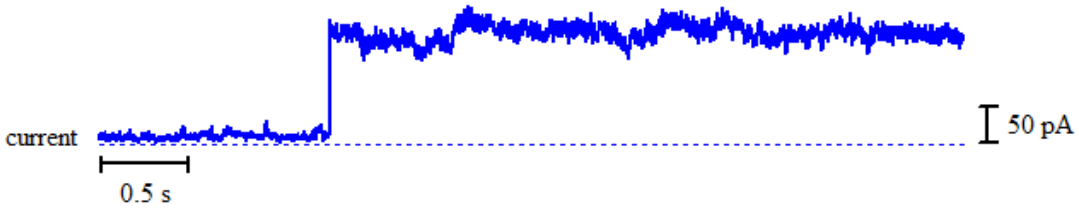


Figure A2 - 143: Above: bilayer activity of **14** with Na^+ ions upon the addition of 50µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.4345 ± 0.0070 pA and peak 2 = 77.52 ± 0.0996 pA.

Recording 7: 403.00 – 413.00 s



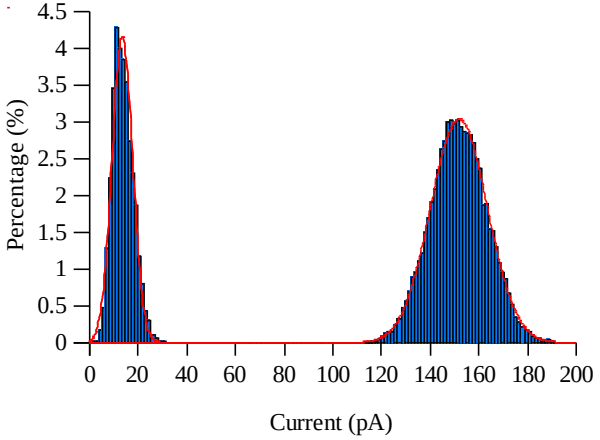


Figure A2 - 144: Above: bilayer activity of **14** with Na^+ ions upon the addition of 125µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 13.4 ± 0.0695 pA and peak 2 = 151.7 ± 0.1517 pA.

Recording 8: 158.00 – 182.00 s

Recording 8: 310.50 – 310.50 s

Recording 9: 303.00 – 309.00 s

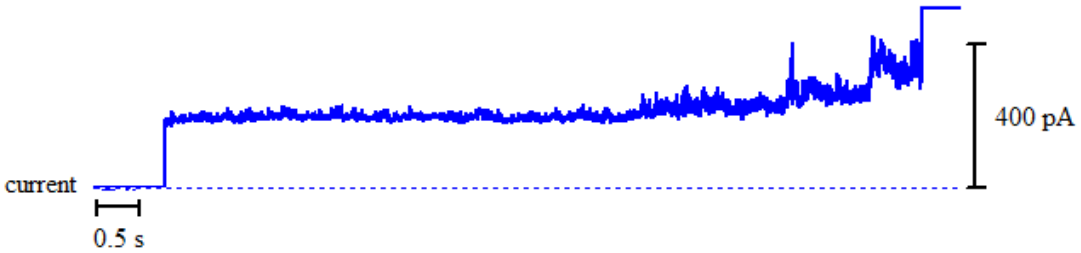
Recording 10: 303.00 – 311.00 s

Recording 11: 345.00 – 355.00 s

Figure A2 - 145: Bilayer activity of **14** with Na^+ ions upon the addition of 25µl (recording 8- left), 75ul (recording 8- right) and 100µl (recordings 9, 10 and 11) stock solution of **13** in DMSO.

Planar phospholipid bilayer activity of 14 towards K^+ across the POPE and POPS bilayer system

Recording 1: 408.00 – 413.00 s



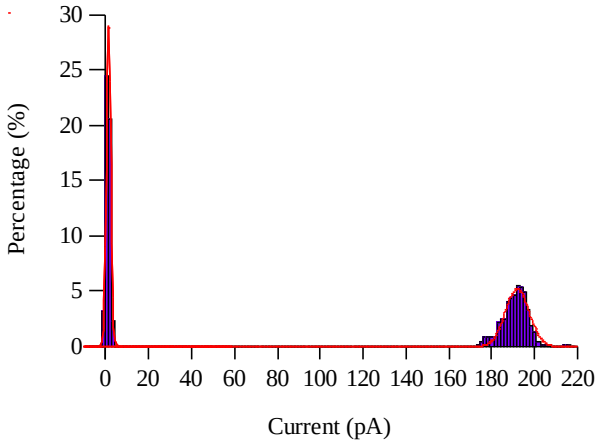
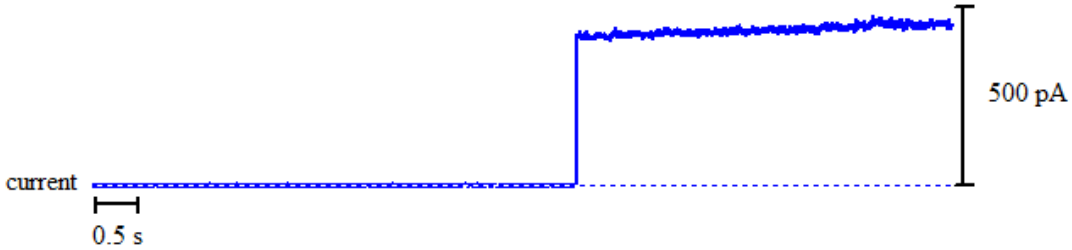


Figure A2 - 146: Above: bilayer activity of **14** with K^+ ions upon the addition of 100µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.276 ± 0.0167 pA and peak 2 = 191.7 ± 0.1162 pA.

Recording 2: 299.00 – 309.00 s



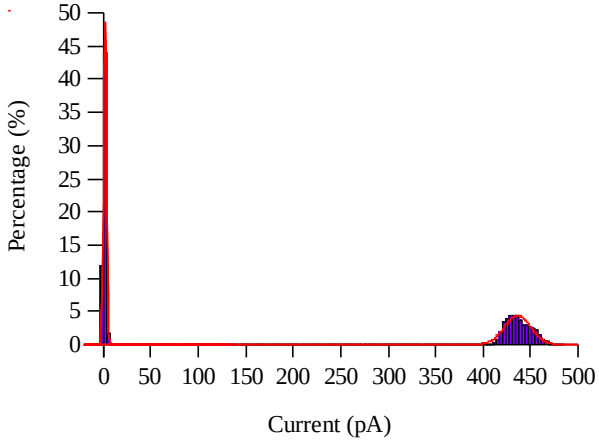
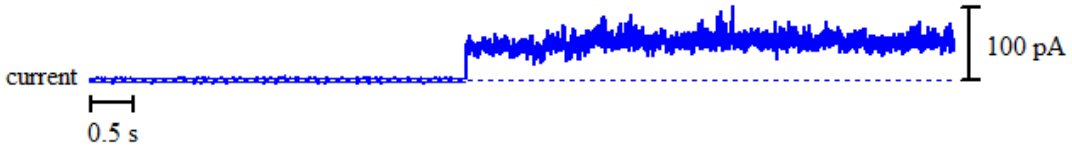


Figure A2 - 147: Above: bilayer activity of **14** with K^+ ions upon the addition of 75µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.808 ± 0.0255 pA and peak 2 = 435.9 ± 0.3281 pA.

Recording 3: 315.50 – 323.50 s



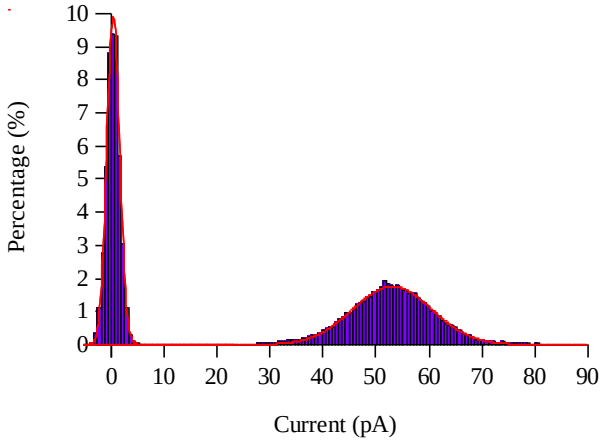


Figure A2 - 148: Above: bilayer activity of **14** with K^+ ions upon the addition of 75µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.4798 ± 0.0088 pA and peak 2 = 53.0 ± 0.1112 pA.

Recording 4: 432.50 – 438.00 s

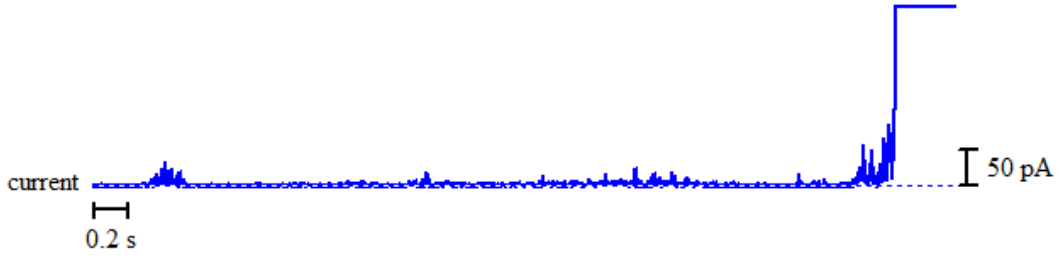
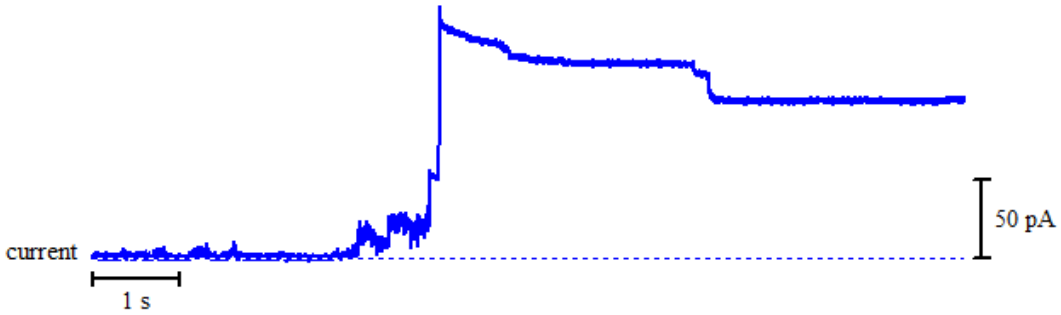


Figure A2 - 149: Bilayer activity of **14** with K^+ ions upon the addition of 100µl stock solution of **13** in DMSO.

Planar phospholipid bilayer activity of 14 towards Na^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 652.00 – 662.00 s



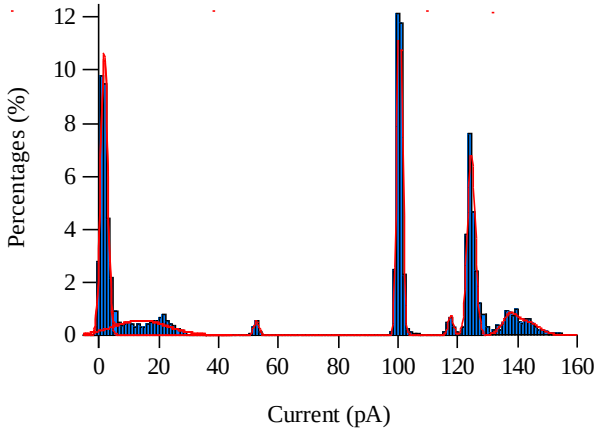
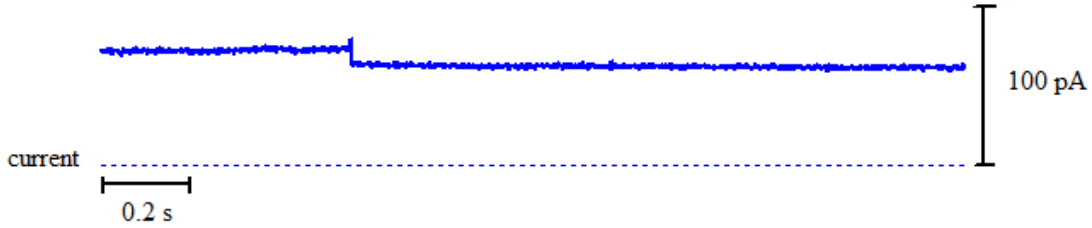


Figure A2 - 150: Above: bilayer activity of **14** with Na^+ ions upon the addition of 150µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.701 ± 0.0425 pA, peak 2 = 13.88 ± 5.4880 pA, peak 3 = 52.55 ± 0.0751 pA, peak 4 = 100.6 ± 0.0027 pA, peak 5 = 117.6 ± 1.0610 pA, peak 6 = 124.5 ± 0.1199 pA, peak 7 = 137.2 ± 0.8942 pA and peak 8 = 143.5 ± 2.5260 pA.

Recording 1: 877.30 - 887.30 s



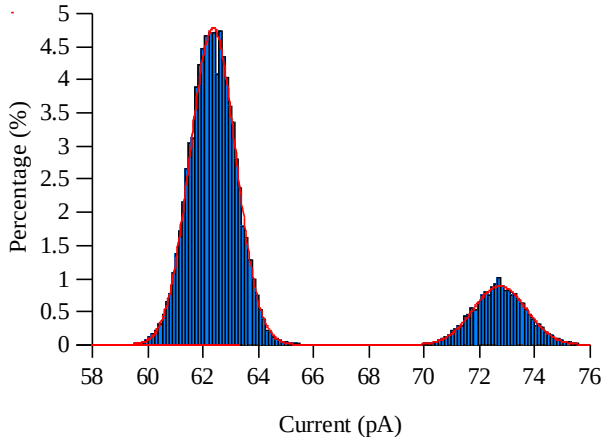
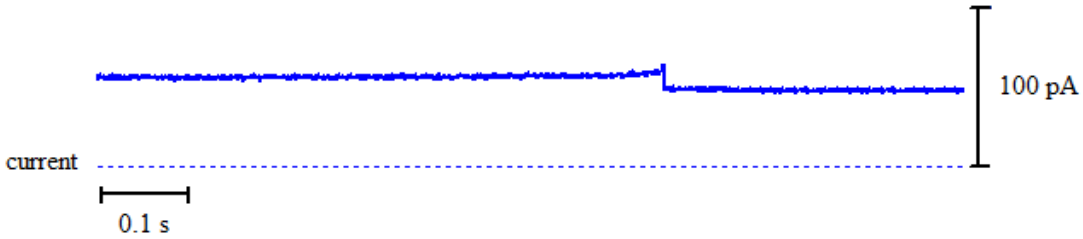


Figure A2 - 151: Above: bilayer activity of **14** with Na^+ ions upon the addition of 150µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 62.35 ± 0.0060 pA and peak 2 = 72.71 ± 0.0336 pA.

Recording 1: 1048.11 - 1049.11 s



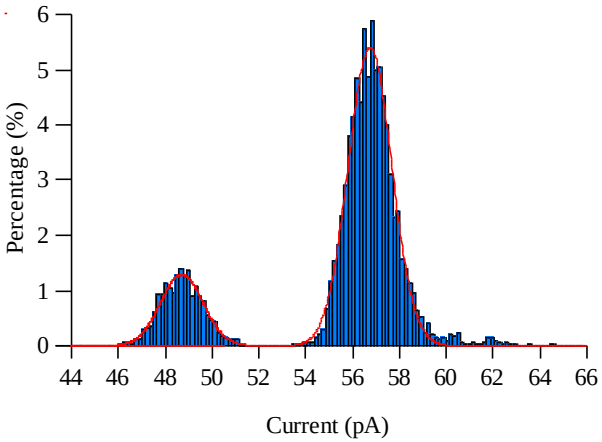
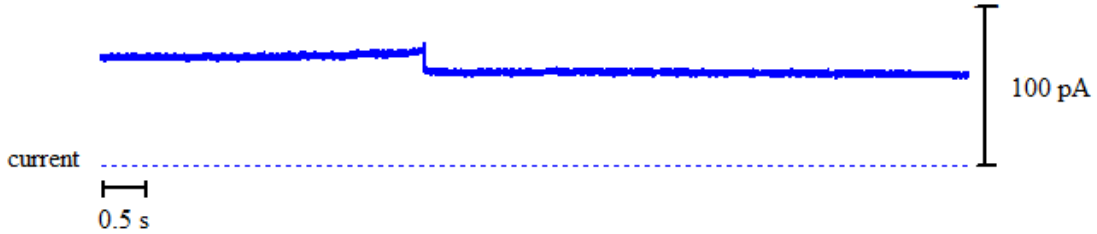


Figure A2 - 152: Above: bilayer activity of **14** with Na^+ ions upon the addition of 150µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 48.69 ± 0.0494 pA and peak 2 = 56.74 ± 0.0119 pA.

Recording 1: 1161.10 - 1162.10 s



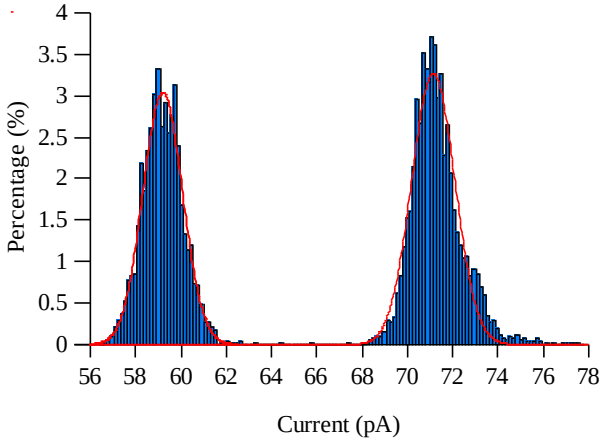
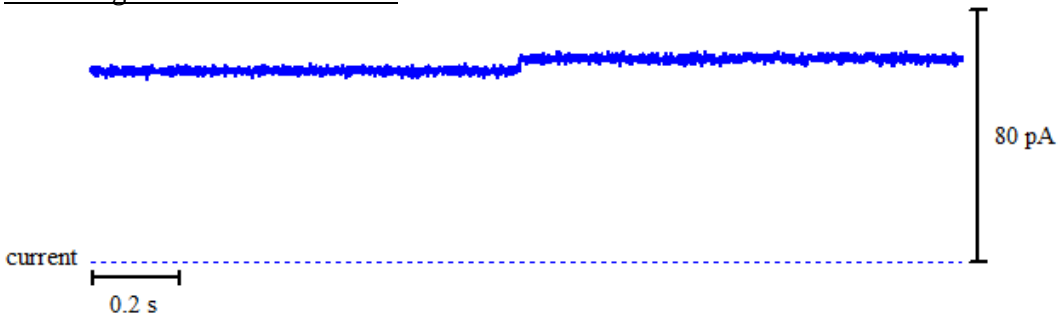


Figure A2 - 153: Above: bilayer activity of **14** with Na^+ ions upon the addition of 150µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 59.19 ± 0.0268 pA and peak 2 = 71.13 ± 0.0252 pA.

Recording 1: 1201.60 - 1203.60 s



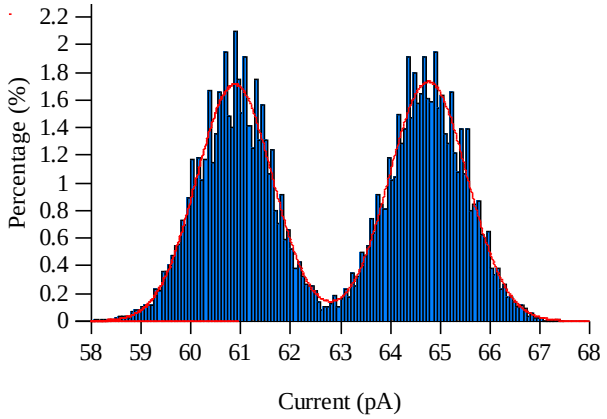
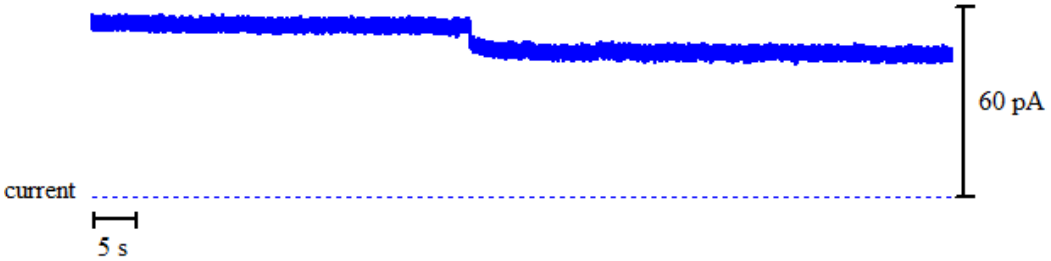


Figure A2 - 154: Above: bilayer activity of **14** with Na^+ ions upon the addition of 175µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 60.87 ± 0.0218 pA and peak 2 = 64.76 ± 0.0224 pA.

Recording 1: 1230.00 – 1330.00 s



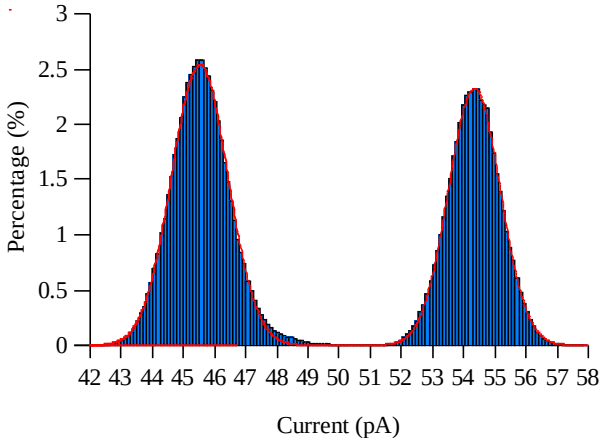


Figure A2 - 155: Above: bilayer activity of **14** with Na^+ ions upon the addition of 175µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 60.87 ± 0.0218 pA and peak 2 = 64.76 ± 0.0224 pA.

Recording 1: 1398.5 - 1403.5 s

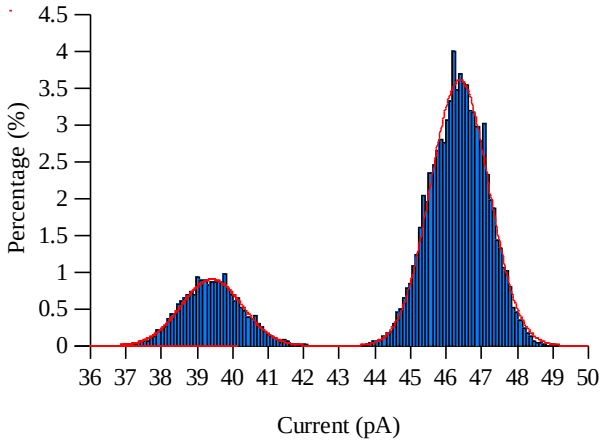


Figure A2 - 156: Above: bilayer activity of **14** with Na^+ ions upon the addition of 200µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 39.39 ± 0.0319 pA and peak 2 = 46.37 ± 0.0079 pA.

Recording 2: 597.00 – 602.00 s

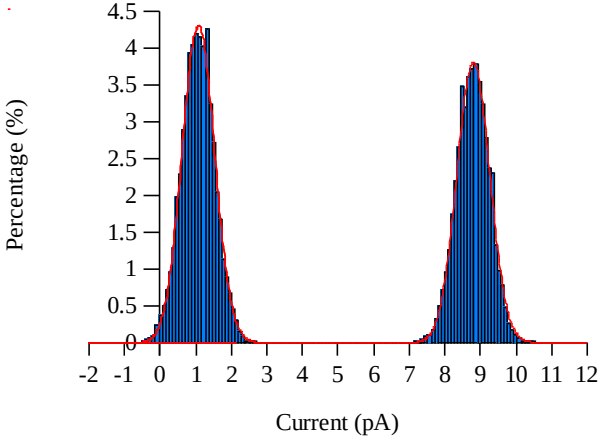
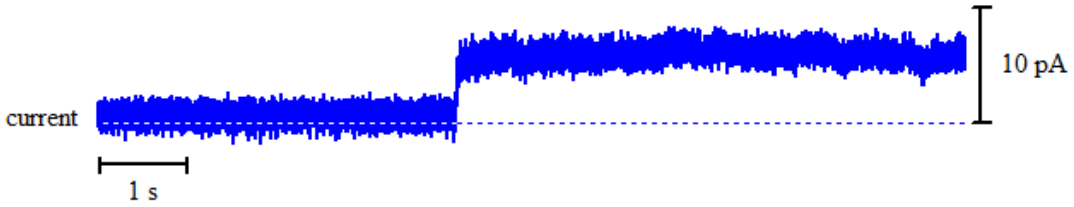


Figure A2 - 157: Above: bilayer activity of **14** with Na^+ ions upon the addition of 125µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.069 ± 0.0044 pA and peak 2 = 8.796 ± 0.0050 pA.

Planar phospholipid bilayer activity of 14 towards K^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 302.10 - 314.10 s



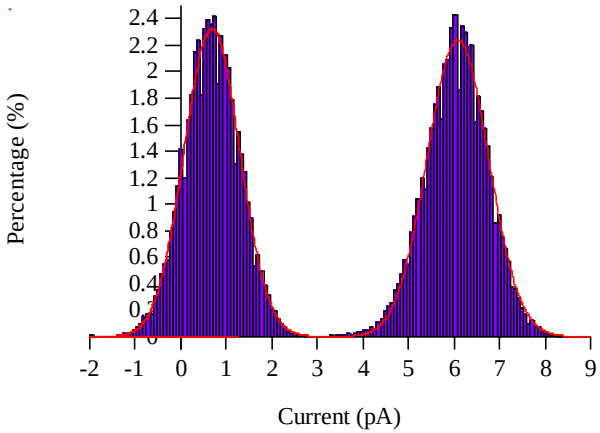
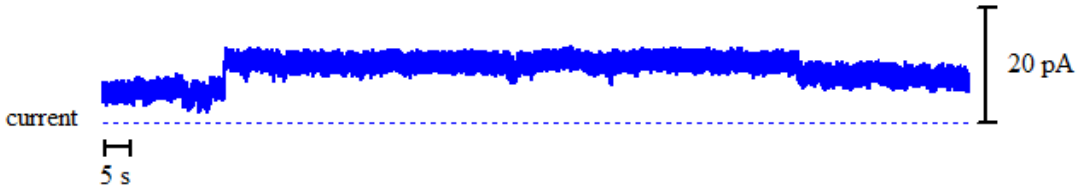


Figure A2 - 158: Above: bilayer activity of **14** with K^+ ions upon the addition of 75µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.6804 ± 0.0092 pA and peak 2 = 6.082 ± 0.0100 pA.

Recording 2: 497.00 - 637.00 s



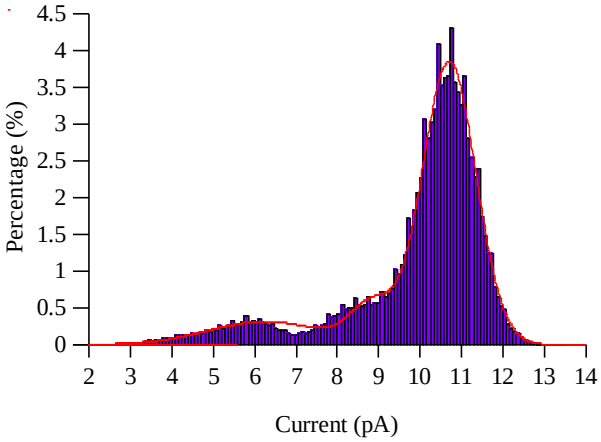
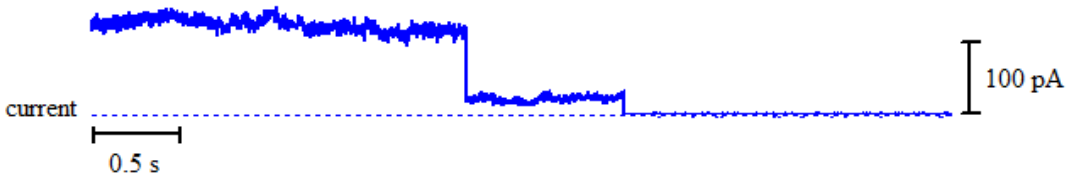


Figure A2 - 159: Above: bilayer activity of **14** with K^+ ions upon the addition of 75µl stock solution of **14** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 6.236 ± 0.0597 pA and peak 2 = 8.833 ± 0.1513 pA.

Planar phospholipid bilayer activity of 15 towards Na^+ across the POPE and POPS bilayer system

Recording 1: 280.00 - 290.00 s



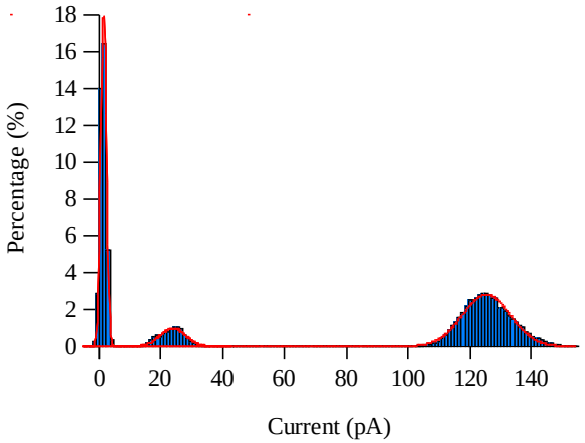


Figure A2 - 160: Above: bilayer activity of **15** with Na^+ ions upon the addition of 100µl stock solution of **15** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.575 ± 0.0051 pA, peak 2 = 23.86 ± 0.1865 pA and peak 3 = 125.3 ± 0.0750 pA.

Recording 1: 399.00 - 414.00 s

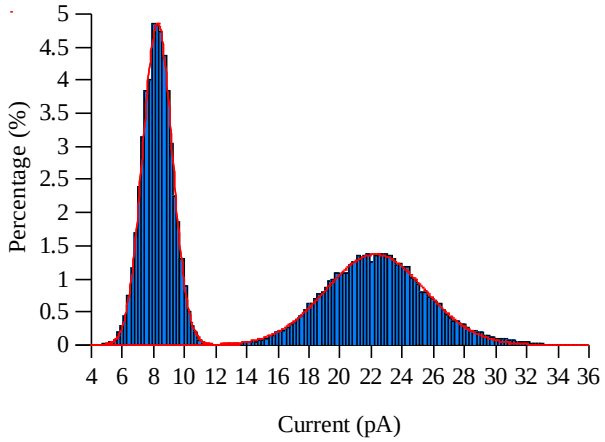
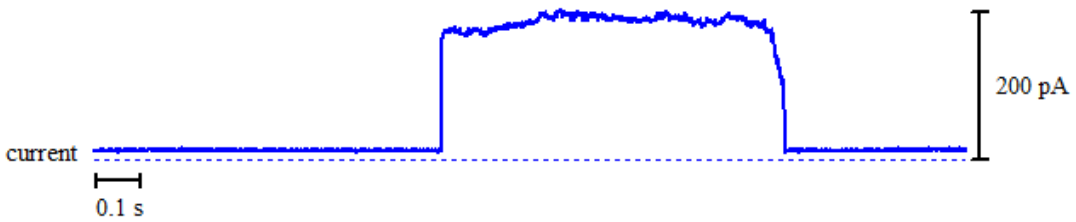


Figure A2 - 161: Above: bilayer activity of **15** with Na^+ ions upon the addition of 200µl stock solution of **15** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 8.243 ± 0.0050 pA and peak 2 = 22.24 ± 0.0318 pA.

Recording 1: 445.40 - 447.40 s



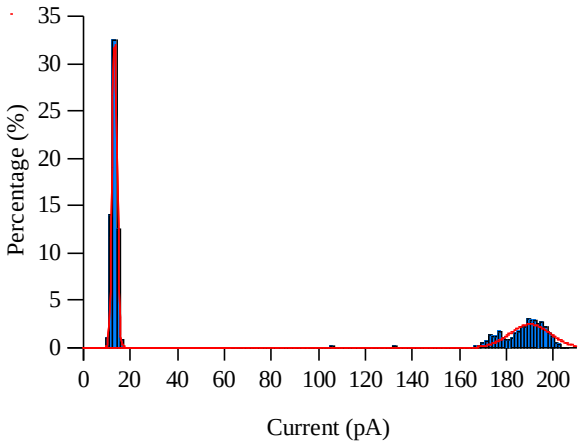
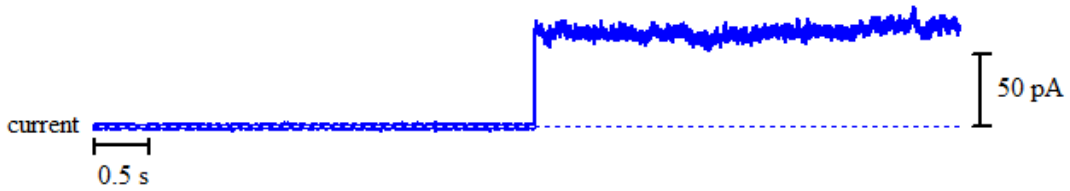


Figure 3.2.31: Above: bilayer activity of **15** with Na^+ ions upon the addition of 200µl stock solution of **15** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 13.26 ± 0.0170 pA and peak 2 = 189.9 ± 0.3542 pA.

Recording 2: 96.50 - 106.50 s



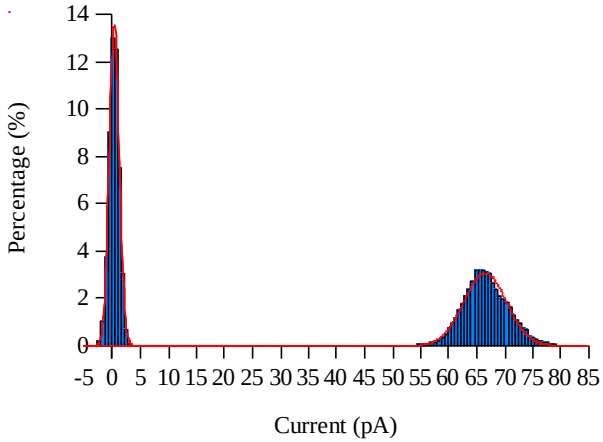
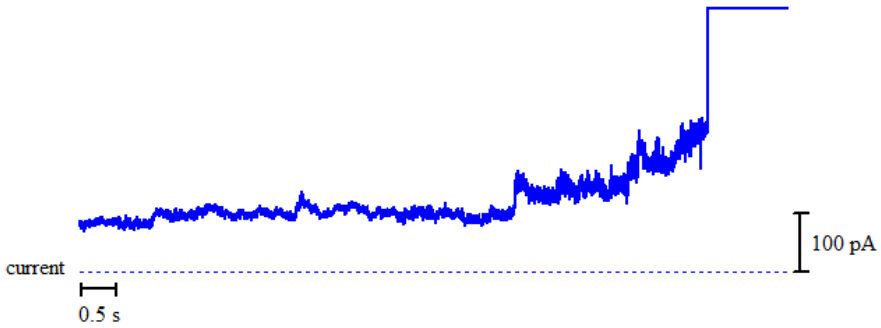


Figure A2 - 162: Above: bilayer activity of **15** with Na^+ ions upon the addition of 50µl stock solution of **15** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.3315 ± 0.0049 pA and peak 2 = 66.41 ± 0.0376 pA.

Recording 3: 120.00 – 130.00 s



Recording 4: 493.00 – 507.00 s

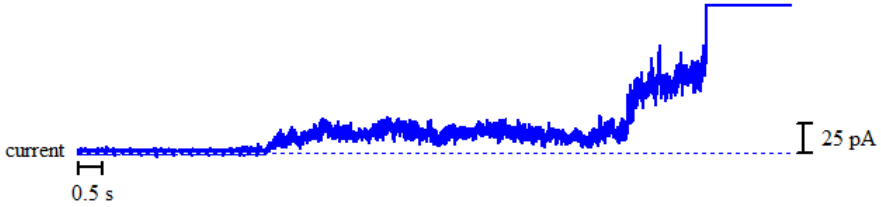


Figure A2 - 163: Bilayer activity of **15** with Na^+ ions upon the addition of 50µl (recording 3) and 100µl (recording 4) stock solution of **15** in DMSO.

Planar phospholipid bilayer activity of 15 towards K^+ across the POPE and POPS bilayer system

Recording 1: 309.00 - 318.00 s

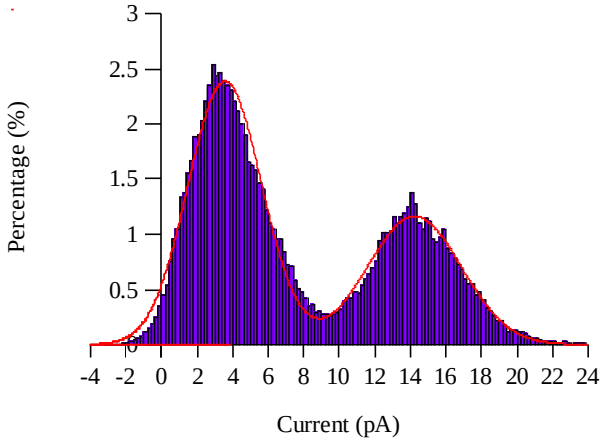


Figure A2 - 164: Above: bilayer activity of **15** with K^+ ions upon the addition of 75µl stock solution of **15** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 3.536 ± 0.0260 pA and peak 2 = 14.21 ± 0.0598 pA.

Recording 1: 400.00 - 413.00 s

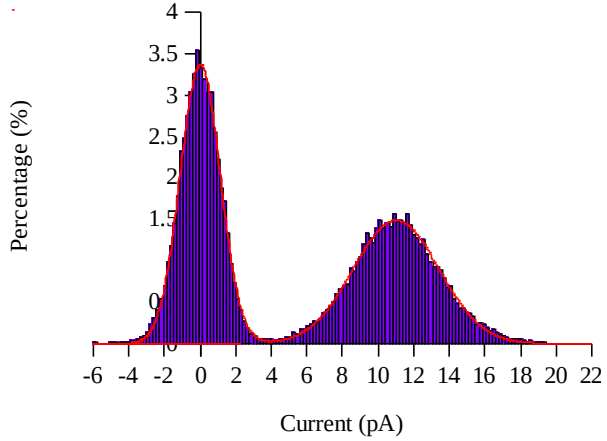
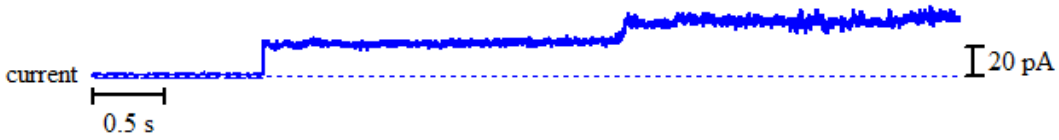


Figure A2 - 165: Above: bilayer activity of **15** with K^+ ions upon the addition of 75µl stock solution of **15** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = -0.0017 ± 0.0069 pA and peak 2 = 10.98 ± 0.0227 pA.

Recording 2: 913.00 - 918.00 s



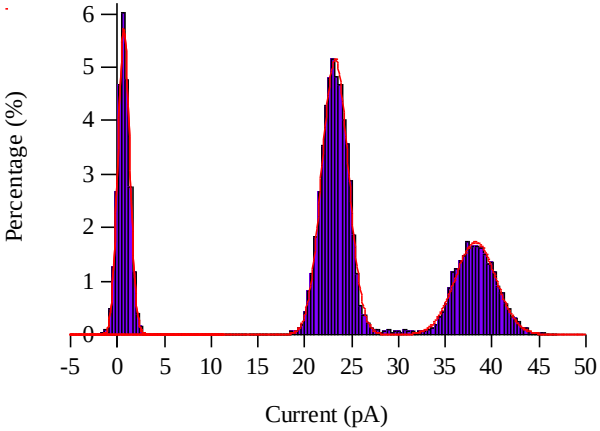
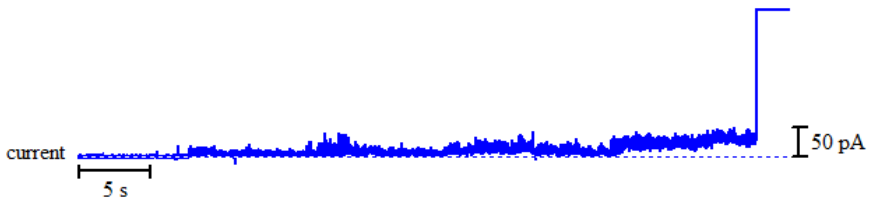


Figure A2 - 166: Above: bilayer activity of **15** with K^+ ions upon the addition of 250µl stock solution of **15** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.6839 ± 0.0068 pA, peak 2 = 23.22 ± 0.0114 pA and peak 3 = 38.18 ± 0.04161pA .

Recording 3: 470.00 – 515.00 s



Recording 4: 730.00 – 731.00 s

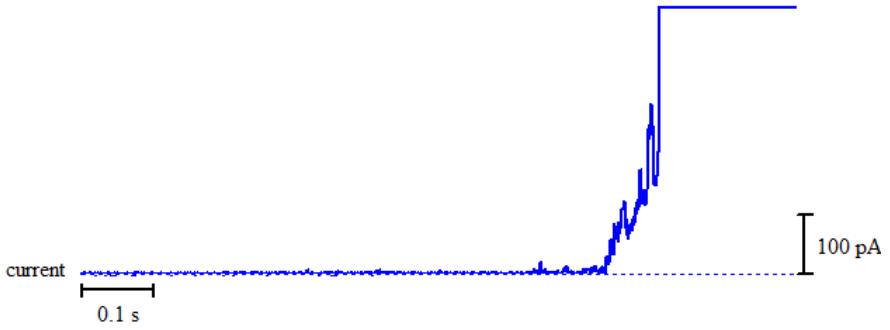


Figure A2 - 167: Bilayer activity of **15** with K^+ ions upon the addition of 100µl (recording 3) and 175µl (recording 4) stock solution of **15** in DMSO.

Recording 5: 160.00 – 170.00 s

Recording 5: 170.00 – 180.00 s

Recording 6: 177.00 – 188.00 s

Recording 7: 739.00 – 754.00 s

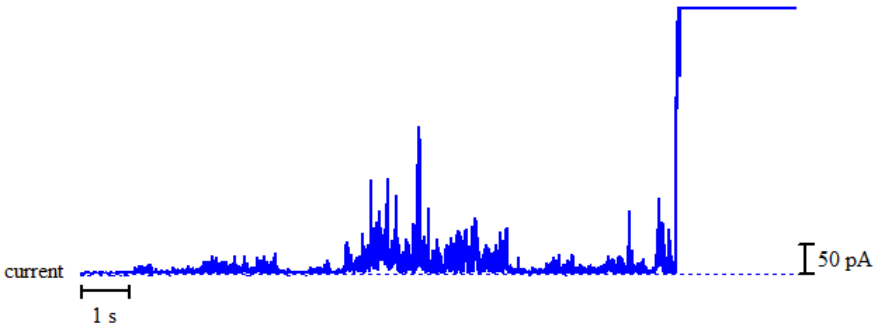
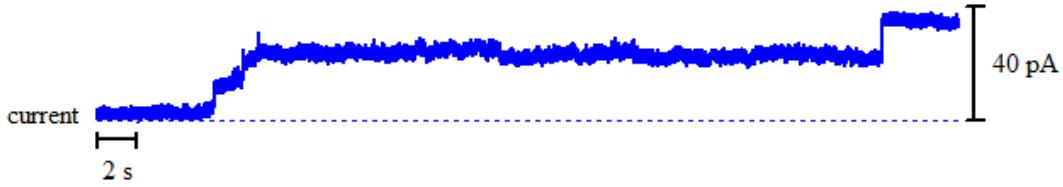


Figure A2 - 168: Bilayer activity of **15** with K^+ ions upon the addition of 25µl (recordings 5 and 6) and 175µl (recording 7) stock solution of **15** in DMSO.

Planar phospholipid bilayer activity of 15 towards Na^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 96.50 - 106.50 s



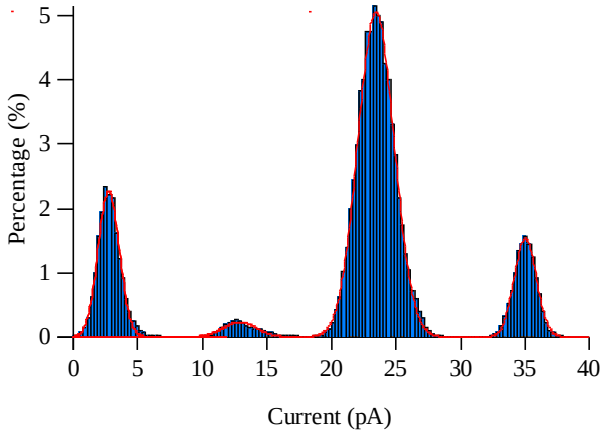
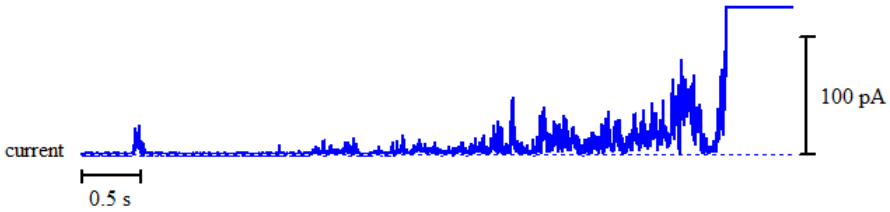


Figure A2 - 169: Above: bilayer activity of **15** with Na^+ ions upon the addition of 100µl stock solution of **15** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 2.746 ± 0.0104 pA, peak 2 = 12.88 ± 0.1252 pA, peak 3 = 23.42 ± 0.0090 pA, and peak 4 = 35.03 ± 0.0239 pA.

Recording 1: 1483.00 – 153.00 s



Recording 2: 795.00 – 825.00 s

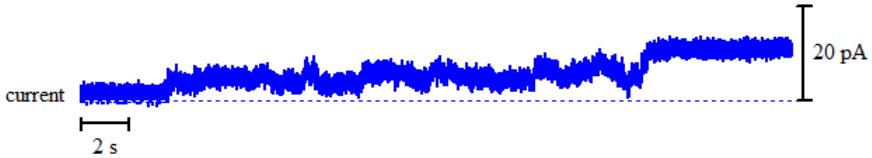
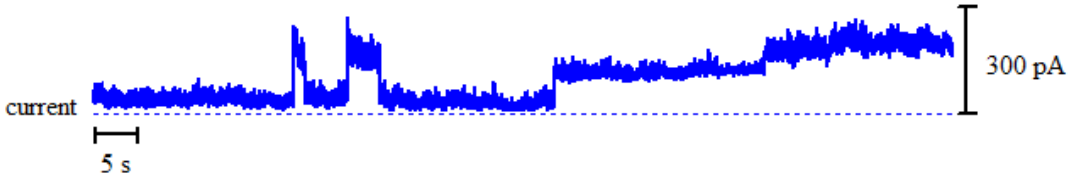


Figure A2 - 170: Bilayer activity of **15** with Na^+ ions upon the addition of 25µl (recording 1) and 175µl (recording 2) stock solution of **15** in DMSO.

Planar phospholipid bilayer activity of 15 towards K^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 1140.00 – 1205.00 s



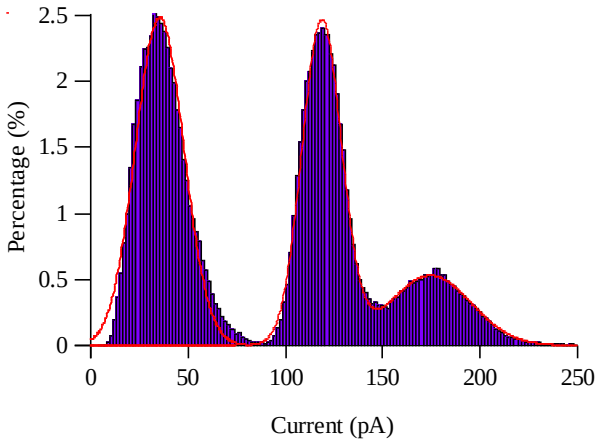
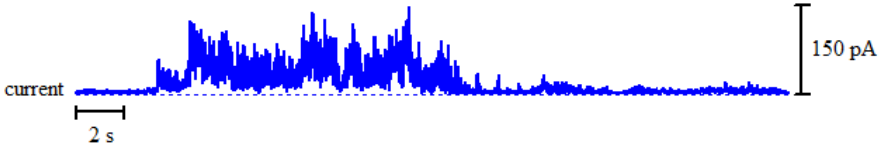


Figure A2 - 171: Above: bilayer activity of **15** with K^+ ions upon the addition of 175µl stock solution of **15** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 35.34 ± 0.1766 pA, peak 2 = 118.6 ± 0.182 pA and peak 3 = 174.2 ± 1.214 pA.

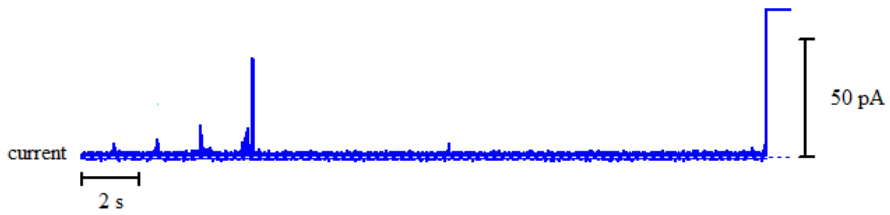
Recording 1: 284.50 – 304.50 s



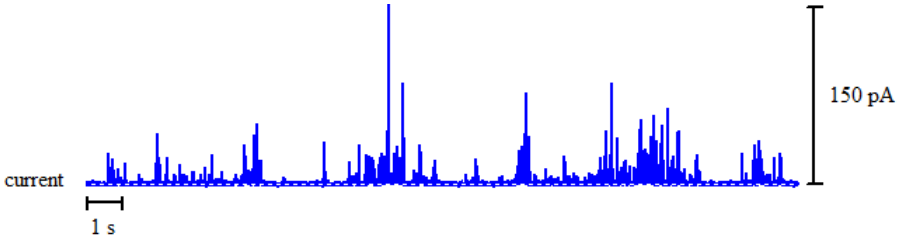
Recording 2: 650.00 – 730.00 s

Figure A2 - 172: Bilayer activity of **15** with K^+ ions upon the addition of 50µl (recording 1) and 150µl (recording 2) stock solution of **15** in DMSO.

Recording 3: 122.00 – 242.00 s



Recording 4: 117.00 – 137.00 s



Recording 5: 162.00 – 176.00 s

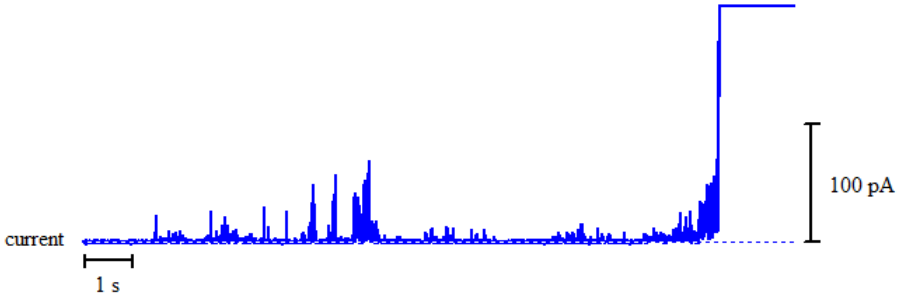
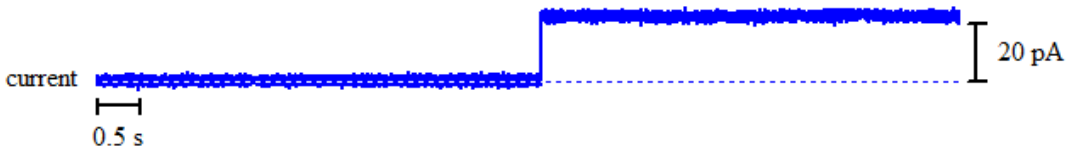


Figure A2 - 173: Bilayer activity of **15** with K^+ ions upon the addition of 25µl (recordings 3, 4 and 5) stock solution of **15** in DMSO.

Planar phospholipid bilayer activity of 16 towards Na^+ across the POPE and POPS bilayer system

Recording 1: 198.00 - 208.00 s



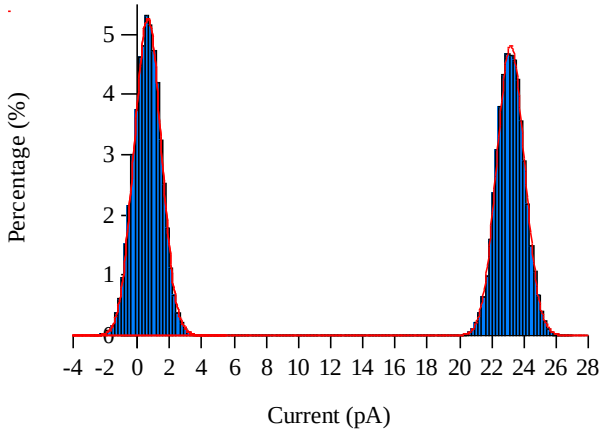
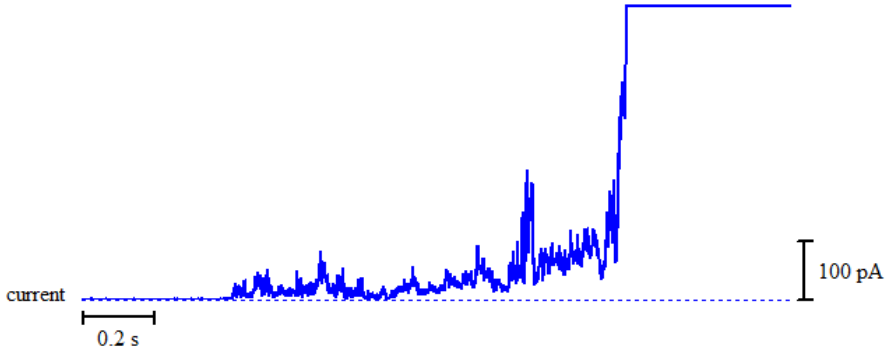


Figure A2 - 174: Above: bilayer activity of **16** with Na^+ ions upon the addition of 50µl stock solution of **16** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.6308 ± 0.0031 pA and peak 2 = 23.17 ± 0.0035 pA.

Recording 2: 128.00 – 131.00 s



Recording 3: 177.50 – 193.50 s

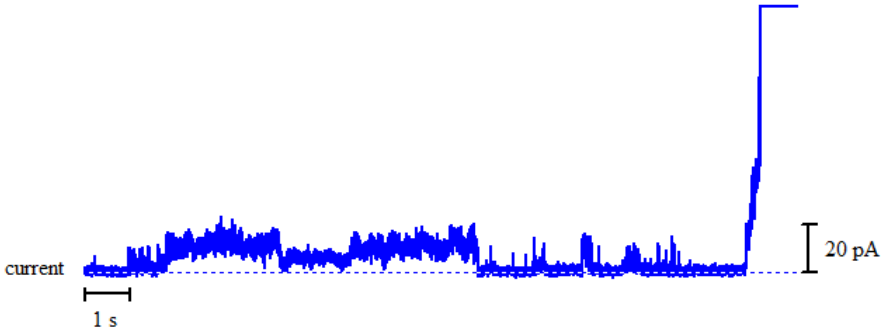


Figure A2 - 175: Bilayer activity of **16** with Na^+ ions upon the addition of 25µl (recording 2) and 50µl (recording 3) stock solution of **16** in DMSO.

Planar phospholipid bilayer activity of 16 towards K^+ across the POPE and POPS bilayer system

Recording 1: 411.00 – 419.00 s

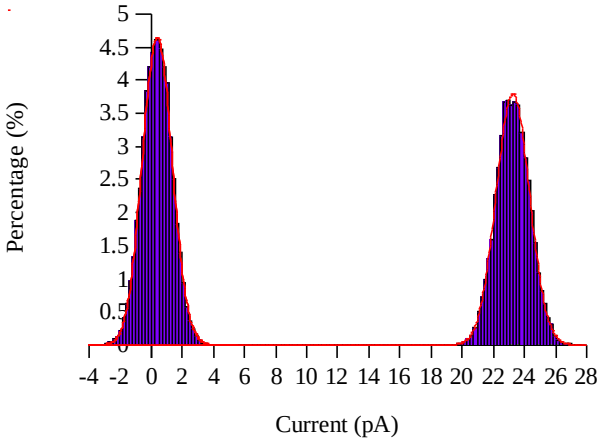
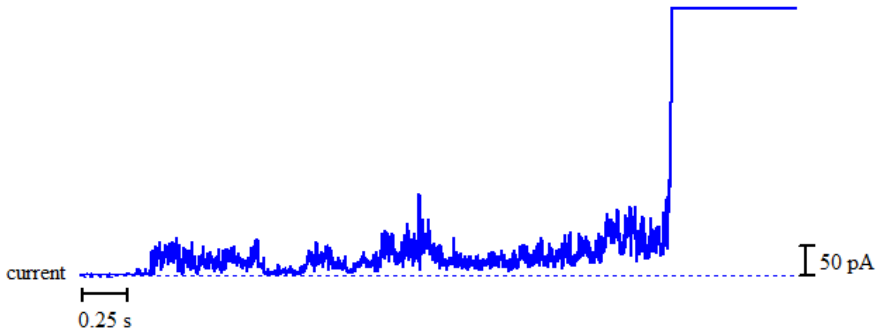


Figure A2 - 176: Above: bilayer activity of **16** with K^+ ions upon the addition of 100µl stock solution of **16** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.3797 ± 0.0047 pA and peak 2 = 23.25 ± 0.0060 pA.

Recording 2: 577.00 – 581.00 s



Recording 3: 574.00 – 580.00 s

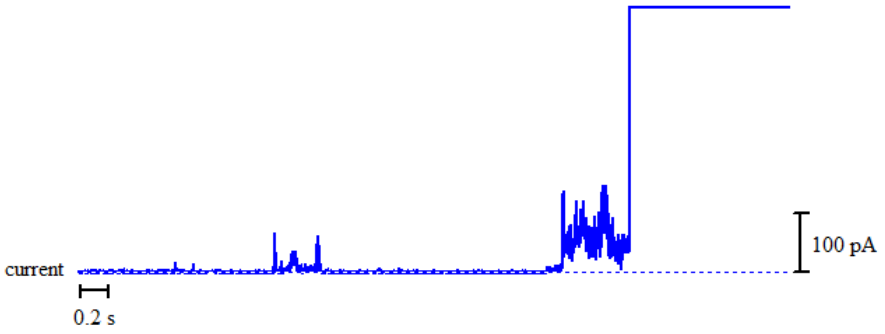
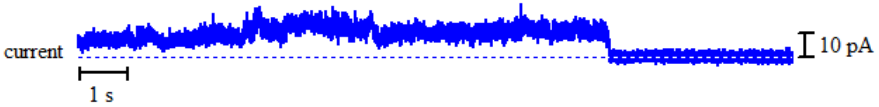


Figure A2 - 177: Bilayer activity of **16** with K^+ ions upon the addition of 125µl (recordings 2 and 3) stock solution of **16** in DMSO.

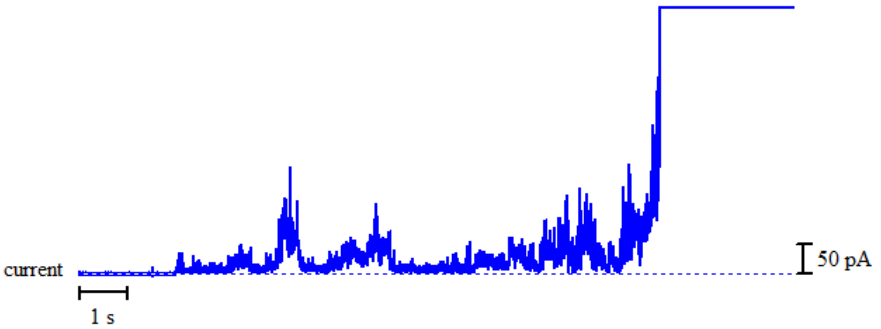
Recording 4: 242.50 – 247.50 s

Recording 4: 249.00 – 263.00 s

Recording 4: 339.00 – 353.00 s



Recording 5: 538.00 – 552.00 s



Recording 6: 665.00 – 684.00 s

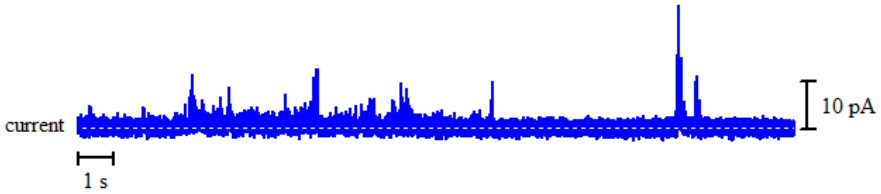
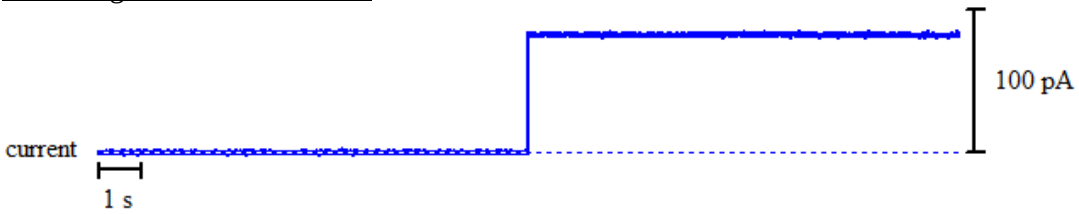


Figure A2 - 178: Bilayer activity of **16** with K^+ ions upon the addition of 50µl (recordings 4- top left and right), 75µl (recording 4- centre left), 125µl (recording 5) and 150µl (recording 6) stock solution of **16** in DMSO.

Planar phospholipid bilayer activity of 16 towards Na^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 790.00 – 810.00 s



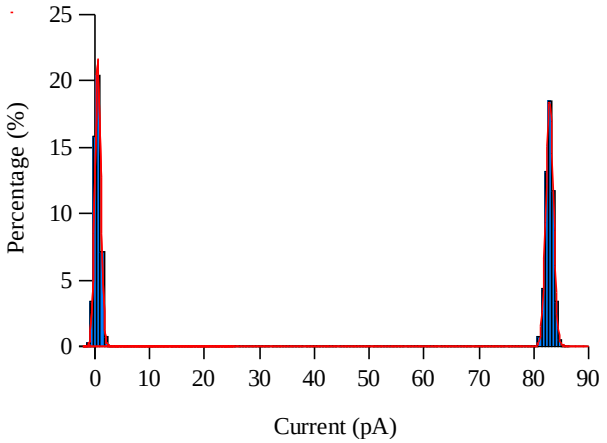
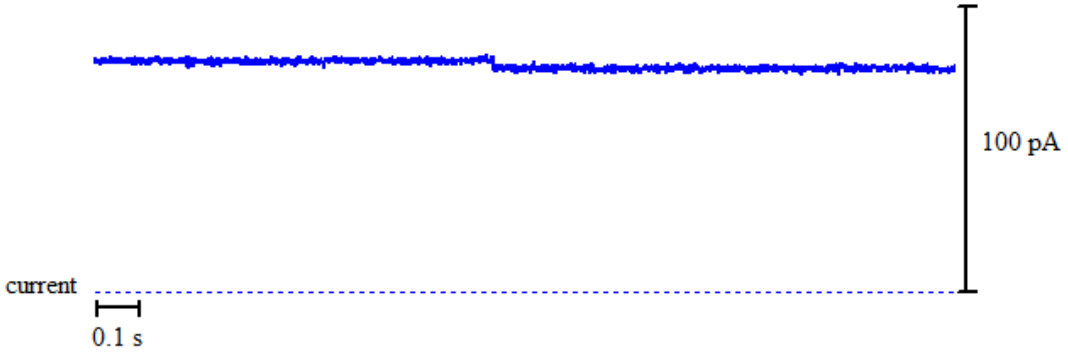


Figure A2 - 179: Above: bilayer activity of **16** with Na^+ ions upon the addition of 175µl stock solution of **16** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.5717 ± 0.0005 pA and peak 2 = 82.89 ± 0.0005 pA.

Recording 2: 898.00 – 901.00 s



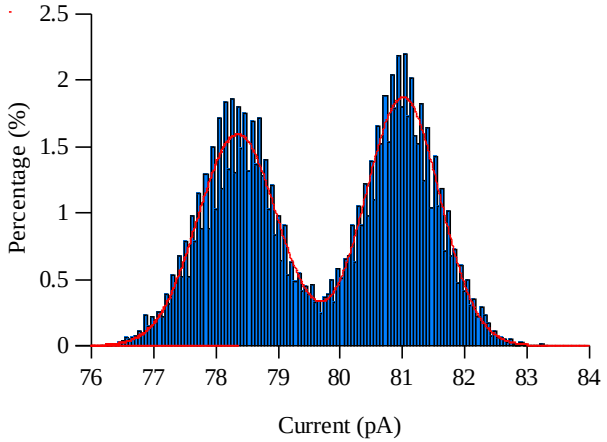
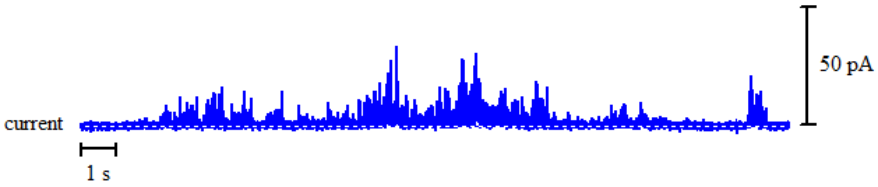


Figure A2 - 180: Above: bilayer activity of **16** with Na^+ ions upon the addition of 175µl stock solution of **16** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 78.34 ± 0.0352 pA and peak 2 = 81.0 ± 0.0303 pA.

Recording 3: 130.00 – 150.00 s



Recording 4: 351.00 – 360.00 s

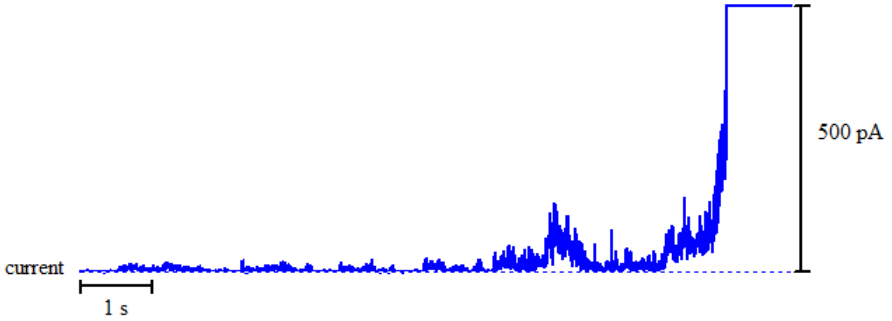
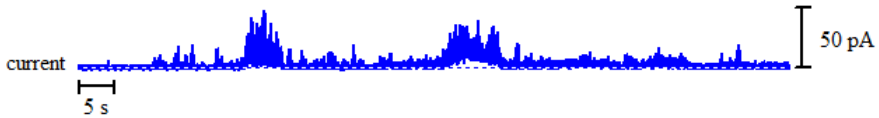


Figure A2 - 181: Bilayer activity of **16** with Na^+ ions upon the addition of 25µl (recording 3) and 75µl (recording 4) stock solution of **16** in DMSO.

Planar phospholipid bilayer activity of 16 towards K^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 220.00 – 300.00 s



Recording 1: 1300.00 – 1350.00 s

Figure A2 - 182: Bilayer activity of **16** with K^+ ions upon the addition of 50µl (recording 1- left) and 175µl (recording 1- right) stock solution of **16** in DMSO.

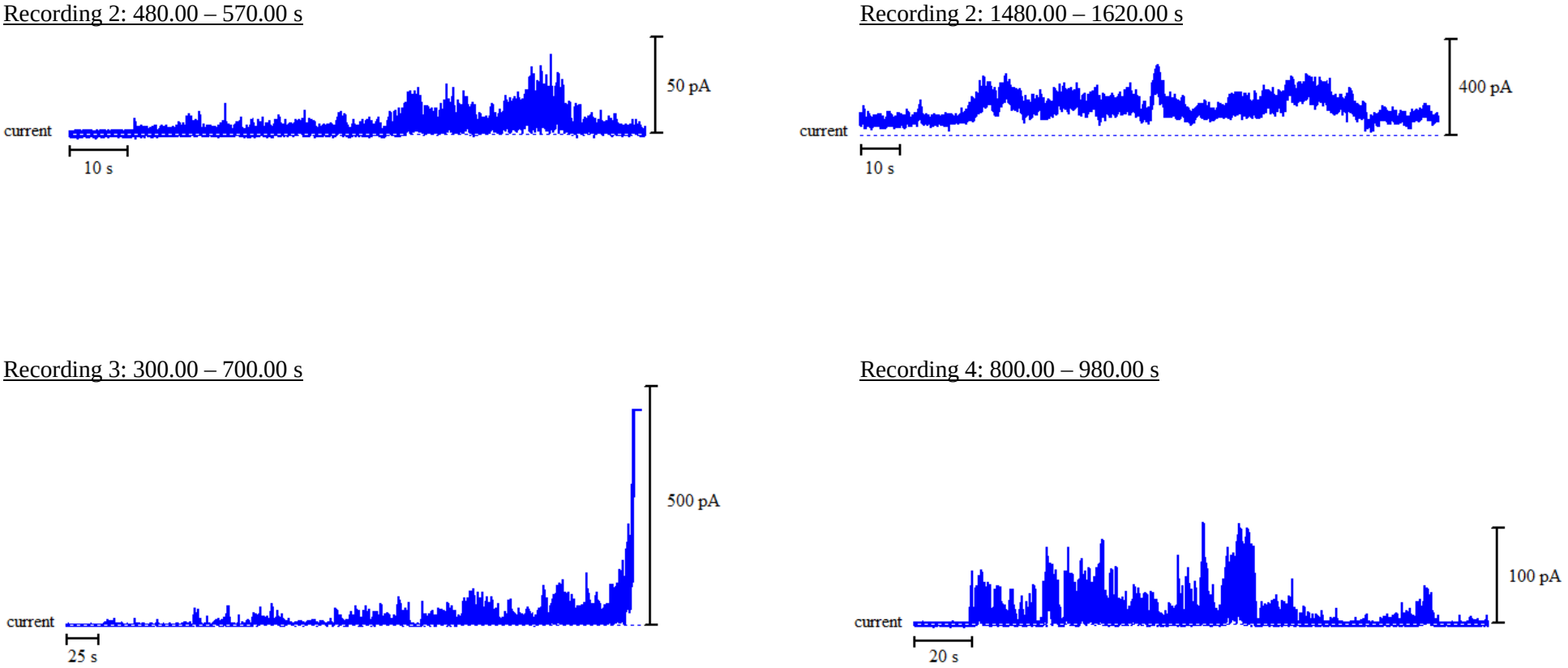


Figure A2 - 183: Bilayer activity of **16** with K^+ ions upon the addition of 100µl (Recording 2- left), 200µl (Recording 2- right), 125µl (Recording 3) and 175µl (Recording 4) stock solution of **16** in DMSO.

Planar phospholipid bilayer activity of 17 towards Na^+ across the POPE and POPS bilayer system

Recording 1: 913.00 – 923.00 s

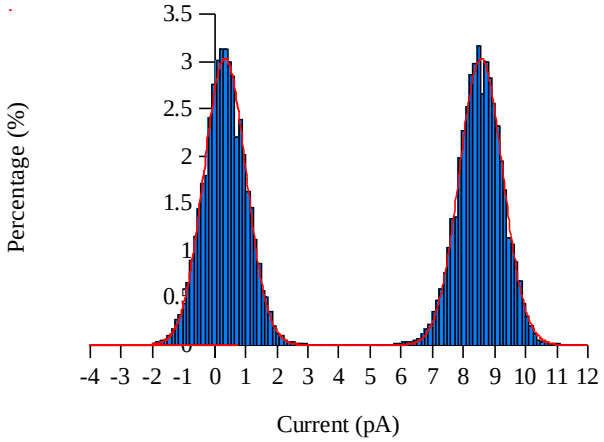
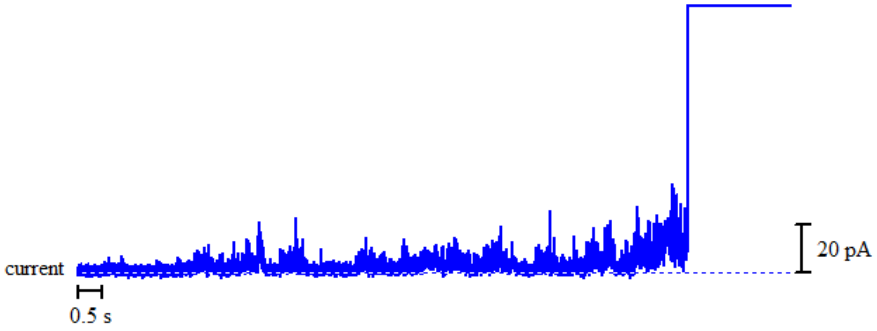


Figure A2 - 184: Above: bilayer activity of **17** with Na^+ ions upon the addition of 250µl stock solution of **17** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.3271 ± 0.0072 pA and peak 2 = 8.563 ± 0.0073 pA.

Recording 2: 624.00 – 638.00 s



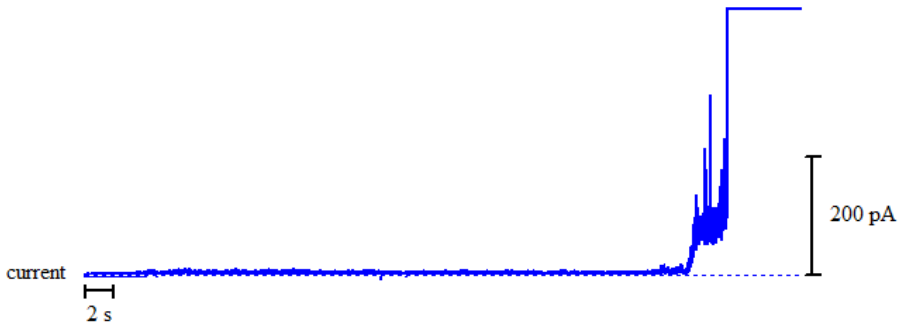
Recording 3: 600.00 – 613.00 s

Figure A2 - 185: Bilayer activity of **17** with Na^+ ions upon the addition of 150µl (recordings 2 and 3) stock solution of **17** in DMSO.

Planar phospholipid bilayer activity of 17 towards K^+ across the POPE and POPS bilayer system

Recording 1: 165.00 – 174.00 s

Recording 2: 110.00 – 155.00 s



Recording 3: 308.50 – 312.00 s

Recording 4: 358.77 – 358.90 s

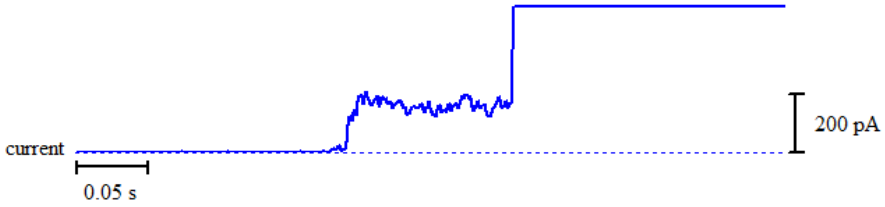


Figure A2 - 186: Bilayer activity of **17** with K^+ ions upon the addition of 25µl (recordings 1 and 2) and 75µl (recordings 3 and 4) stock solution of **17** in DMSO.

Recording 5: 476.71 – 459.62 s

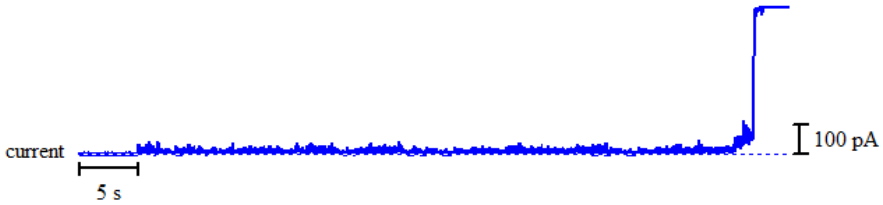


Figure A2 - 187: Bilayer activity of **17** with K^+ ions upon the addition of 100µl (recording 5), stock solution of **17** in DMSO.

Planar phospholipid bilayer activity of 17 towards Na^+ across the DLPE, DLPS and cholesterol bilayer system

No activity was produced with **17** towards Na^+ across this bilayer system

Planar phospholipid bilayer activity of 17 towards K^+ across the DLPE, DLPS and cholesterol bilayer system

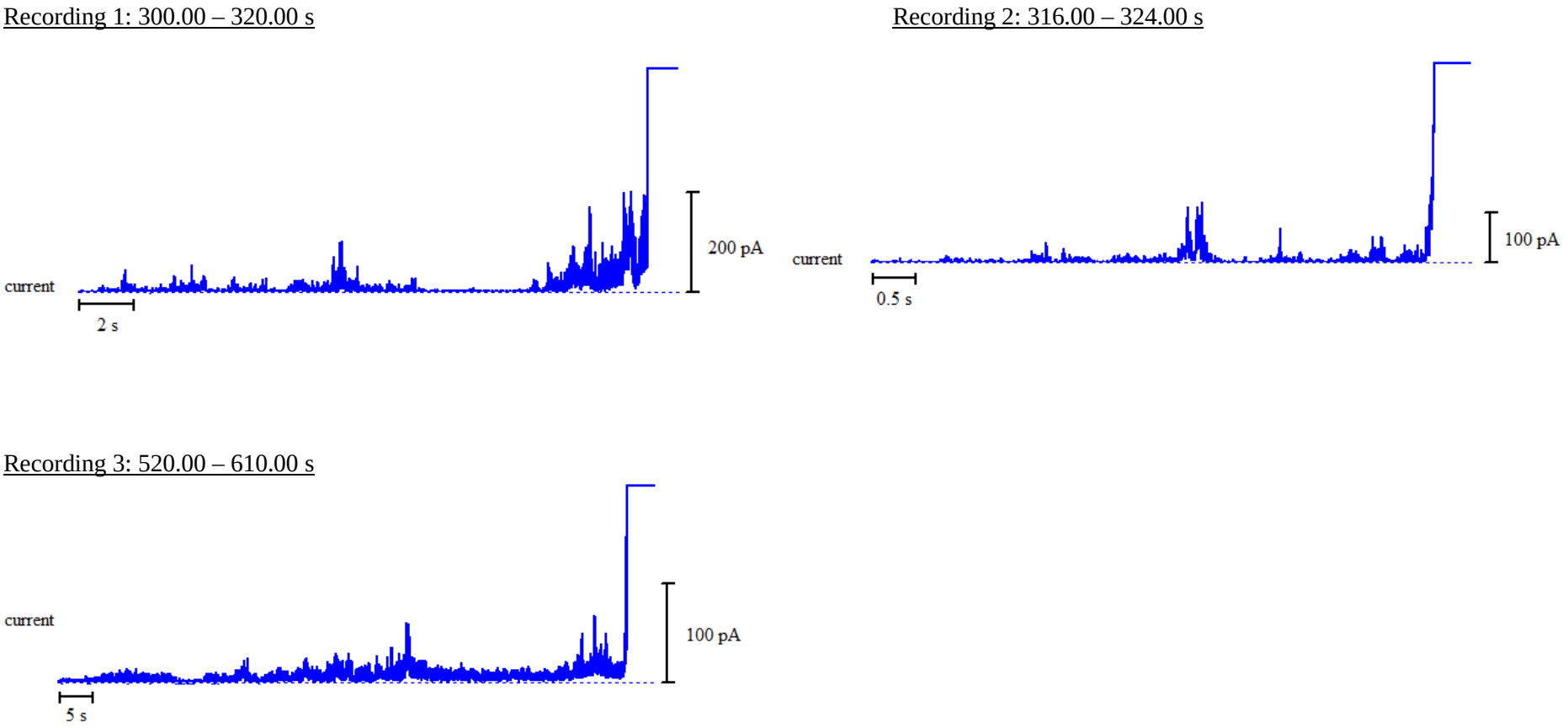
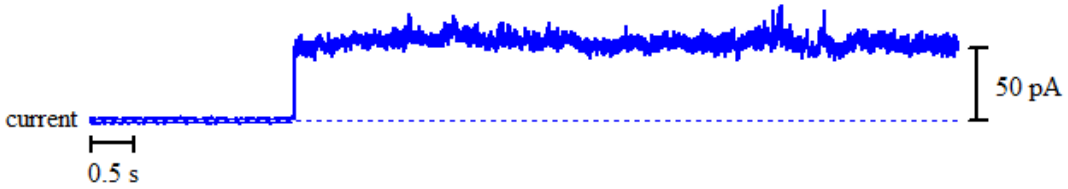


Figure A2 - 188: Bilayer activity of **17** with K^+ ions upon the addition of 50µl (recording 1), 75µl (recording 2) and 100µl (recording 3), stock solution of **17** in DMSO.

Planar phospholipid bilayer activity of 18 towards Na^+ across the POPE and POPS bilayer system

Recording 1: 203.00 – 213.00 s



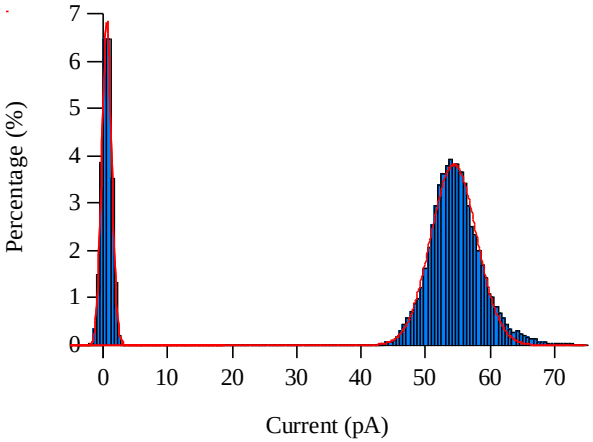
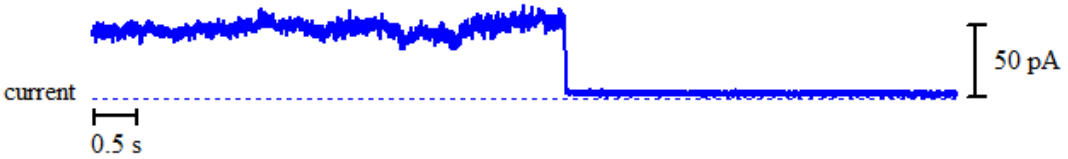


Figure A2 - 189: Above: bilayer activity of **18** with Na^+ ions upon the addition of 50µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.5316 ± 0.0099 pA and peak 2 = 54.36 ± 0.0317 pA.

Recording 1: 219.00 – 229.00 s



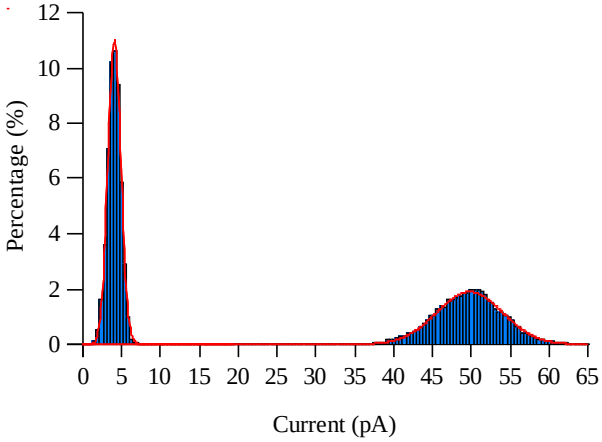


Figure A2 - 190: Above: bilayer activity of **18** with Na^+ ions upon the addition of 50µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 4.045 ± 0.0040 pA and peak 2 = 49.73 ± 0.0458 pA.

Recording 1: 243.00 – 253.00 s

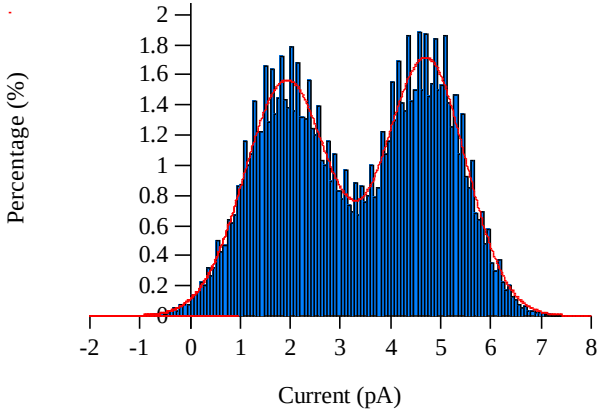
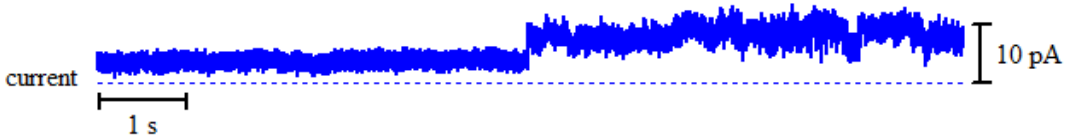


Figure A2 - 191: Above: bilayer activity of **18** with Na^+ ions upon the addition of 50µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.915 ± 0.0226 pA and peak 2 = 4.695 ± 0.0202 pA.

Recording 1: 461.00 – 471.00 s



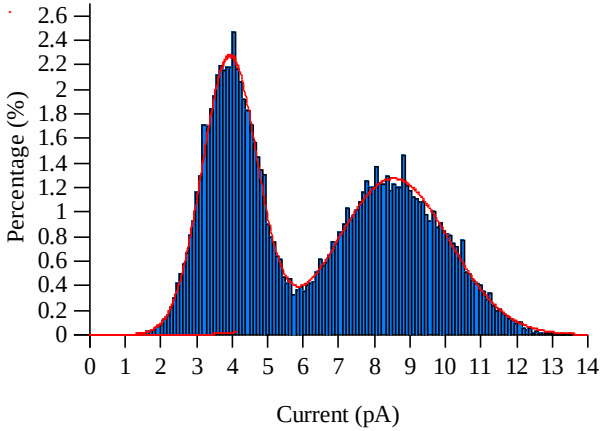


Figure A2 - 192: Above: bilayer activity of **18** with Na^+ ions upon the addition of 100µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 3.927 ± 0.0079 pA and peak 2 = 8.524 ± 0.0196 pA.

Recording 2: 239.00 – 249.00 s

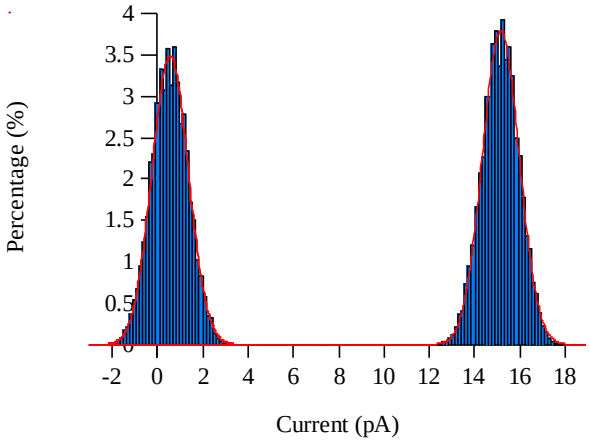


Figure A2 - 193: Above: bilayer activity of **18** with Na^+ ions upon the addition of 50µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.5521 ± 0.0097 pA and peak 2 = 15.16 ± 0.0086 pA.

Recording 2: 337.00 – 347.00 s

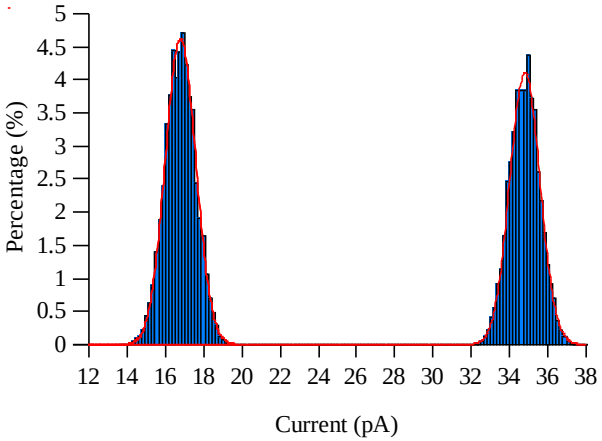
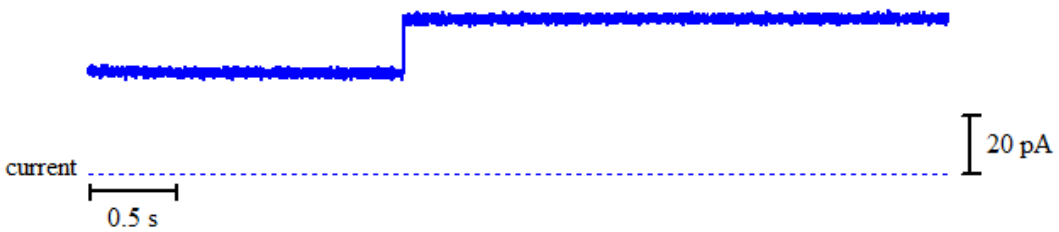


Figure A2 - 194: Above: bilayer activity of **18** with Na^+ ions upon the addition of 75µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 16.78 ± 0.0080 pA and peak 2 = 34.79 ± 0.0089 pA.

Recording 2: 351.00 – 356.00 s



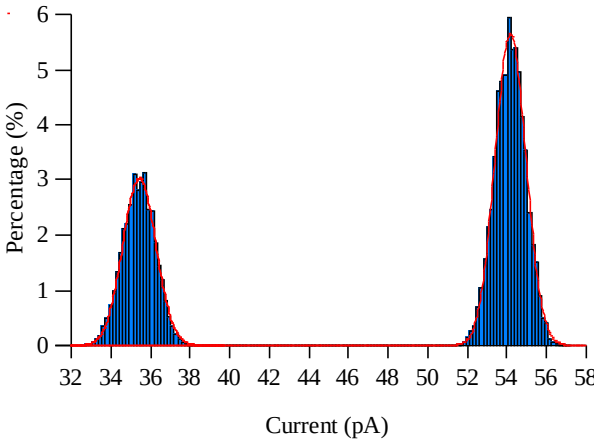
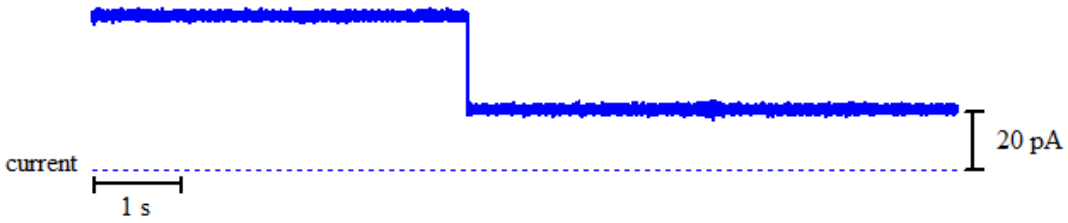


Figure A2 - 195: Above: bilayer activity of **18** with Na^+ ions upon the addition of 75µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 35.43 ± 0.0134 pA and peak 2 = 54.17 ± 0.0071 pA.

Recording 2: 402.00 – 412.00 s



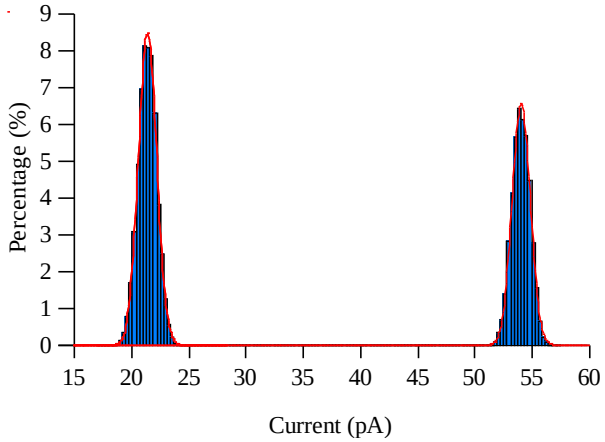


Figure A2 - 196: Above: bilayer activity of **18** with Na^+ ions upon the addition of 100µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 21.39 ± 0.0050 pA and peak 2 = 54.01 ± 0.0064 pA.

Recording 3: 97.00 – 107.00 s

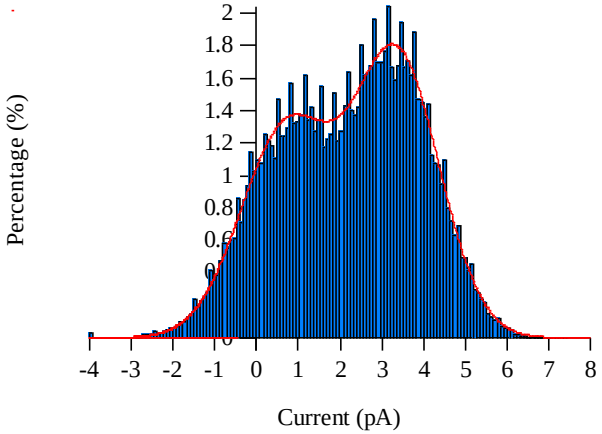


Figure A2 - 197: Above: bilayer activity of **18** with Na^+ ions upon the addition of 25µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.7199 ± 0.0624 pA and peak 2 = 3.36 ± 0.0437 pA.

Recording 3: 133.00 – 138.00 s

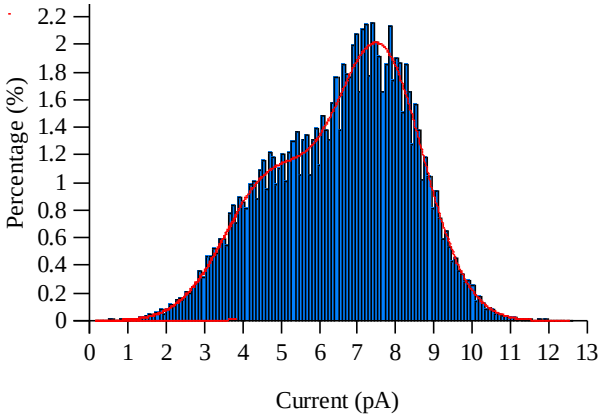
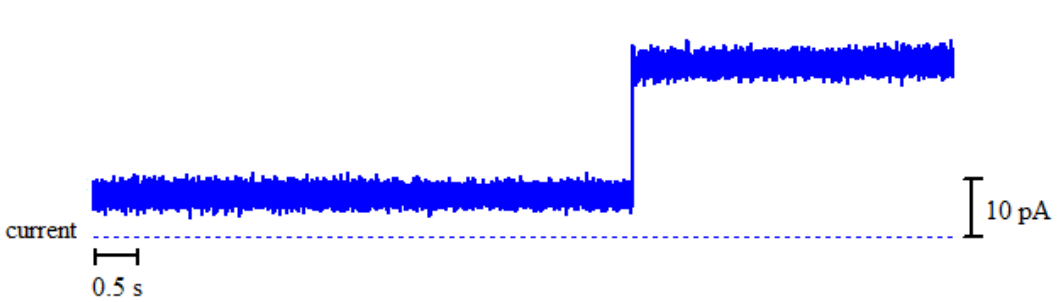


Figure A2 - 198: Above: bilayer activity of **18** with Na^+ ions upon the addition of 25µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 4.70 ± 0.1066 pA and peak 2 = 7.558 ± 0.0527 pA.

Recording 3: 145.50 - 155.50 s



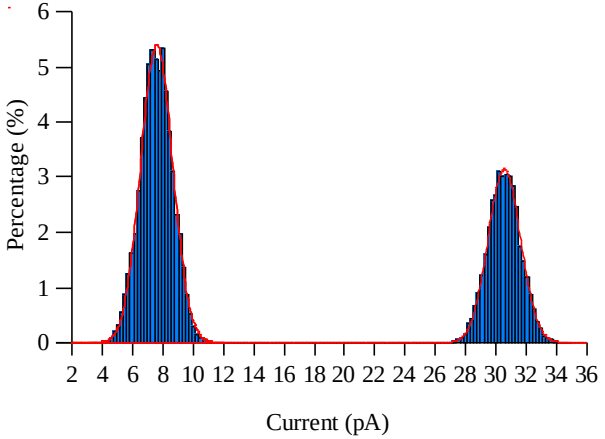
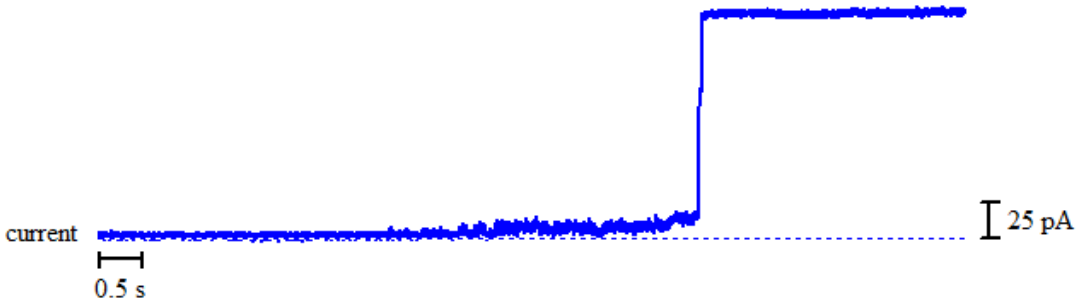


Figure A2 - 199: Above: bilayer activity of **18** with Na^+ ions upon the addition of 25µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 7.59 ± 0.0073 pA and peak 2 = 30.53 ± 0.0125 pA.

Recording 4: 548.00 – 558.00 s



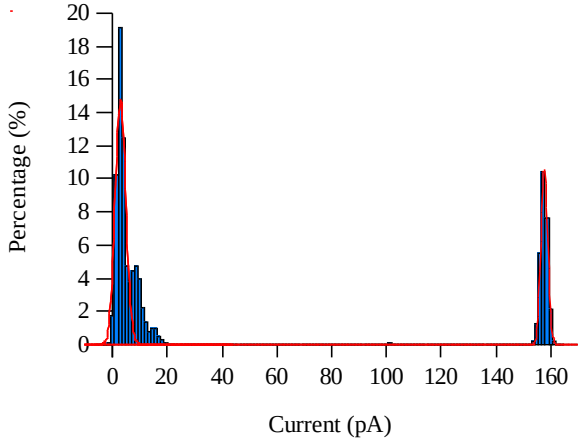
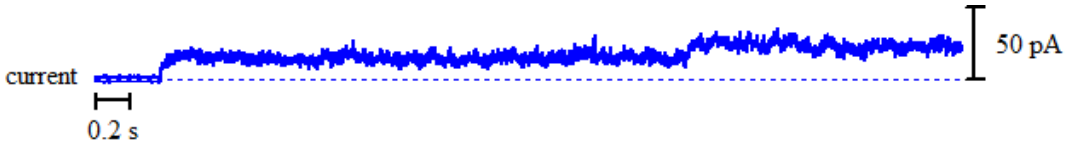


Figure A2 - 200: Above: bilayer activity of **18** with Na^+ ions upon the addition of 125µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 2.911 ± 0.115 pA and peak 2 = 157.6 ± 0.1542 pA.

Planar phospholipid bilayer activity of 18 towards K^+ across the POPE and POPS bilayer system

Recording 1: 441.00 – 446.00 s



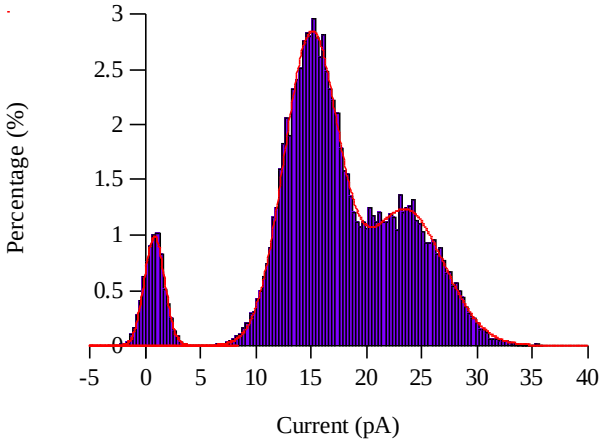
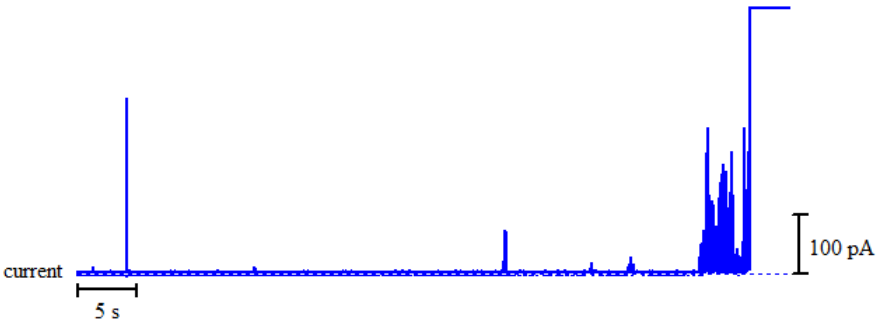


Figure A2 - 201: Above: bilayer activity of **18** with K^+ ions upon the addition of 100µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.8334 ± 0.0347 pA, peak 2 = 14.97 ± 0.0332 pA and peak 3 = 23.45 ± 0.0962 pA.

Recording 2: 655.00 – 715.00 s



Recording 2: 708.00 – 713.00 s

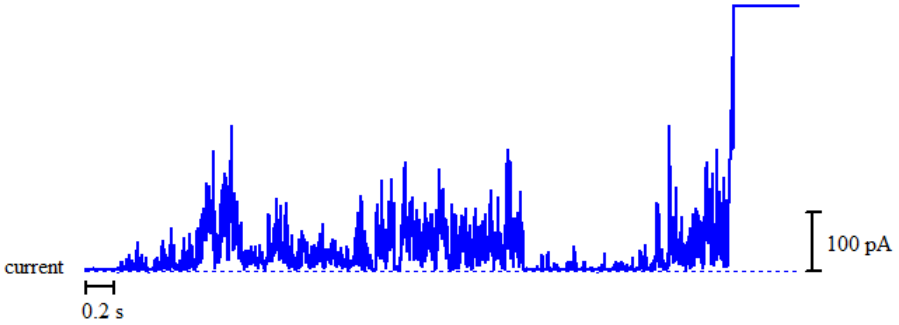
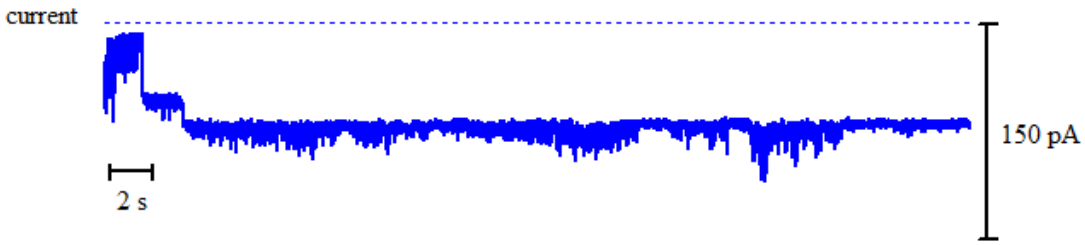


Figure A2 - 202: Bilayer activity of **18** with K^+ ions upon the addition of 150µl (recordings 2) stock solution of **18** in DMSO.

Planar phospholipid bilayer activity of 18 towards Na^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 1293.40 - 1343.40 s



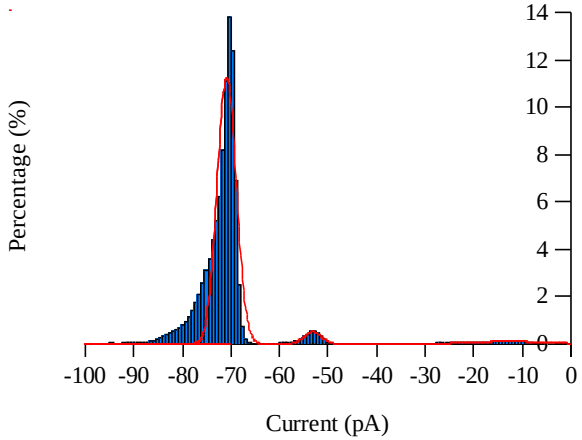
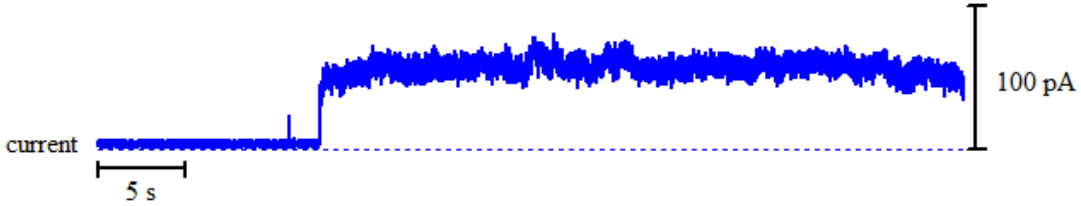


Figure A2 - 203: Above: bilayer activity of **18** with Na^+ ions upon the addition of 200µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = -70.92 ± 0.0794 pA, peak 2 = -53.28 ± 1.748 pA and peak 3 = -12.96 ± 29.58 pA.

Recording 2: 557.00 – 607.00 s



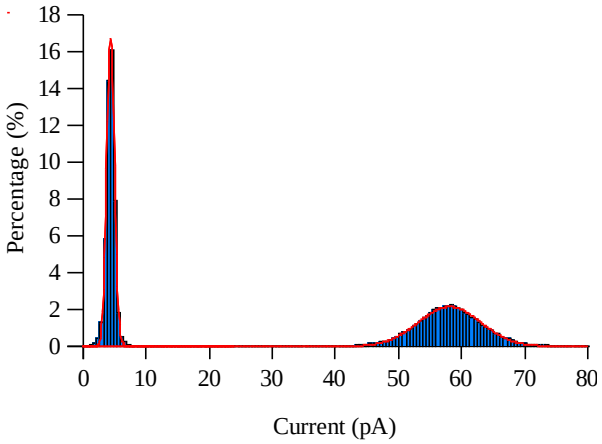


Figure A2 - 204: Above: bilayer activity of **18** with Na^+ ions upon the addition of 125µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 4.324 ± 0.0039 pA and peak 2 = 58.01 ± 0.0625 pA.

Recording 2: 1033.00 – 1083.00 s

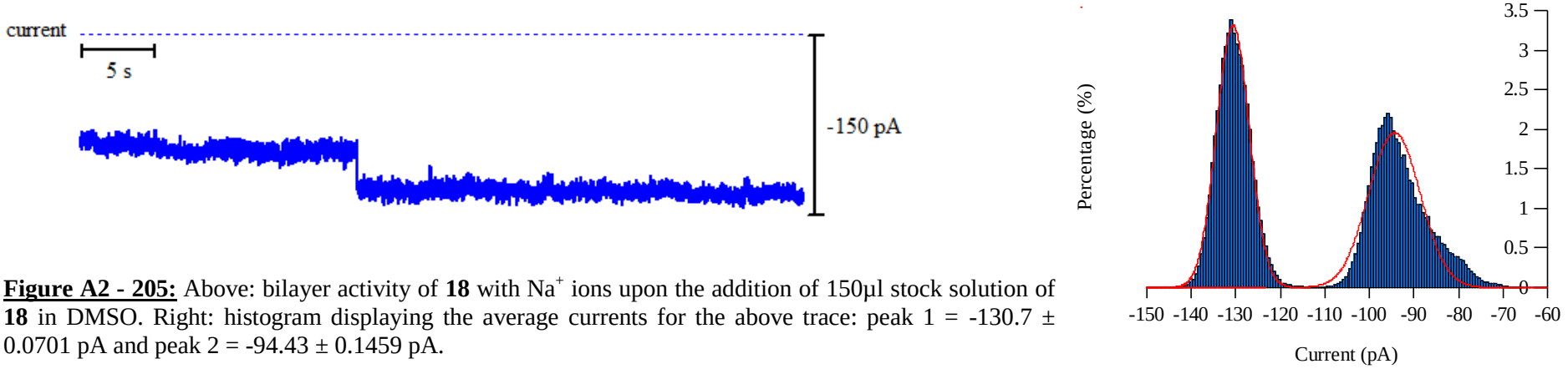


Figure A2 - 205: Above: bilayer activity of **18** with Na^+ ions upon the addition of 150µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = -130.7 ± 0.0701 pA and peak 2 = -94.43 ± 0.1459 pA.

Recording 3: 400.00 – 410.00 s

Recording 3: 1200.00 – 1235.00 s

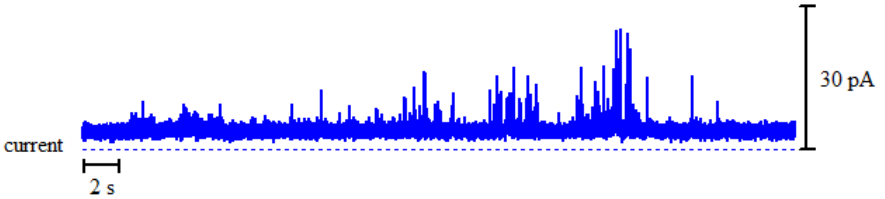
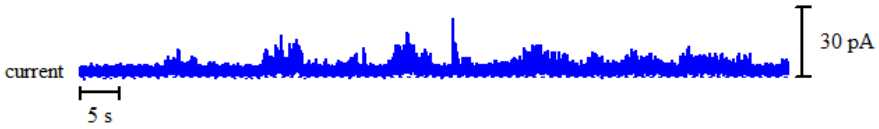
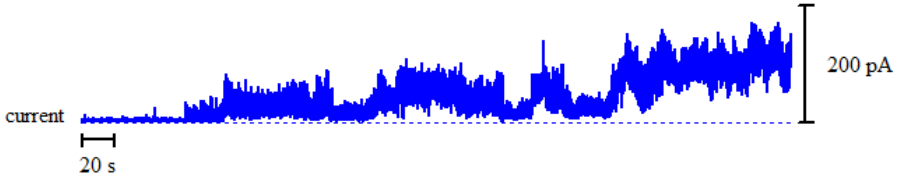


Figure A2 - 206: Bilayer activity of **18** with Na^+ ions upon the addition of 75µl and 200µl (recordings 3) stock solution of **18** in DMSO.

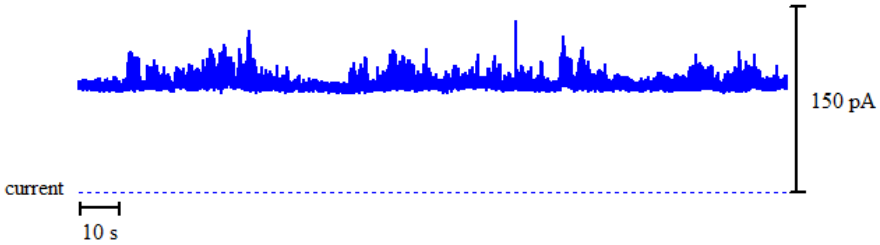
Recording 4: 400.00 – 410.00 s



Recording 4: 1200.00 – 1235.00 s



Recording 4: 1380.00 – 1550.00 s



Recording 5: 984.60 – 1020.00 s

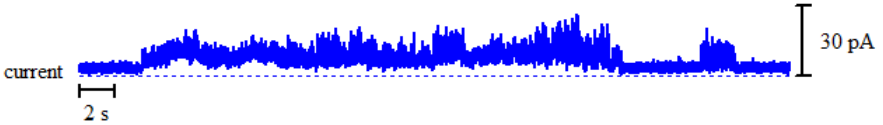
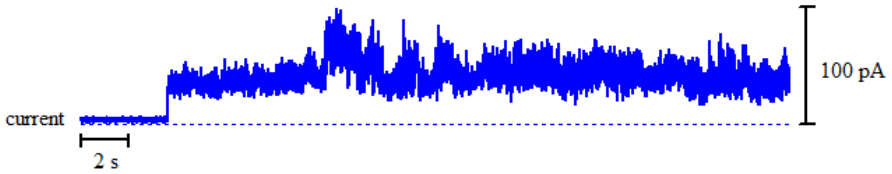


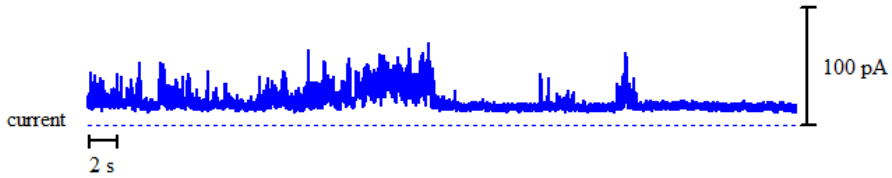
Figure A2 - 207: Bilayer activity of **18** with Na^+ ions upon the addition of 125µl (recording 4- top left), 175µl (recording 4- top right), 200µl (recording 4- bottom left) and 200µl (recording 5) stock solution of **18** in DMSO.

Recording 6: 640.00 – 646.00 s

Recording 6: 800.00 – 830.00 s



Recording 6: 1230.00 – 1375.00 s



Recording 7: 801.00 – 803.00 s

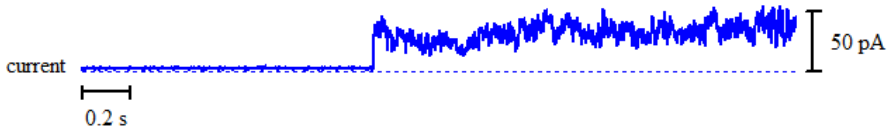
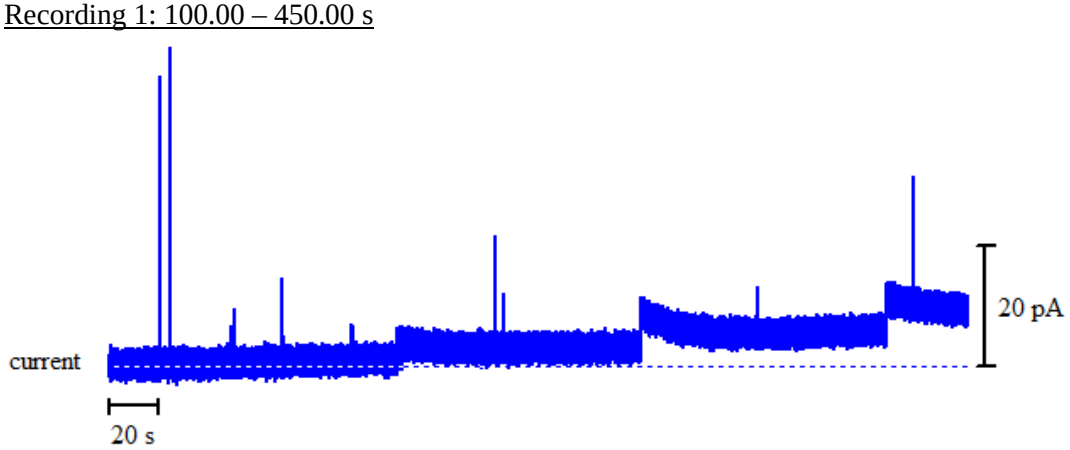


Figure A2 - 208: Bilayer activity of **18** with Na^+ ions upon the addition of 150µl (recording 6- top left), 175µl (recording 6- top right), 200µl (recording 6- bottom left) and 175µl (recording 7) stock solution of **18** in DMSO.

Planar phospholipid bilayer activity of 18 towards K^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 100.00 – 450.00 s



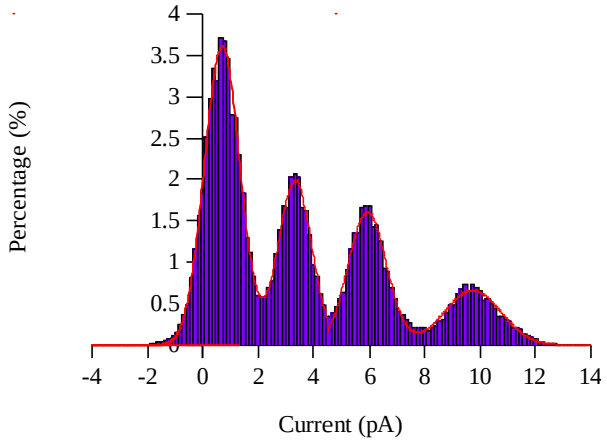
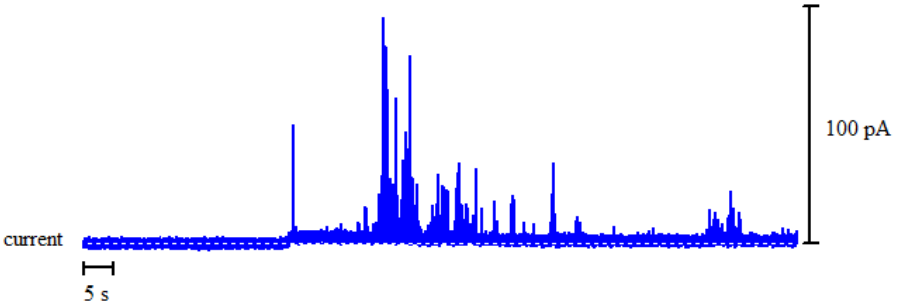


Figure A2 - 209: Above: bilayer activity of **18** with K^+ ions upon the addition of 25µl, 50µl, 75µl and 100µl stock solution of **18** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 0.7004 ± 0.0089 pA, peak 2 = 3.335 ± 0.0156 pA, peak 3 = 5.908 ± 0.0110 pA and peak 4 = 9.708 ± 0.0316 pA.

Recording 2: 80.00 – 180.00 s

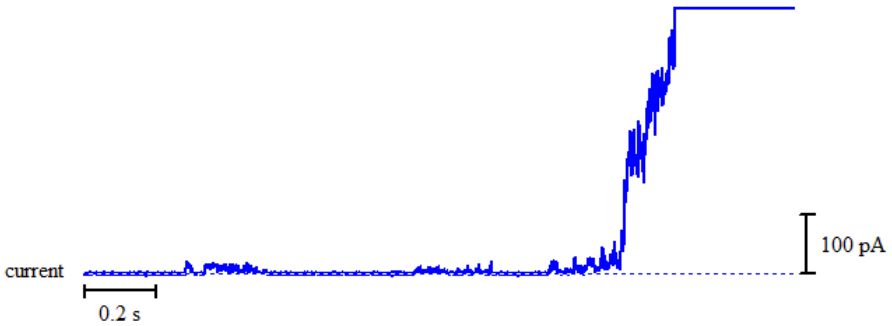


Recording 3: 480.00 – 580.00 s

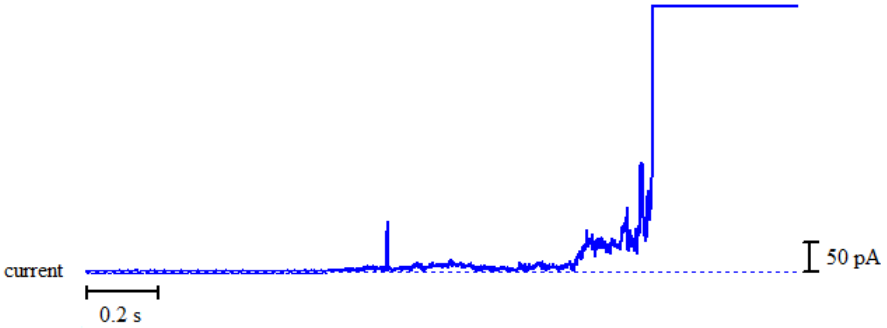
Figure A2 - 210: Bilayer activity of **18** with K^+ ions upon the addition of 25µl (recording 2) and 125ul (recording 3) stock solution of **18** in DMSO.

Planar phospholipid bilayer activity of 19 towards Na^+ across the POPE and POPS bilayer system

Recording 1: 147.80 – 149.80 s



Recording 2: 326.60 – 328.40 s



Recording 3: 506.00 – 516.00 s

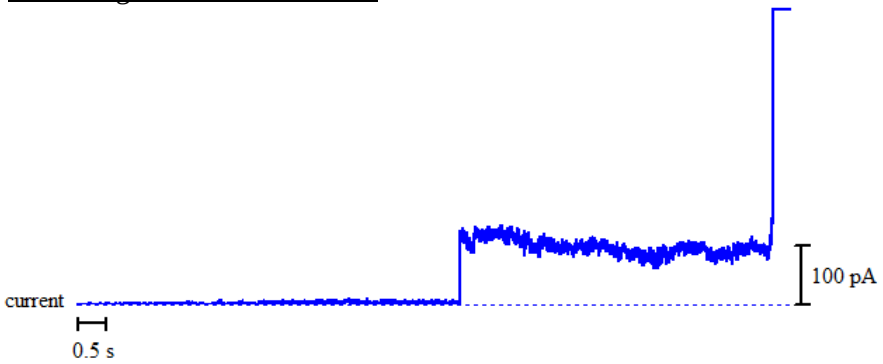
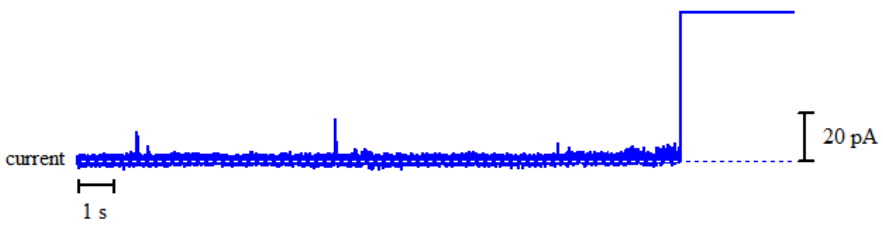


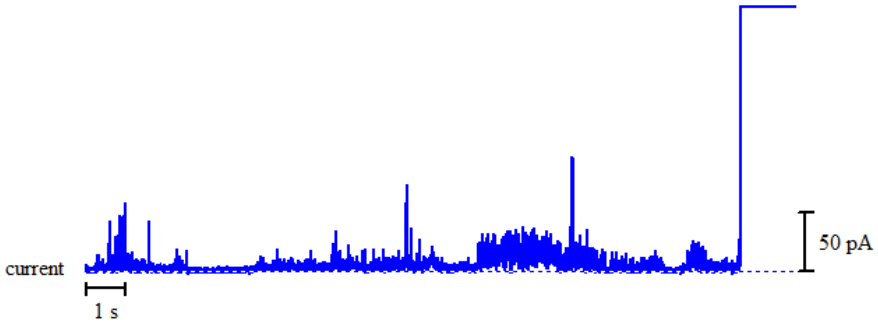
Figure A2 - 211: Bilayer activity of **19** with Na^+ ions upon the addition of 25µl (recording 1), 75ul (recording 2) and 125ul (recording 3) stock solution of **19** in DMSO.

Planar phospholipid bilayer activity of 19 towards K^+ across the POPE and POPS bilayer system

Recording 1: 390.00 – 409.00 s



Recording 2: 408.00 – 428.00 s



Recording 3: 519.00 – 522.00 s

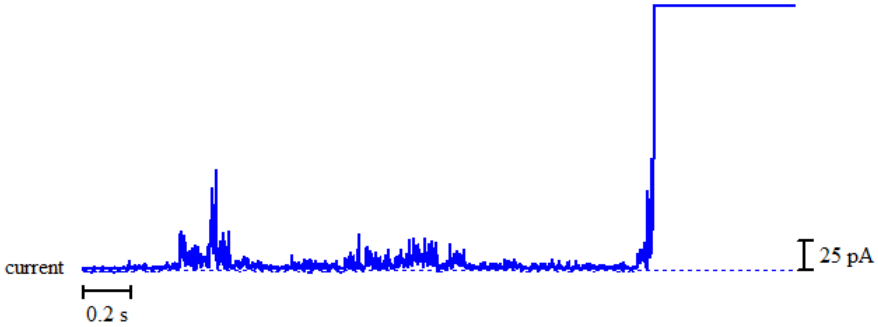
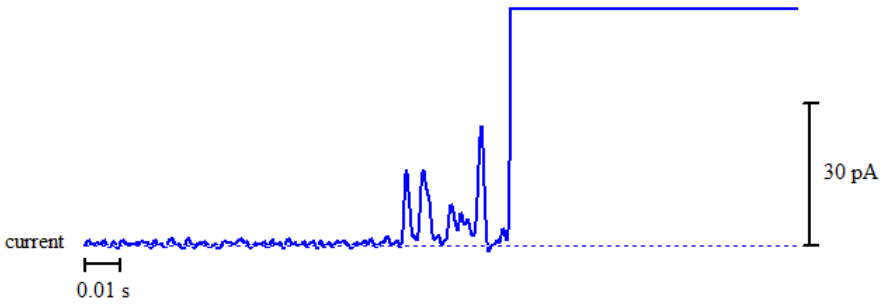


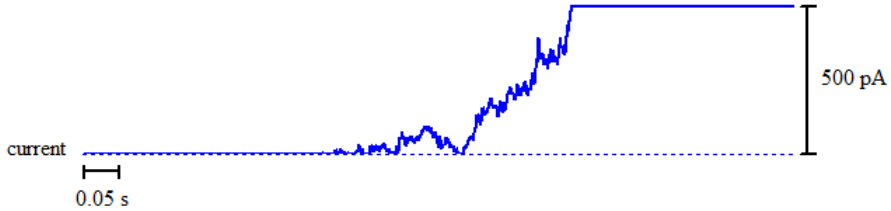
Figure A2 - 212: Bilayer activity of **19** with K^+ ions upon the addition of 75µl (recording 1), 100µl (recording 2) and 125ul (recording 3) stock solution of **19** in DMSO.

Planar phospholipid bilayer activity of 18 towards Na^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 101.78 – 101.88 s



Recording 2: 119.48 – 119.81 s



Recording 3: 252.30 – 253.50 s

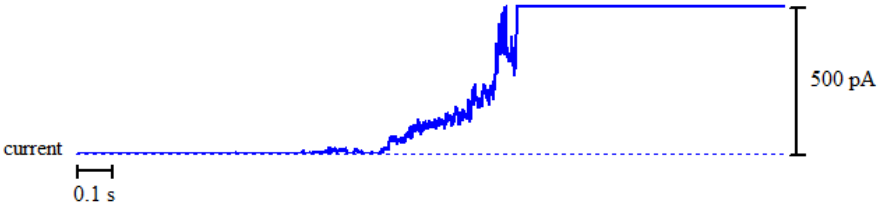
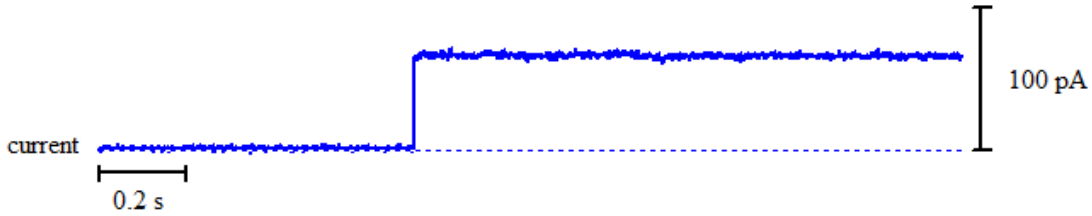


Figure A2 - 213: Bilayer activity of **19** with Na^+ ions upon the addition of 25µl (recordings 1 and 2) and 50ul (recording 3) stock solution of **19** in DMSO.

Planar phospholipid bilayer activity of 18 towards K^+ across the DLPE, DLPS and cholesterol bilayer system

Recording 1: 697.00 – 702.00 s



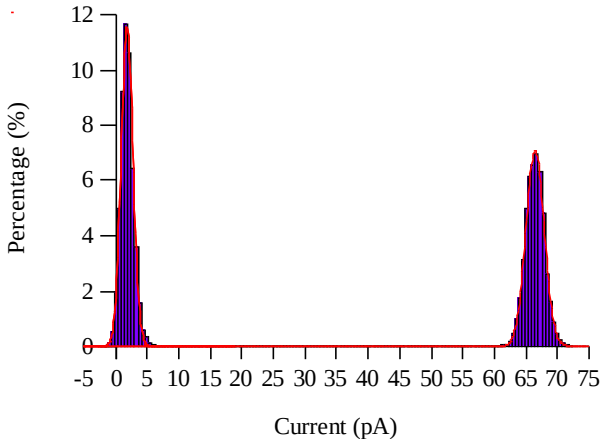
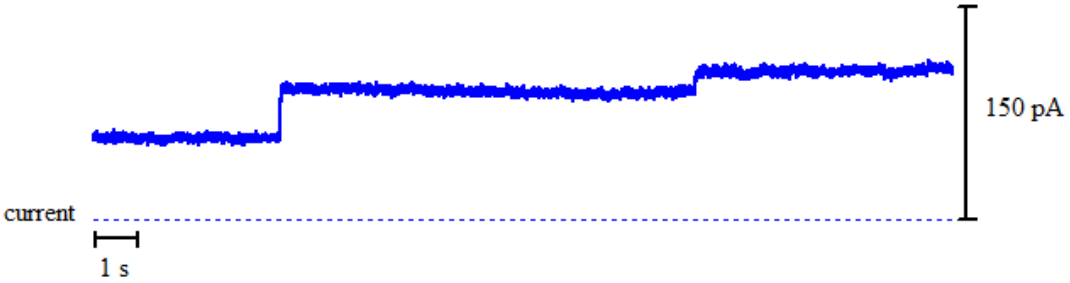


Figure 3.2.70: Above: bilayer activity of **19** with K^+ ions upon the addition of 175µl stock solution of **19** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 1.791 ± 0.0079 pA and peak 2 = 66.43 ± 0.0149 pA.

Recording 2: 806.00 – 826.00 s



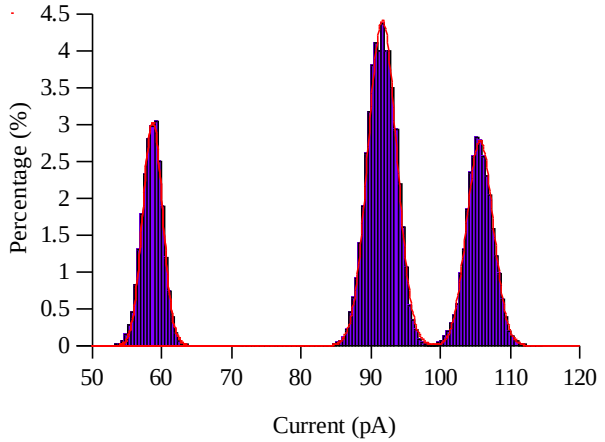
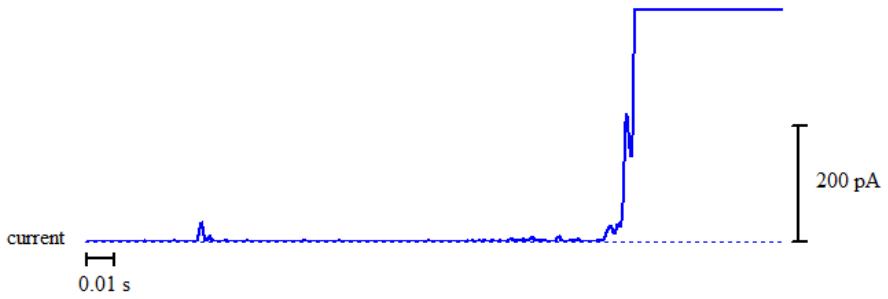
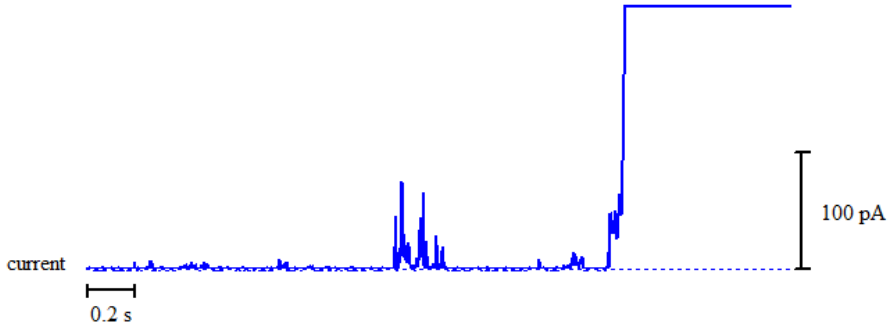


Figure A2 - 214: Above: bilayer activity of **19** with K^+ ions upon the addition of 175µl stock solution of **19** in DMSO. Right: histogram displaying the average currents for the above trace: peak 1 = 58.64 ± 0.0202 pA, peak 2 = 91.63 ± 0.0172 pA and peak 3 = 105.7 ± 0.0265 pA.

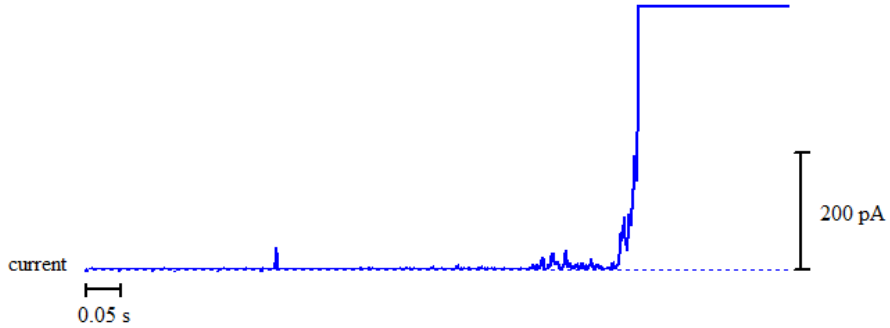
Recording 3: 122.00 – 122.50 s



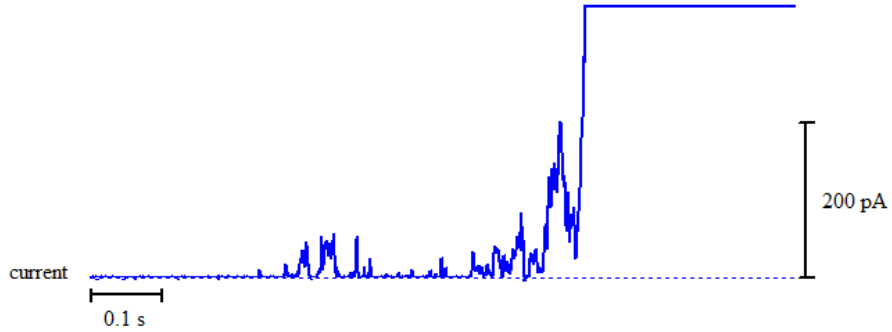
Recording 4: 141.00 – 144.00 s



Recording 5: 124.50 – 125.00 s



Recording 6: 222.00 – 223.00 s



Recording 7: 206.50 – 209.50 s

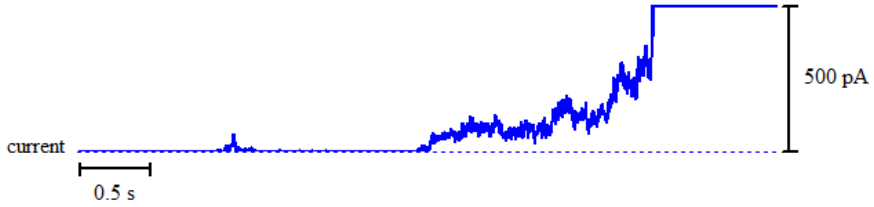


Figure A2 - 215: Bilayer activity of **19** with K^+ ions upon the addition of 25µl (recordings 3, 4 and 5) and 50ul (recordings 6 and 7) stock solution of **19** in DMSO.

Rationale

1 amp = 1 coulomb charge/sec
1 mole of Na^+ ions = 96,458 coulombs (Faraday's constant)
1 mole of Na^+ ions = 6.022×10^{23} ions (Avogadro's constant)

Channel current = 96,458 amps = 96,458 coulombs = 1 mole = 6.022×10^{23} Na^+ ions flowing through the channel per second.

Calculation – worked example (Figure A2 – 1)

Reading from experiment: 89.910 pA - 5.285 pA = 84.625 pA = **8.4625×10^{-11} amps**
8.4625×10^{-11} amps = **8.4625×10^{-11} coulombs/second**

Ratio for the number of moles of Na^+ ions:

Since 1 mole of Na^+ ions = 96,458 coulombs
x = 8.4625×10^{-11} coulombs/second

Where x is equal to the number of moles of Na^+ ions to be found

$$\frac{1}{96{,}458} = 1.03672 \times 10^{-5}$$

Number of moles of Na^+ ions = $1.03672 \times 10^{-5} \times 8.4625 \times 10^{-11}$ coulombs/second
Number of moles of Na^+ ions = 8.7732×10^{-16}

Ratio for the number of Na^+ ions flowing per second:

Since 1 mole of Na^+ ions = 6.022×10^{23} ions (Avogadro's constant)
x moles of Na^+ ions = 8.7732×10^{-16} coulombs/sec
where x is equal to the number of ions flowing per second

$$\frac{6.022 \times 10^{23} \text{ ions}}{1 \text{ mole}} = 6.022 \times 10^{23}$$

x Na^+ ions/sec = $6.022 \times 10^{23} \times 8.7732 \times 10^{-16}$ coulombs/sec

Na^+ ions/sec = 528325022.3 ions flowing per second

Na^+ ions/sec = 5.28×10^8 ions flowing per second

Calculation A2 - 1: Calculation to determine the number of ions flowing across the bilayer membrane per second based from the current produced.

Table A2 - 1: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **8** across the POPE and POPS bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **8**					Compound **8**				
Conductance (pS)					**Current (pA)**				
Li^+	Na^+	K^+	Rb^+	Cs^+	Li^+	Na^+	K^+	Rb^+	Cs^+
45.68	1692.50	374.28		0.00	2.28	84.63	18.71		0.00
0.00	1384.00	124.00		0.00	0.00	69.20	6.20		0.00
0.00	300.84	0.00		0.00	0.00	15.04	0.00		0.00
0.00	1941.00	0.00		0.00	0.00	97.05	0.00		0.00
	336.00	0.00		0.00		16.80	0.00		0.00
	2512.26	0.00		0.00		125.61	0.00		0.00
	209.96	0.00				10.50	0.00		0.00
	567.47	0.00				28.37	0.00		
	0.00	0.00				0.00	0.00		
	0.00	0.00				0.00	0.00		
	0.00	0.00				0.00	0.00		
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			

	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			

	Li^+	**Na^+**	**K^+**	**Rb^+**	**Cs^+**
Average Conductance (pS)	45.68	1118.00	249.14	N/a	0.00
Average Current (pA)	2.28	55.90	12.46	N/a	0.00
Average ion flow rate (ions/second)	14259303.99	348991938.80	77770643.50	N/a	0.000

Table A2 - 2: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **8** across the DLPE, DLPS and cholesterol bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **8**					Compound **8**				
Conductance (pS)					**Current (pA)**				
Li^+	Na^+	K^+	Rb^+	Cs^+	Li^+	Na^+	K^+	Rb^+	Cs^+
57.33	197.37	41.35	547.30	139.02	2.87	9.87	2.07	27.37	6.95
0.00	62.63	43.57	139.20	85.48	0.00	11.90	2.18	6.96	4.27
0.00	263.40	2893.14	356.80	44.78	0.00	13.17	144.66	17.84	2.24
0.00	71.05	0.00	137.80	1598.62	0.00	5.68	0.00	6.89	79.93
0.00	80.32	0.00	142.80	0.00	0.00	4.02	0.00	7.14	0.00
0.00	80.32	0.00	258.00	0.00	0.00	4.02	0.00	12.90	0.00
0.00	69.80	0.00	532.58	0.00	0.00	3.49	0.00	26.63	0.00
	50.14	0.00	0.00			2.51	0.00	0.00	
	409.14	0.00	0.00			20.46	0.00	0.00	
	188.57	0.00	0.00			9.43	0.00	0.00	
	643.60	0.00	0.00			32.18	0.00	0.00	
	689.20	0.00	0.00			34.46	0.00	0.00	
	625.17	0.00	0.00			31.26	0.00	0.00	
	3216.50		0.00			257.32		0.00	
	3585.00					143.40			
	4078.00					203.90			
	2414.00					120.70			
	4230.00					211.50			
	2708.60					135.43			
	1349.80					67.49			

	1396.00					69.80			
	838.00					41.90			
	382.00					19.10			
	1496.00					74.80			
	926.00					46.30			
	1086.07					54.30			
	914.14					45.71			
	1208.98					60.45			
	280.20					14.01			
	379.00					18.95			
	538.00					26.90			
	151.20					7.56			
	278.80					13.94			
	253.40					12.67			
	268.00					13.40			
	1053.06					52.65			
	1066.52					53.33			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			

	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			
	0.00					0.00			

	Li^+	**Na^+**	**K^+**	**Rb^+**	**Cs^+**
Average Conductance (pS)	57.33	1014.27	992.69	302.07	466.98
Average Current (pA)	2.87	52.65	49.63	15.10	23.35
Average ion flow rate (ions/second)	17897174.58	328682828.80	309873904.50	94292635.39	145769231.20

Table A2 - 3: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **9** across the POPE and POPS bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **9**	
Conductance (pS)	
Na^+	K^+
2425.90	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	

Compound **9**	
Current (pA)	
Na^+	K^+
121.30	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	

	Na^+	**K^+**
Average Conductance (pS)	2425.90	N/a
Average Current (pA)	121.30	N/a
Average ion flow rate (ions/second)	757260191.35	0.00

Table A2 - 4: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **9** across the DLPE, DLPS and cholesterol bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **9**	
Conductance (pS)	
Na^+	K^+
2196.40	0.00
361.00	0.00
202.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00

Compound **9**	
Current (pA)	
Na^+	K^+
109.82	0.00
18.05	0.00
10.10	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00

	Na^+	**K^+**
Average Conductance (pS)	919.80	0.00
Average Current (pA)	45.99	0.00
Average ion flow rate (ions/second)	287121449.40	0.00

Table A2 - 5: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **10** across the POPE and POPS bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **10**	
Conductance (pS)	
Na^+	K^+
1155.84	3619.36
366.00	3374.00
299.40	546.00
828.00	546.00
0.00	7194.70
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	
0.00	

Compound **10**	
Current (pA)	
Na^+	K^+
57.79	180.97
18.30	168.70
14.97	27.30
41.40	27.30
0.00	359.74
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	
0.00	

	Na^+	**K^+**
Average Conductance (pS)	662.31	3056.01
Average Current (pA)	33.12	152.80
Average ion flow rate (ions/second)	206744300.00	953953679.80

Table A2 - 5: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **10** across the DLPE, DLPS and cholesterol bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **10**	
Conductance (pS)	
Na^+	K^+
1068.34	0.00
226.60	0.00
192.40	0.00
68.17	0.00
969.44	0.00
871.60	0.00
1112.40	0.00
3604.00	0.00
2098.00	
588.58	
2254.00	
1950.00	
1128.00	
1512.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.000	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	

Compound **10**	
Current (pA)	
Na^+	K^+
53.42	0.00
11.33	0.00
9.62	0.00
3.41	0.00
48.47	0.00
43.58	0.00
55.62	0.00
180.20	0.00
104.90	
29.43	
112.70	
97.50	
56.40	
75.60	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	

	Na^+	**K^+**
Average Conductance (pS)	1260.25	0.00
Average Current (pA)	63.01	0.00
Average ion flow rate (ions/second)	393395806.50	0.00

Table A2 - 6: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **11** across the POPE and POPS bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **11**	
Conductance (pS)	
Na^+	K^+

Compound **11**	
Current (pA)	
Na^+	K^+

	Na^+	**K^+**
Average Conductance (pS)	N/a	N/a
Average Current (pA)	N/a	N/a
Average ion flow rate (ions/second)	N/a	N/a

Table A2 - 7: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **11** across the DLPE, DLPS and cholesterol bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **11**	
Conductance (pS)	
Na^+	K^+
88.56	301.80
135.88	0.00
62.88	0.00
178.80	0.00
104.20	0.00
93.26	0.00
77.26	0.00
90.12	0.00
28.86	0.00
27.70	
58.98	
34.82	
151.70	
31.00	
36.80	
105.10	
74.36	
103.20	
32.75	
281.33	
302.20	
49.20	
0.00	
0.00	
0.00	
0.00	
0.00	

Compound **11**	
Current (pA)	
Na^+	K^+
4.43	15.09
6.79	0.00
3.14	0.00
8.94	0.00
5.21	0.00
4.66	0.00
3.86	0.00
4.51	0.00
1.44	0.00
1.39	
2.95	
1.74	
7.59	
1.55	
1.84	
5.26	
3.72	
5.16	
2.62	
25.32	
15.11	
2.46	
0.00	
0.00	
0.00	
0.00	
0.00	

	Na^+	**K^+**
Average Conductance (pS)	108.80	301.80
Average Current (pA)	5.44	15.09
Average ion flow rate (ions/second)	33963750.56	94208799.11

Table A2 - 8: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **12** across the POPE and POPS bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **12**	
Conductance (pS)	
Na^+	K^+
190.12	
396.20	
608.60	
1280.80	
1652.00	
219.26	
7670.60	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	

Compound **12**	
Current (pA)	
Na^+	K^+
9.51	
19.81	
30.43	
64.04	
82.60	
10.96	
383.53	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	
0.00	

	Na^+	**K^+**
Average Conductance (pS)	1716.80	N/a
Average Current (pA)	85.84	N/a
Average ion flow rate (ions/second)	535909201.90	N/a

Table A2 - 9: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **12** across the DLPE, DLPS and cholesterol bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **12**	
Conductance (pS)	
Na^+	K^+
0.00	3716.18
0.00	938.00
0.00	330.00
0.00	198.00
0.00	742.40
0.00	1461.04
0.00	221.78
0.00	69.96
	69.96
	408.88
	161.52
	161.52
	343.48
	181.96
	247.36
	247.36
	161.52
	408.88
	166.60
	90.00
	90.00
	377.20
	312.20
	158.60
	0.00
	0.00
	0.00
	0.00
	0.00
	0.00

Compound **12**	
Current (pA)	
Na^+	K^+
0.00	185.81
0.00	46.90
0.00	16.50
0.00	9.90
0.00	37.12
0.00	73.05
0.00	11.09
0.00	3.50
	3.50
	20.44
	8.08
	8.08
	17.17
	9.10
	12.37
	12.37
	8.08
	20.44
	8.33
	4.50
	4.50
	18.86
	15.61
	7.93
	0.00
	0.00
	0.00
	0.00
	0.00
	0.00

	Na^+	**K^+**
Average Conductance (pS)	0.00	469.35
Average Current (pA)	0.00	23.47
Average ion flow rate (ions/second)	0.00	146510602.60

Table A2 - 10: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **13** across the POPE and POPS bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **13**	
Conductance (pS)	
Na^+	K^+

Compound **13**	
Current (pA)	
Na^+	K^+

	Na^+	**K^+**
Average Conductance (pS)	N/a	N/a
Average Current (pA)	N/a	N/a
Average ion flow rate (ions/second)	N/a	N/a

Table A2 - 11: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **13** across the DLPE, DLPS and cholesterol bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **13**	
Conductance (pS)	
Na^+	K^+
252.73	695.82
88.40	1522.00
89.46	432.60
118.82	230.00
191.42	152.00
786.46	83.00
364.80	53.80
0.00	106.40
0.00	171.20
0.00	0.00
0.00	0.00
0.00	0.00
	0.00
	0.00
	0.00
	0.00

Compound **13**	
Current (pA)	
Na^+	K^+
12.64	34.79
4.42	76.10
4.47	21.63
5.94	11.50
9.57	7.60
39.32	4.15
18.24	2.69
0.00	5.32
0.00	8.56
0.00	0.00
0.00	0.00
0.00	0.00
	0.00
	0.00
	0.00
	0.00

	Na^+	**K^+**
Average Conductance (pS)	270.30	382.98
Average Current (pA)	13.51	19.15
Average ion flow rate (ions/second)	84375516.01	119549655.01

Table A2 - 12: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **14** across the POPE and POPS bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **14**	
Conductance (pS)	
Na^+	K^+
352.14	3808.48
350.16	8681.84
360.08	1050.40
364.34	0.00
6394.20	0.00
324.00	
292.96	
290.92	
7810.40	
73.84	
297.34	
338.95	
1541.71	
2766.00	
0.00	
0.00	
0.00	
0.00	

Compound **14**	
Current (pA)	
Na^+	K^+
17.61	190.42
17.51	434.09
18.00	52.52
18.22	0.00
319.71	0.00
16.20	
14.65	
14.55	
390.52	
3.69	
14.87	
16.95	
77.09	
138.30	
0.00	
0.00	
0.00	
0.00	

	Na^+	**K^+**
Average Conductance (pS)	1539.79	4513.57
Average Current (pA)	76.99	225.68
Average ion flow rate (ions/second)	480654800.30	1408941182.97

Table A2 - 13: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **14** across the DLPE, DLPS and cholesterol bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **14**	
Conductance (pS)	
Na^+	K^+
243.58	108.03
773.40	51.94
1819.00	0.00
126.00	0.00
254.00	0.00
138.00	0.00
340.00	0.00
207.20	0.00
201.25	
238.80	
77.80	
77.80	
139.60	
154.54	
0.00	
0.00	
0.00	
0.00	
0.00	

Compound **14**	
Current (pA)	
Na^+	K^+
12.18	5.40
38.67	2.60
90.95	0.00
6.30	0.00
12.70	0.00
6.90	0.00
17.00	0.00
10.36	0.00
8.05	
11.94	
3.89	
3.89	
6.98	
7.73	
0.00	
0.00	
0.00	
0.00	
0.00	

	Na^+	**K^+**
Average Conductance (pS)	342.21	79.99
Average Current (pA)	16.97	4.00
Average ion flow rate (ions/second)	105926258.19	24968141.17

Table A2 - 14: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **15** across the POPE and POPS bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **15**	
Conductance (pS)	
Na^+	K^+
2028.80	213.48
445.70	219.63
279.94	450.72
3532.80	299.20
1321.57	0.00
0.00	0.00
0.00	0.00
0.00	0.00
	0.00

Compound **15**	
Current (pA)	
Na^+	K^+
101.44	10.67
22.29	10.98
14.00	22.54
176.64	14.96
66.08	0.00
0.00	0.00
0.00	0.00
0.00	0.00
	0.00

	Na^+	**K^+**
Average Conductance (pS)	1521.76	295.76
Average Current (pA)	76.09	14.79
Average ion flow rate (ions/second)	475027735.40	92323062.34

Table A2 - 15: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **15** across the DLPE, DLPS and cholesterol bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **15**	
Conductance (pS)	
Na^+	K^+
202.68	2777.20
210.80	2777.20
232.20	2777.20
0.00	2777.20
0.00	1665.20
0.00	1112.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
	0.00
	0.00
	0.00

Compound **15**	
Current (pA)	
Na^+	K^+
10.13	138.86
10.54	138.86
11.61	138.86
0.00	138.86
0.00	83.26
0.00	55.60
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
	0.00
	0.00
	0.00

	Na^+	**K^+**
Average Conductance (pS)	215.23	2314.33
Average Current (pA)	10.76	115.72
Average ion flow rate (ions/second)	67184379.73	722433943.22

Table A2 - 16: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **16** across the POPE and POPS bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **16**	
Conductance (pS)	
Na^+	K^+
450.78	457.41
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	
0.00	
0.00	

Compound **16**	
Current (pA)	
Na^+	K^+
22.54	22.87
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	
0.00	
0.00	

	Na^+	**K^+**
Average Conductance (pS)	450.78	457.41
Average Current (pA)	22.54	22.87
Average ion flow rate (ions/second)	140715107.01	142782206.64

Table A2 - 17: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **16** across the DLPE, DLPS and cholesterol bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **16**	
Conductance (pS)	
Na^+	K^+
1646.37	0.00
53.20	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	
0.00	

Compound **16**	
Current (pA)	
Na^+	K^+
82.32	0.00
2.66	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	
0.00	

	Na^+	**K^+**
Average Conductance (pS)	849.78	0.00
Average Current (pA)	42.49	0.00
Average ion flow rate (ions/second)	265265195.26	0.00

Table A2 - 18: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **17** across the POPE and POPS bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **17**	
Conductance (pS)	
Na^+	K^+
164.72	0.00
0.00	0.00
0.00	0.00
	0.00
	0.00
	0.00
	0.00
	0.00
	0.00
	0.00
	0.00

Compound **17**	
Current (pA)	
Na^+	K^+
8.24	0.00
0.00	0.00
0.00	0.00
	0.00
	0.00
	0.00
	0.00
	0.00
	0.00
	0.00
	0.00

	Na^+	**K^+**
Average Conductance (pS)	164.72	0.00
Average Current (pA)	8.24	0.00
Average ion flow rate (ions/second)	51417776.58	0

Table A2 - 19: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **17** across the DLPE, DLPS and cholesterol bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **17**	
Conductance (pS)	
Na^+	K^+
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	
0.00	

Compound **17**	
Current (pA)	
Na^+	K^+
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	
0.00	

	Na^+	**K^+**
Average Conductance (pS)	0.00	0.00
Average Current (pA)	0.00	0.00
Average ion flow rate (ions/second)	0.00	0.00

Table A2 - 20: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **18** across the POPE and POPS bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **18**	
Conductance (pS)	
Na^+	K^+
1076.57	282.73
913.70	169.60
55.60	0.00
91.94	0.00
292.16	0.00
360.20	0.00
374.80	0.00
652.40	0.00
52.80	0.00
458.80	0.00
3093.78	
0.00	
0.00	
0.00	
0.00	

Compound **18**	
Current (pA)	
Na^+	K^+
53.83	14.14
45.69	8.48
2.78	0.00
4.60	0.00
14.61	0.00
18.01	0.00
18.74	0.00
32.62	0.00
2.64	0.00
22.94	0.00
154.69	
0.00	
0.00	
0.00	
0.00	

	Na^+	**K^+**
Average Conductance (pS)	674.80	226.17
Average Current (pA)	33.74	11.31
Average ion flow rate (ions/second)	210641657.67	70599162.55

Table A2 - 21: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **18** across the DLPE, DLPS and cholesterol bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **18**	
Conductance (pS)	
Na^+	K^+
806.40	52.69
352.80	51.46
1073.72	76.00
725.40	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
	0.00

Compound **18**	
Current (pA)	
Na^+	K^+
40.32	2.64
17.64	2.57
53.69	3.80
36.27	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
	0.00

	Na^+	**K^+**
Average Conductance (pS)	739.58	60.05
Average Current (pA)	36.98	3.00
Average ion flow rate (ions/second)	230864624.40	18745199.44

Table A2 - 22: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **19** across the POPE and POPS bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **19**	
Conductance (pS)	
Na^+	K^+
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
	0.00

Compound **19**	
Current (pA)	
Na^+	K^+
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
	0.00

	Na^+	**K^+**
Average Conductance (pS)	0.00	0.00
Average Current (pA)	0.00	0.00
Average ion flow rate (ions/second)	0.00	0.00

Table A2 - 23: A table showing the raw data for Conductance (pS) and Current (pA) obtained for **19** across the DLPE, DLPS and cholesterol bilayer system and the calculated average rate of ions per second (coulombs/second) of each ion respectively.

Compound **19**	
Conductance (pS)	
Na^+	K^+
0.00	1292.78
0.00	659.80
0.00	281.40
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
	0.00

Compound **19**	
Current (pA)	
Na^+	K^+
0.00	64.64
0.00	32.99
0.00	14.07
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
	0.00

	Na^+	**K^+**
Average Conductance (pS)	0.00	744.66
Average Current (pA)	0.00	37.23
Average ion flow rate (ions/second)	0.00	232450378.87

Appendix III

Antimicrobial susceptibility testing

	Microorganism			
Compound	***E. coli***	***S. aureus***	***P. aeruginosa***	***S. pyogenes***
8	-	-	-	-
9	-	-	-	-
10	-	-	-	-
11	9.33	8.50	8.00	22.16
12	9.60	-	-	-
13	-	-	-	8.33
14	16.16	-	15.67	-
15	18.50	17.30	-	-
16	-	-	-	-
17	16.50	12.16	17.00	25.00
18	11.67	22.33	10.00	54.33
19	9.00	7.67	10.83	16.00

Table A3 – 1: The average diameter (mm) of microbial inhibition zones produced upon contact with compounds **8-19**.