

Plate 1: ^1H NMR spectrum of pyridyl[1,5-*a*]-4-phenylimidazolium chloride (**4.3a**)

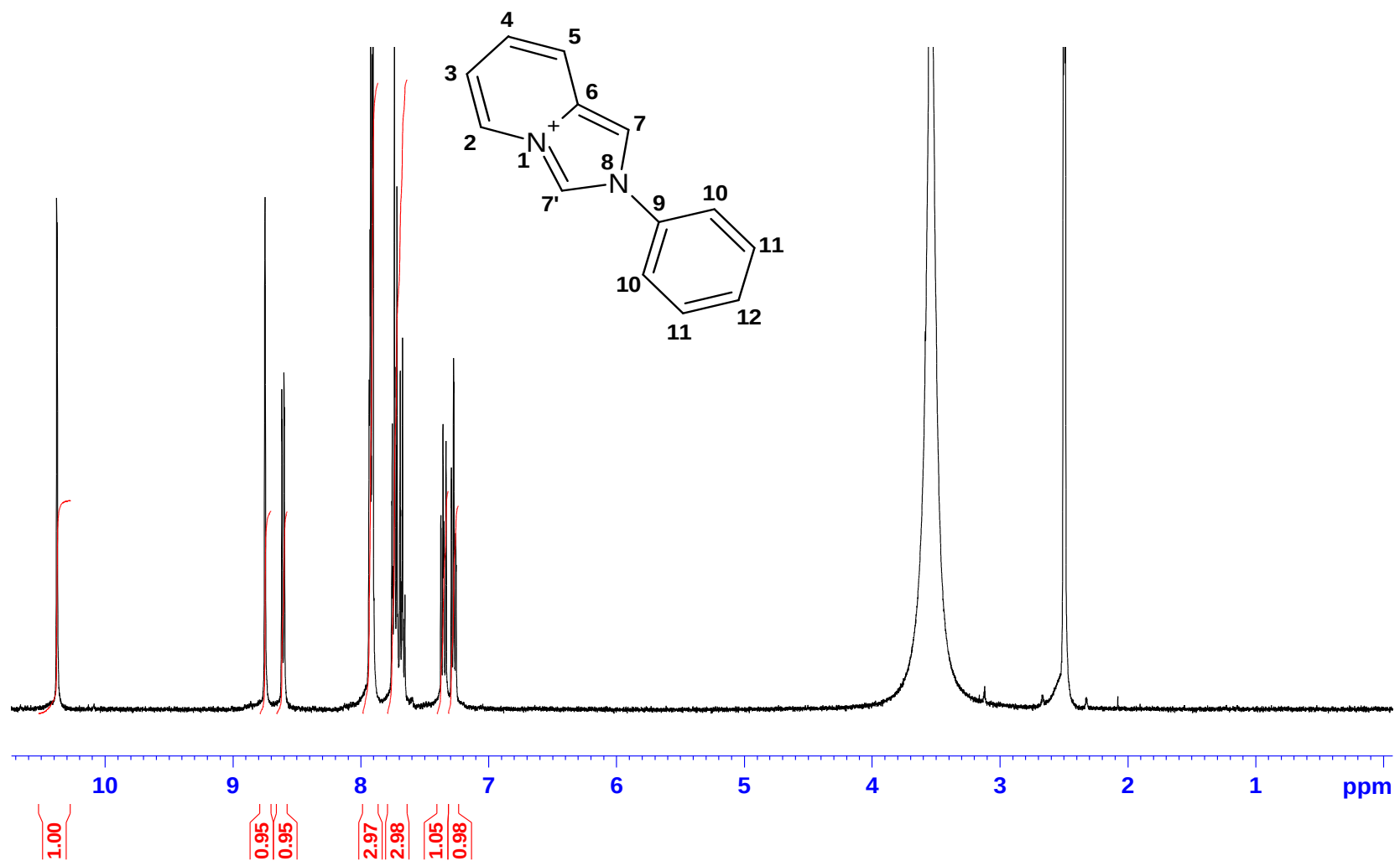


Plate 1a: ^{13}C NMR spectrum of pyridyl[1,5-a]-4-phenylimidazolium chloride (**4.3a**)

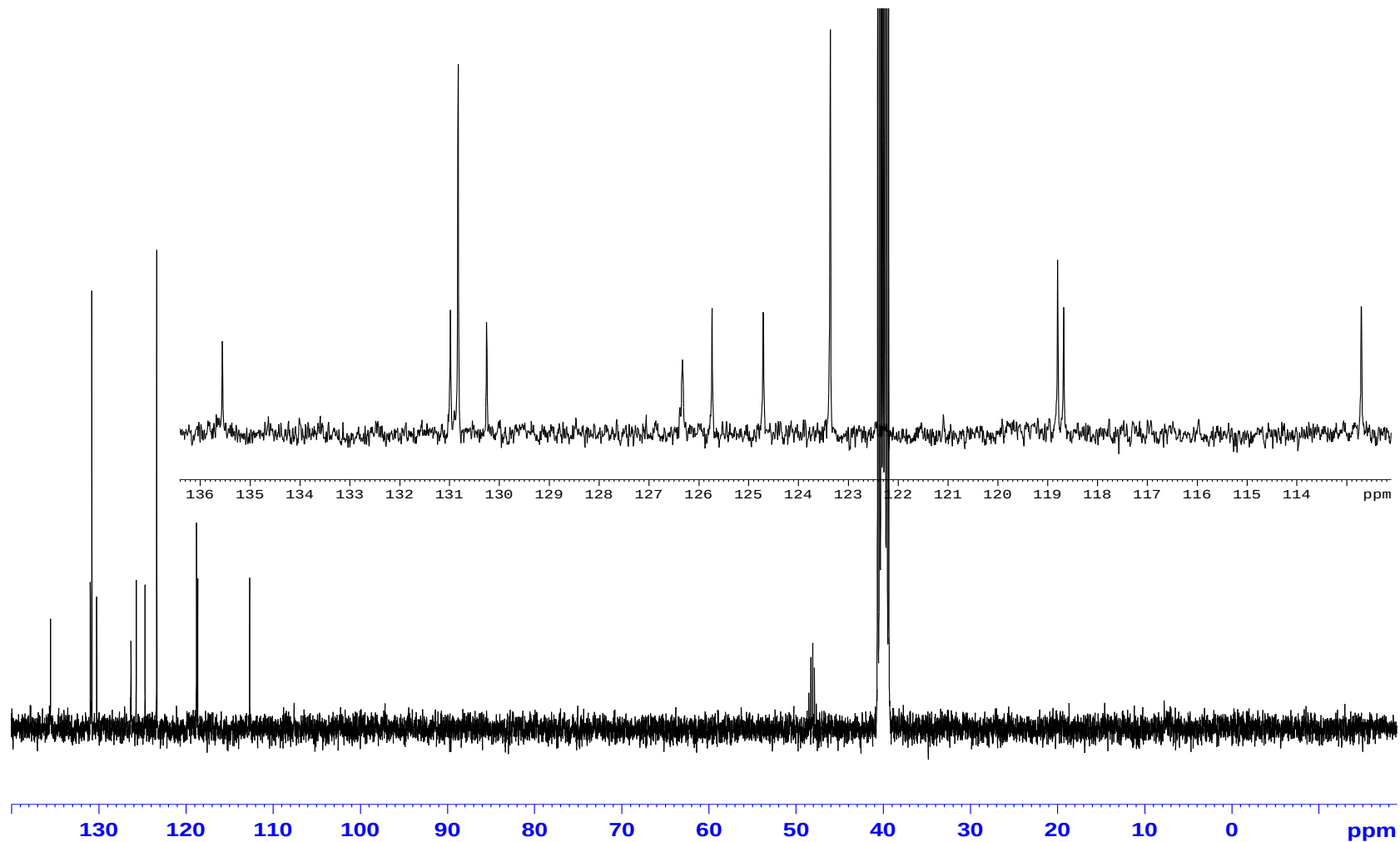


Plate 1b: ^{13}C Dept 135 NMR spectrum of pyridyl[1,5-*a*]-4-phenylimidazolium chloride (**4.3a**)

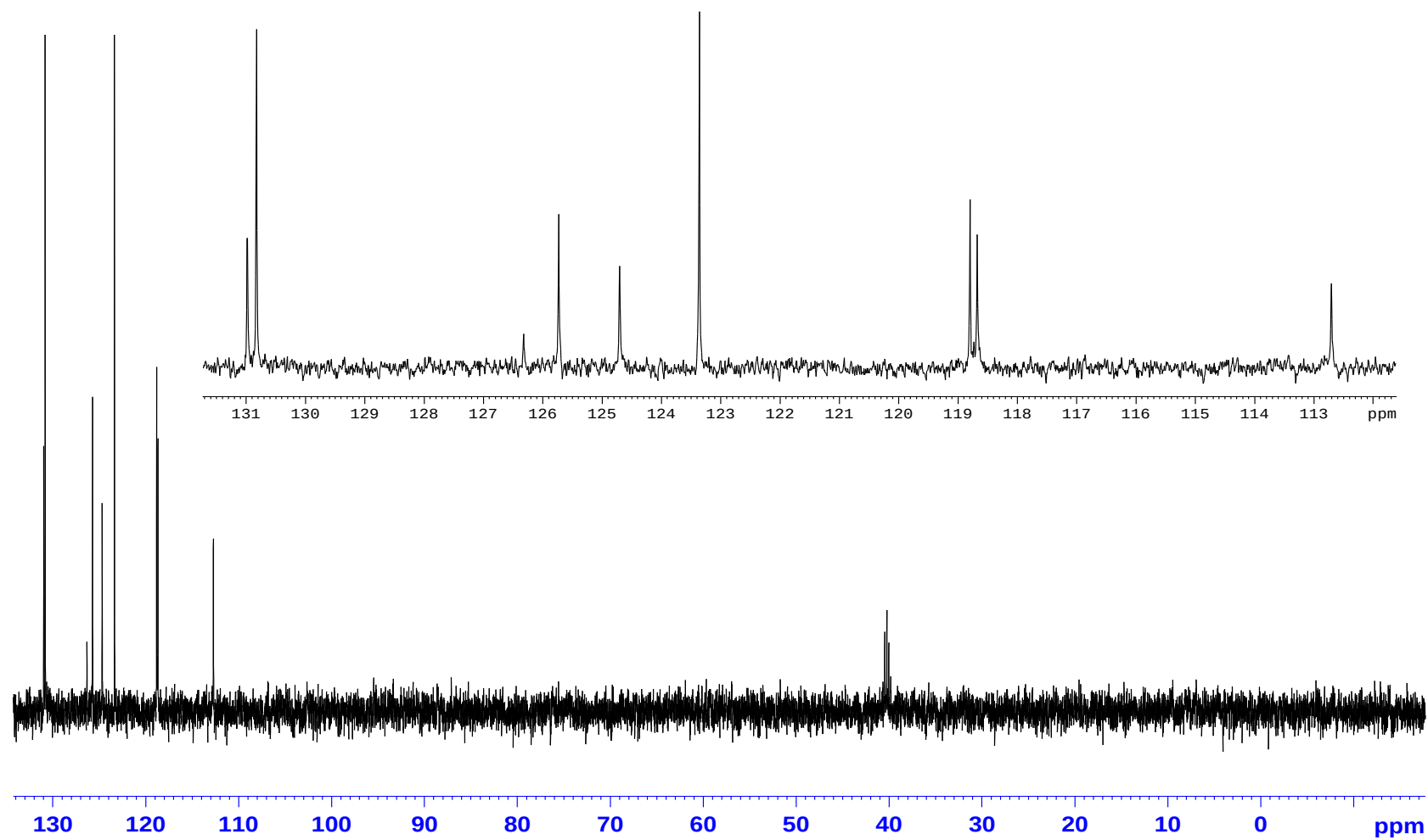


Plate 1c: IR spectrum of pyridyl[1,5-a]-4-phenylimidazolium chloride (**4.3a**)

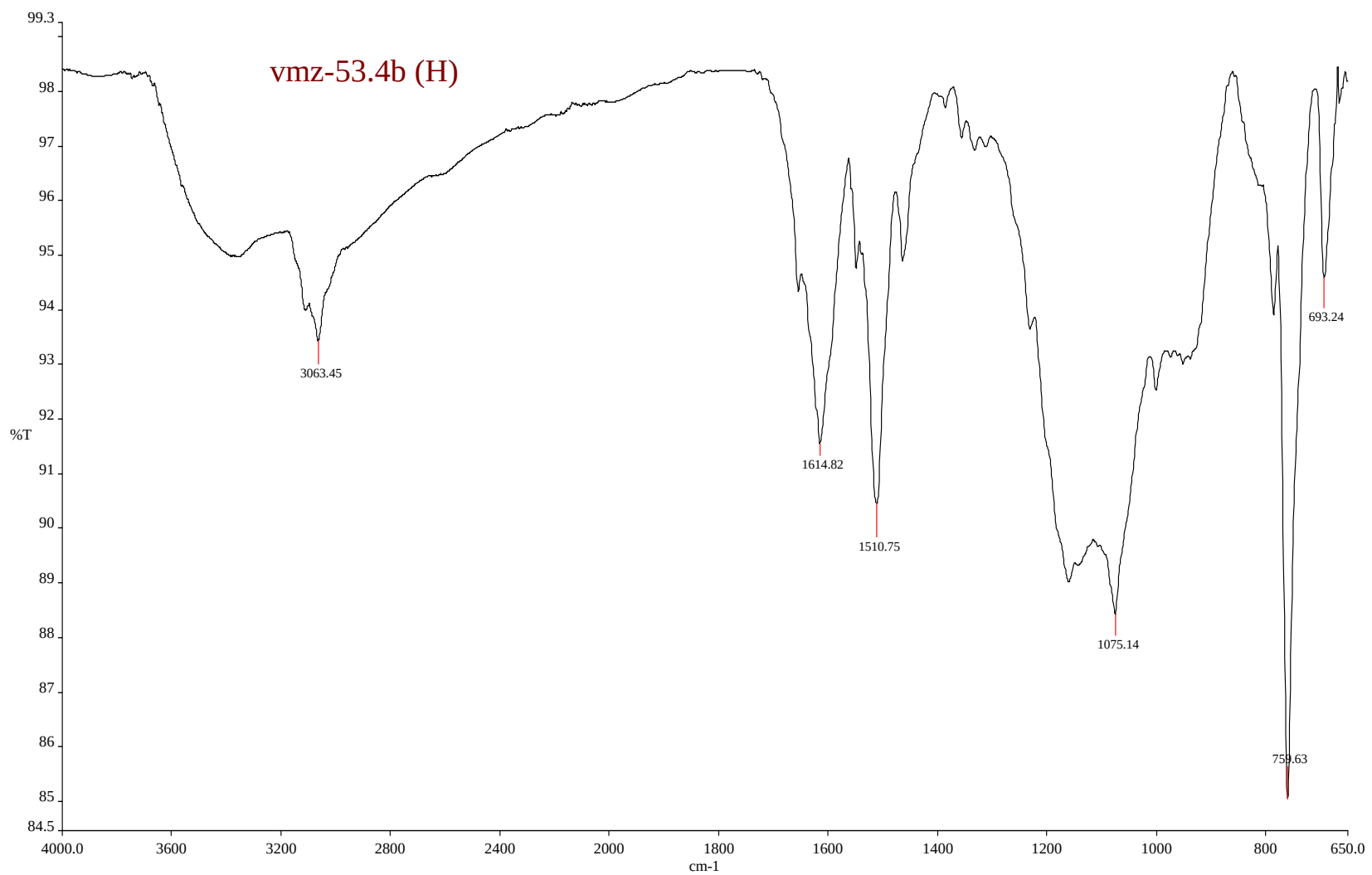


Plate 1d: HRMS spectrum of pyridyl[1,5-a]-4-phenylimidazolium chloride (4.3a)

Elemental Composition Report

Page 1

Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 50.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions

3 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)

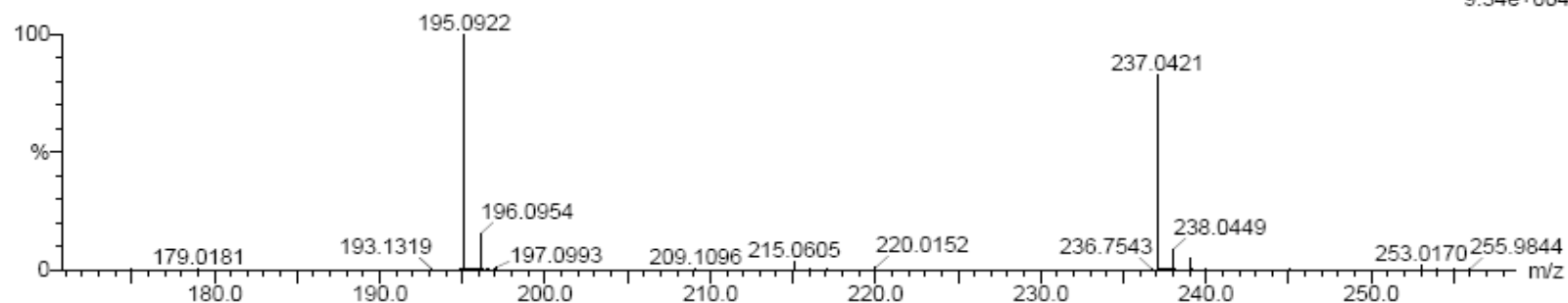
Elements Used:

C: 10-15 H: 10-15 N: 0-5

Vuyisa Mzozoyana

VMZ_53_4b 27 (0.439) Cm (1:61)

TOF MS ES+
9.34e+004



Minimum: -1.5
Maximum: 5.0 5.0 50.0

Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	i-FIT (Norm)	Formula
195.0922	195.0922	0.0	0.0	9.5	599.3	0.0	C13 H11 N2

Plate 2: ^1H NMR spectrum of pyridyl[1,5-*a*]-4-phenylimidazolium chloride (**4.3b**)

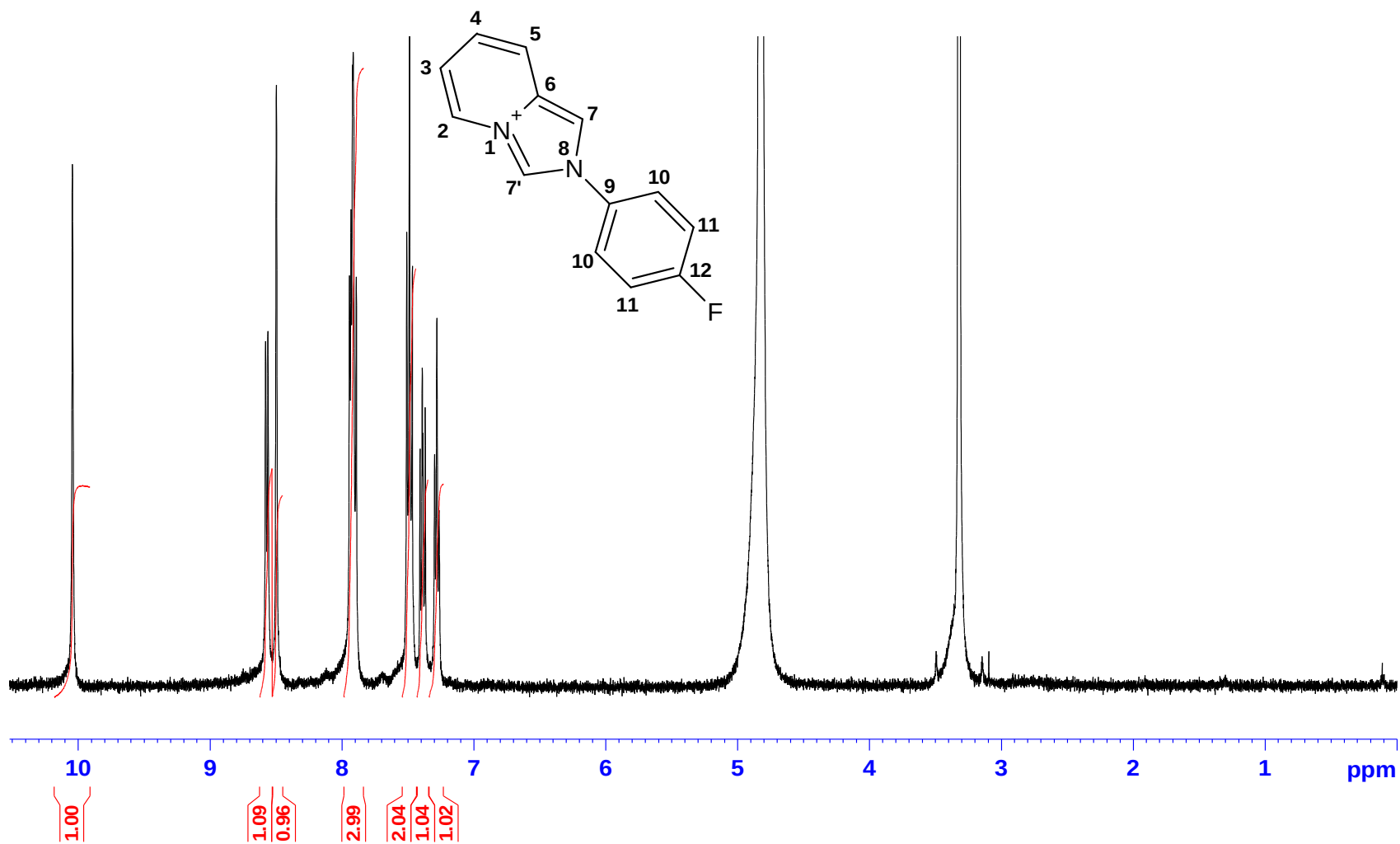


Plate 2a: ^{13}C NMR spectrum of pyridyl[1,5-*a*]-4-(*p*-fluoro)phenylimidazolium chloride (4.3b)

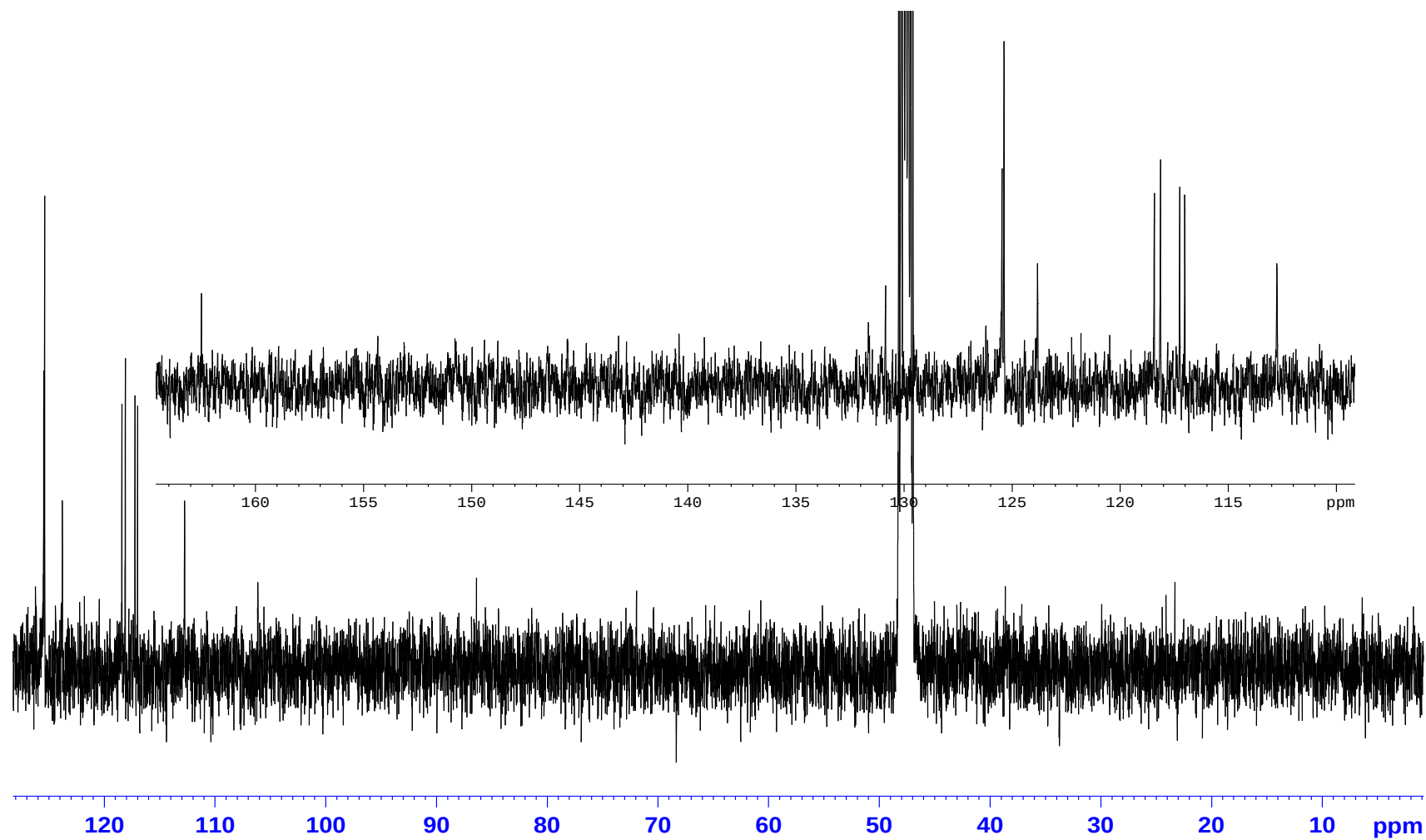


Plate 2b: IR spectrum of pyridyl[1,5-a]-4-(p-fluoro)phenylimidazolium chloride (**4.3b**)

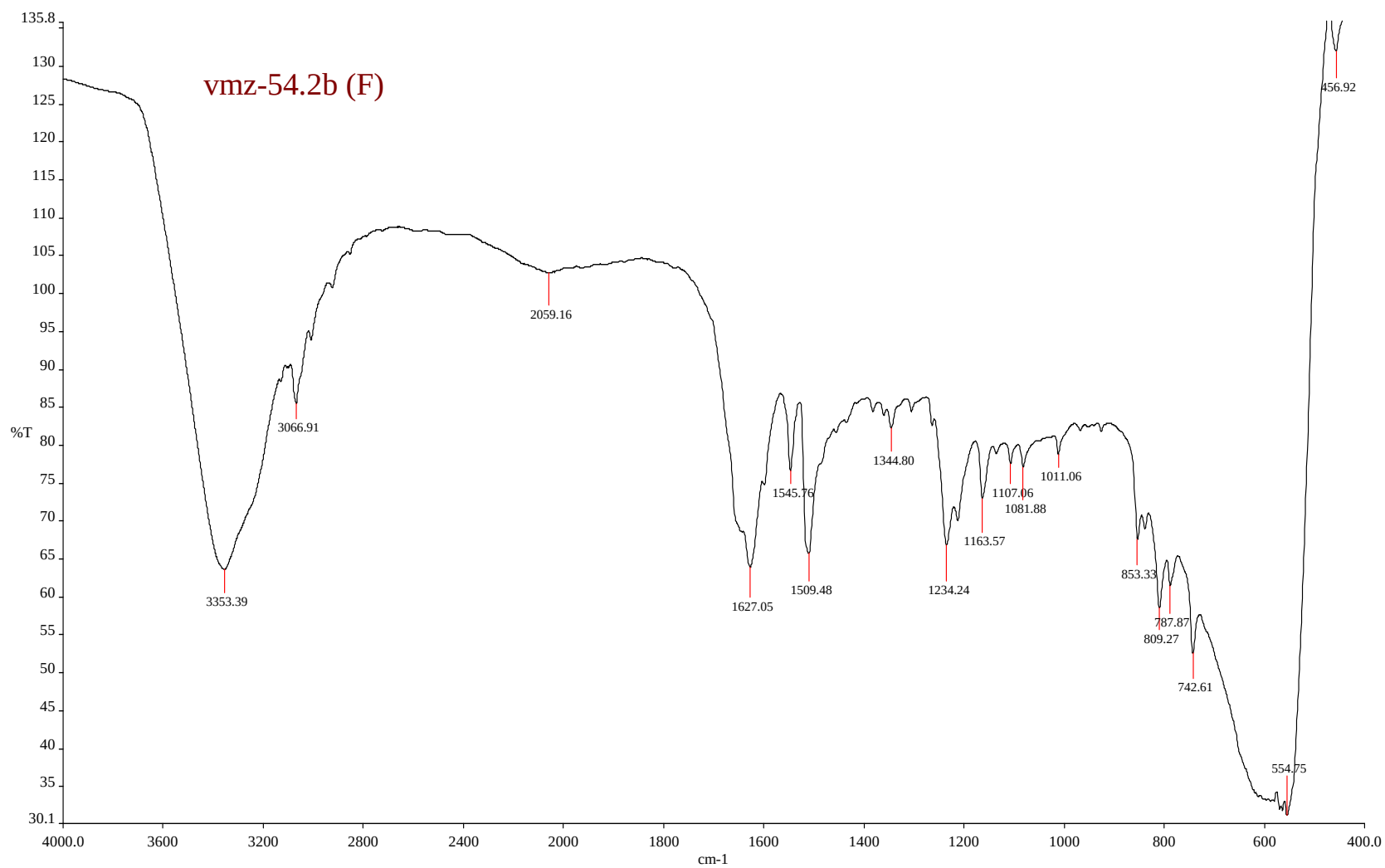


Plate 2c: HRMS spectrum of pyridyl[1,5-a]-4-(p-fluoro)phenylimidazolium chloride (4.3b)

Elemental Composition Report

Page 1

Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 50.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions

29 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)

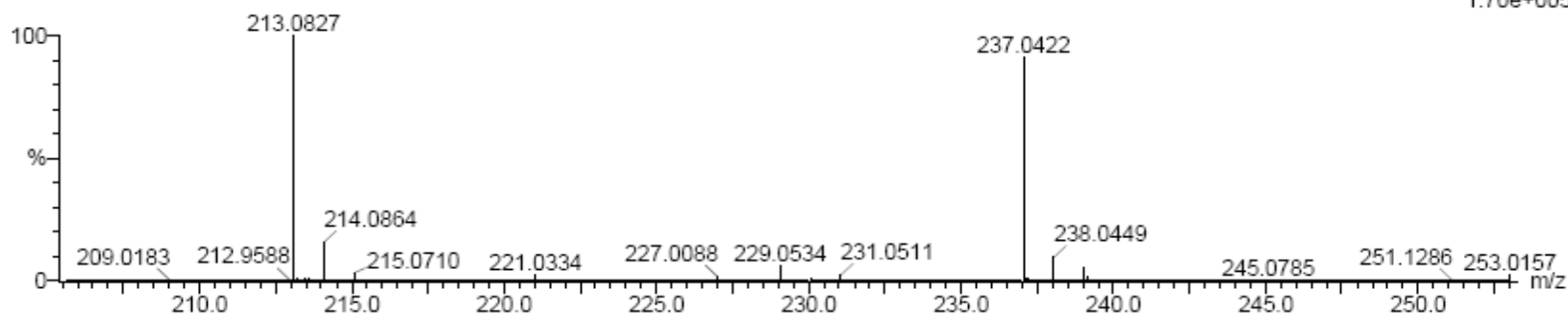
Elements Used:

C: 10-15 H: 5-15 N: 0-5 F: 0-5

Vuyisa Mzozoyana

VMZ_54_2b 2 (0.017) Cm (1:61)

TOF MS ES+
1.70e+005



Minimum: -1.5
Maximum: 5.0 5.0 50.0

Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	i-FIT (Norm)	Formula
213.0827	213.0828	-0.1	-0.5	9.5	685.0	0.0	C13 H10 N2 F

Plate 3: ^1H NMR spectrum of pyridyl[1,5-*a*]-4-(*p*-chloro)phenylimidazolium chloride (**4.3c**)

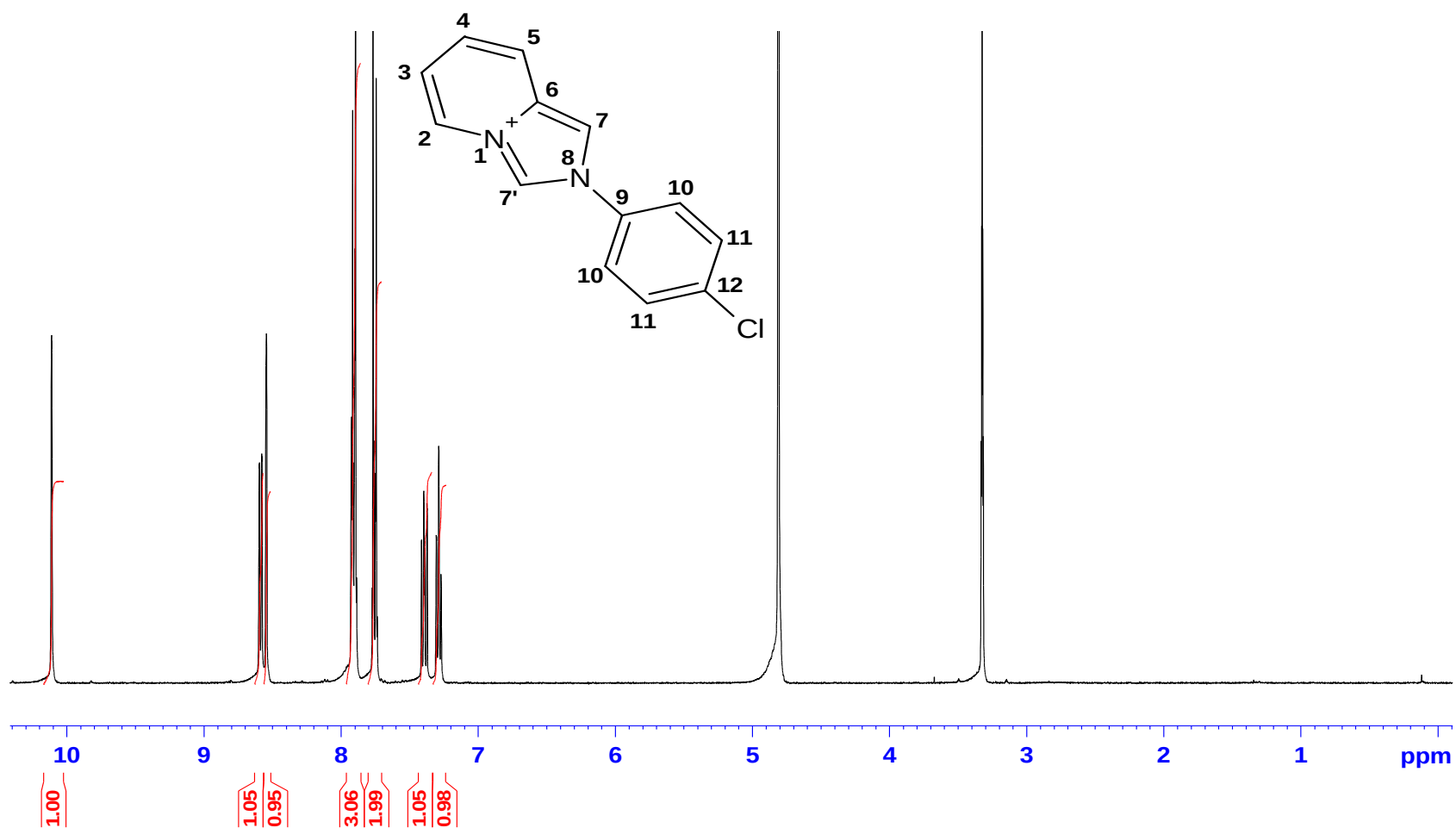


Plate 3a: ^{13}C NMR spectrum of pyridyl[1,5-*a*]-4-(*p*-chloro)phenylimidazolium chloride (4.3c)

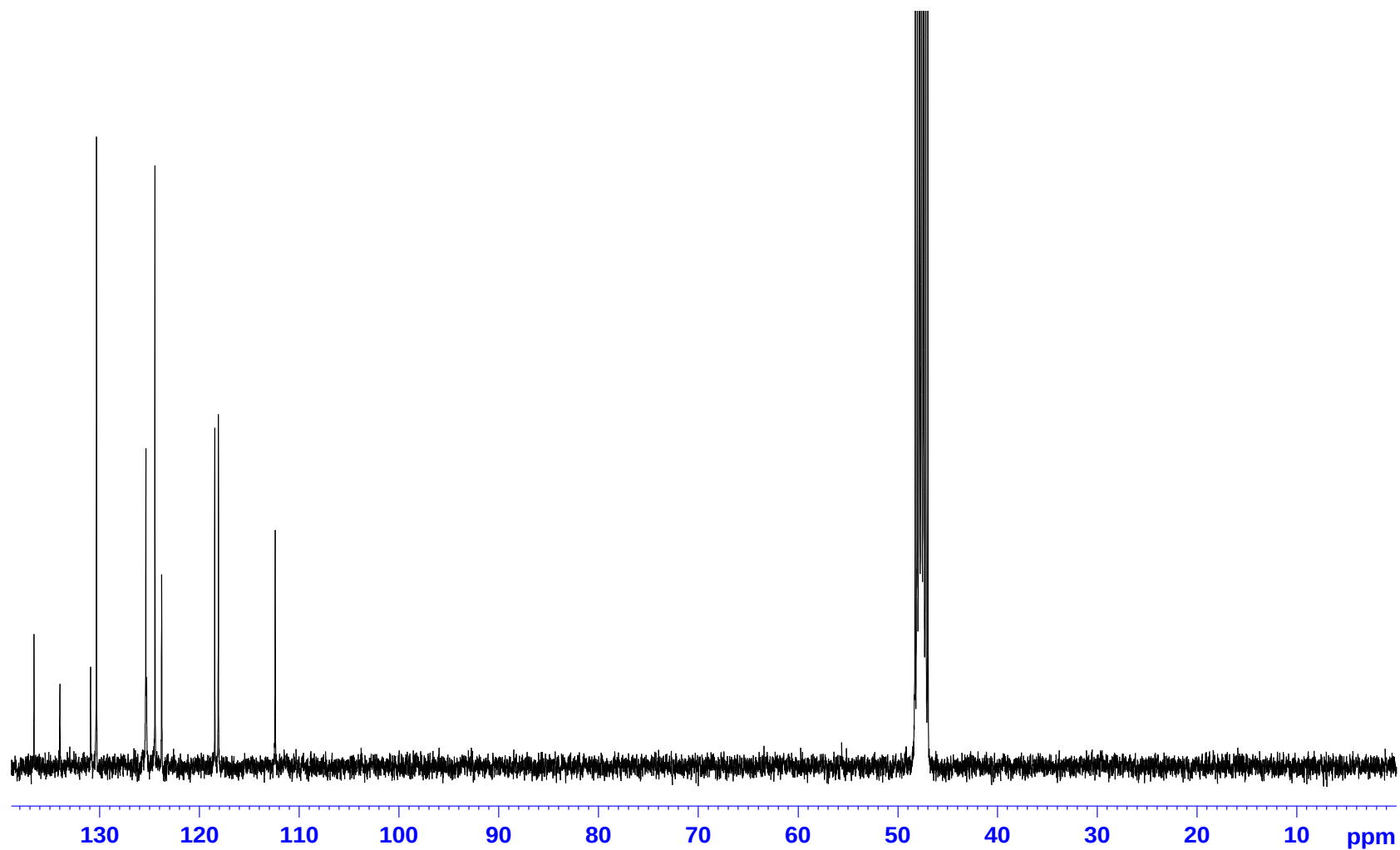


Plate 3b: IR spectrum of pyridyl[1,5-a]-4-(p-chloro)phenylimidazolium chloride (**4.3c**)

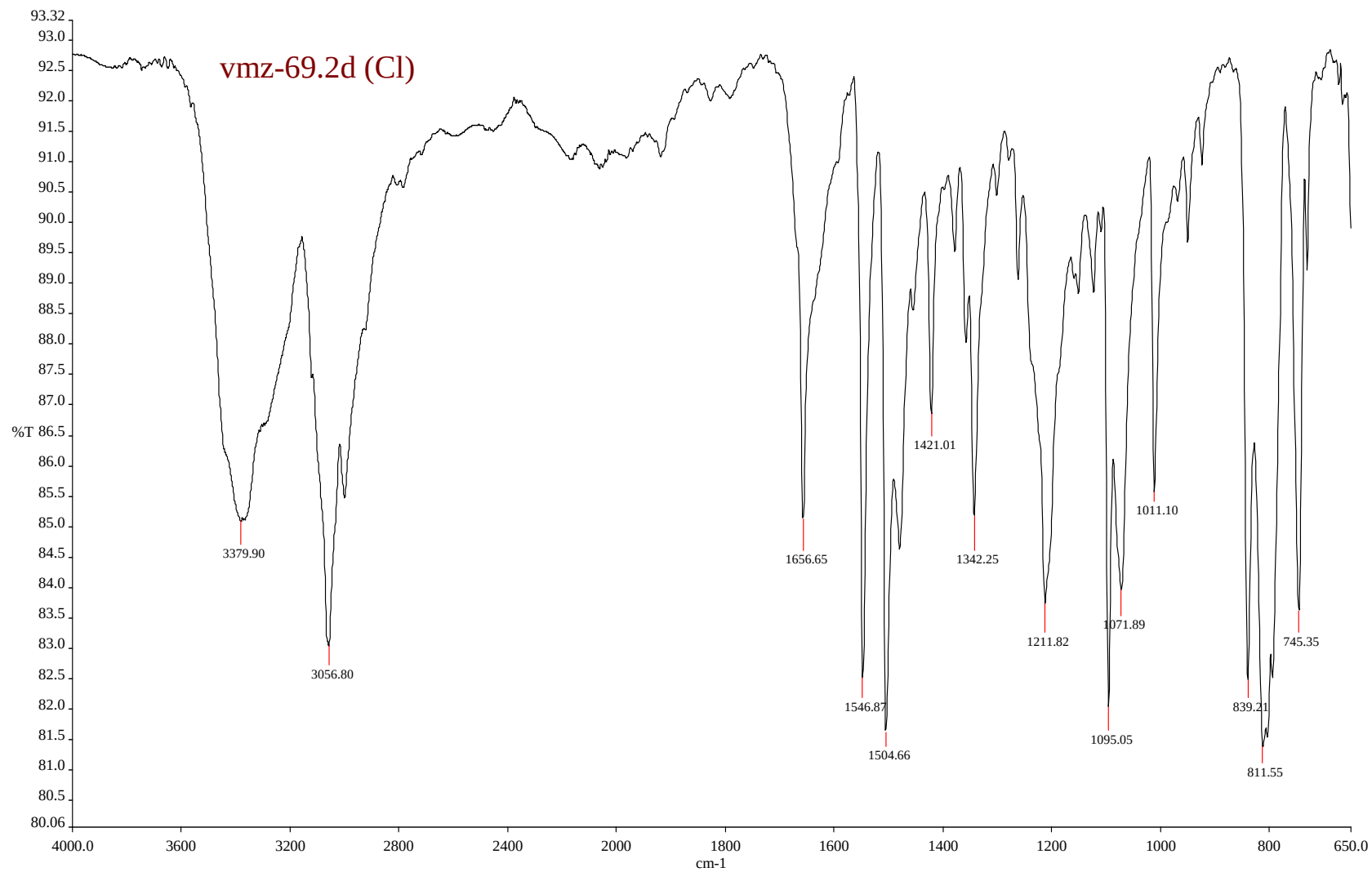


Plate 3c: HRMS spectrum of pyridyl[1,5-a]-4-(p-chloro)phenylimidazolium chloride (4.3c)

Elemental Composition Report

Page 1

Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 50.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions

9 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)

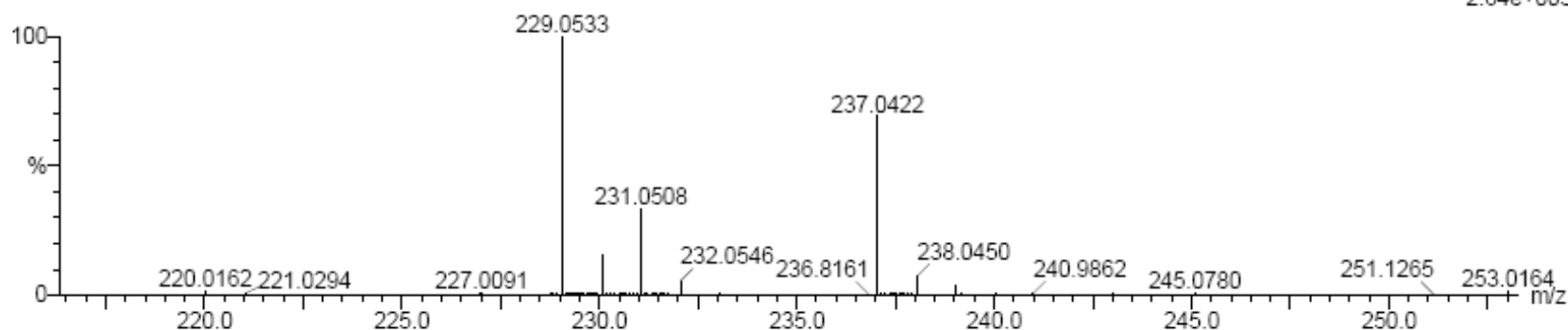
Elements Used:

C: 10-15 H: 5-15 N: 0-5 Cl: 0-1

Vuyisa Mzozoyana

VMZ_69_2d 5 (0.068) Cm (1:61)

TOF MS ES+
2.64e+005



Minimum:

Maximum:

5.0 5.0 -1.5
50.0

Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	i-FIT (Norm)	Formula
229.0533	229.0533	0.0	0.0	9.5	709.7	0.0	C13 H10 N2 Cl

Plate 4: ^1H NMR spectrum of pyridyl[1,5-*a*]-4-(*p*-bromo)phenylimidazolium chloride (**4.3d**)

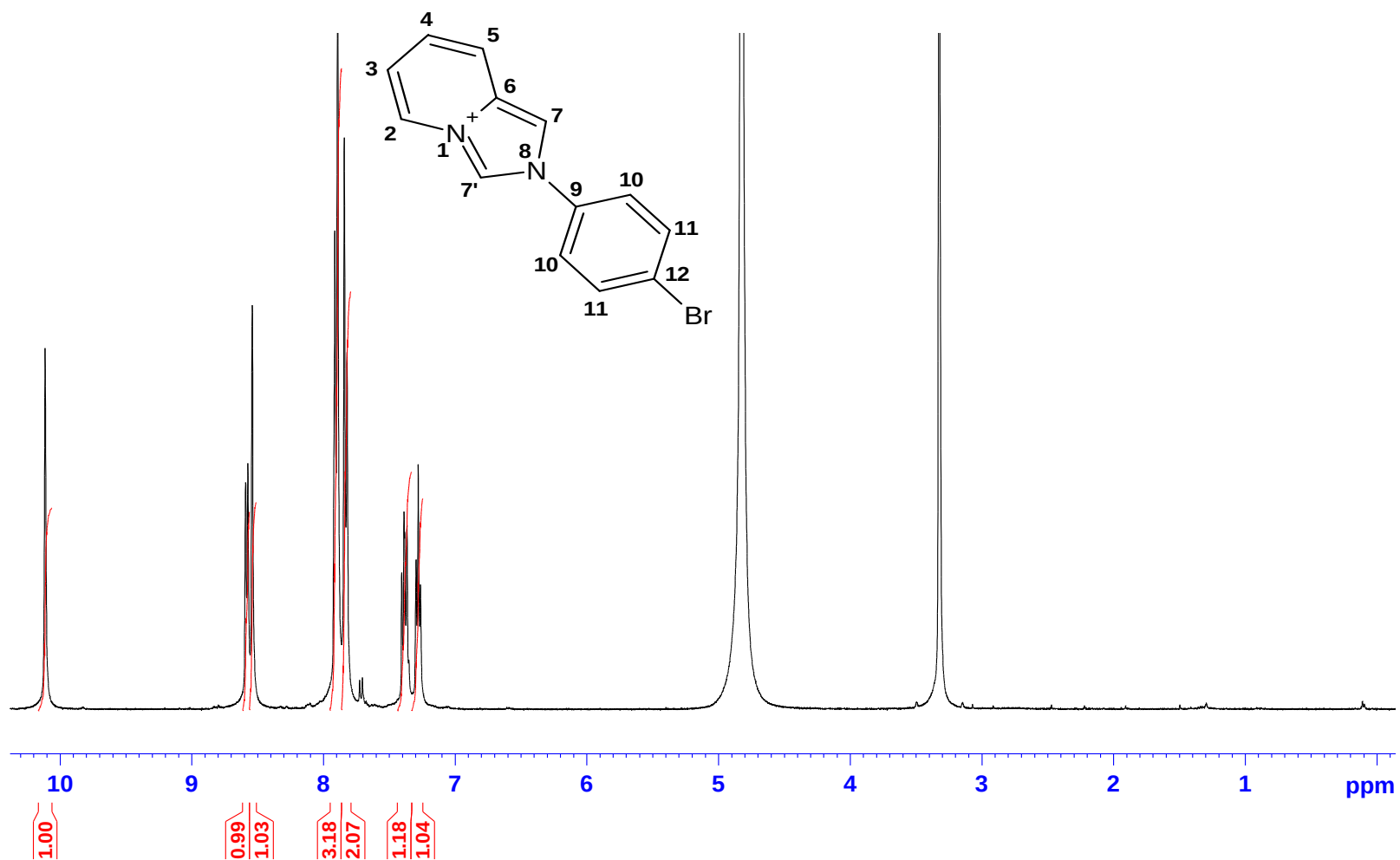


Plate 4a: ^{13}C NMR spectrum of pyridyl[1,5-*a*]-4-(*p*-bromo)phenylimidazolium chloride (**4.3d**)

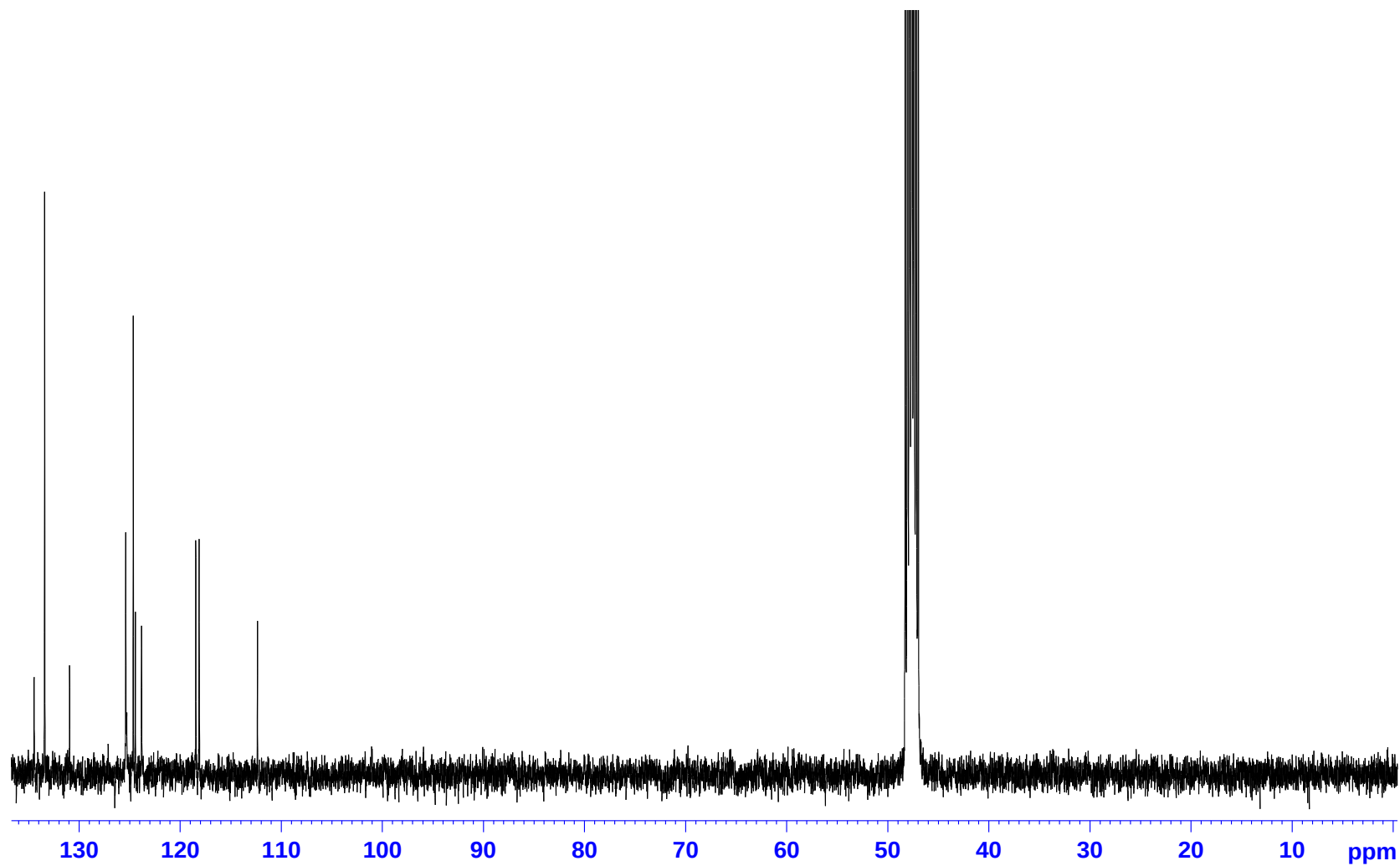


Plate 4b: IR spectrum of pyridyl[1,5-a]-4-(p-bromo)phenylimidazolium chloride (4.3d)

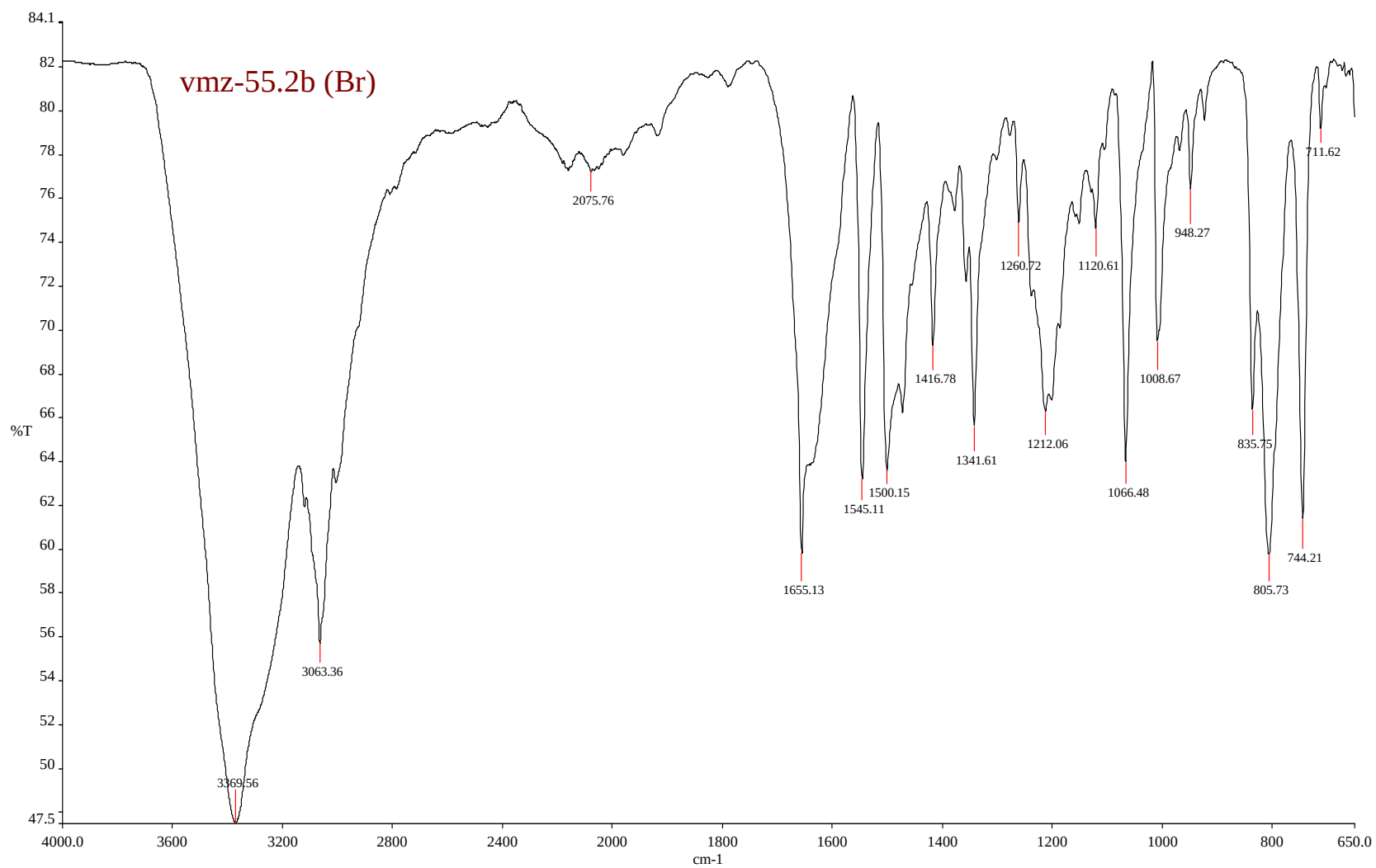


Plate 4b: IR spectrum of pyridyl[1,5-*a*]-4-(*p*-bromo)phenylimidazolium chloride (**4.3d**)

Elemental Composition Report

Page 1

Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 50.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions

9 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)

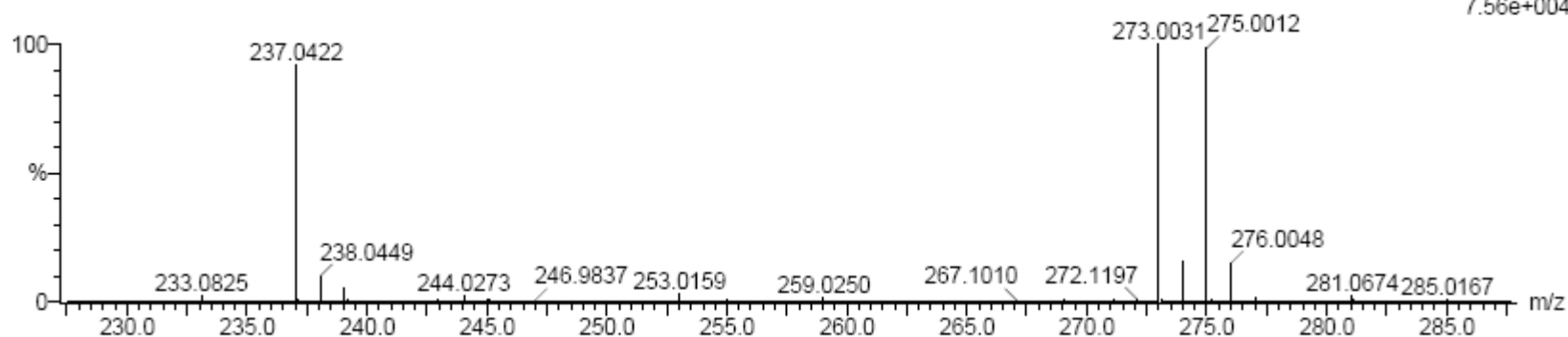
Elements Used:

C: 10-15 H: 5-15 N: 0-5 Br: 0-1

Vuyisa Mzozoyana

VMZ_55_2b 29 (0.489) Cm (1:59)

TOF MS ES+
7.56e+004



Minimum: -1.5
Maximum: 5.0 5.0 50.0

Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	i-FIT (Norm)	Formula
273.0031	273.0027	0.4	1.5	9.5	562.3	0.0	C13 H10 N2 Br

Plate 5: ^1H NMR spectrum of pyridyl[1,5-*a*]-4-(*o*-methyl)phenylimidazolium chloride (**4.3e**)

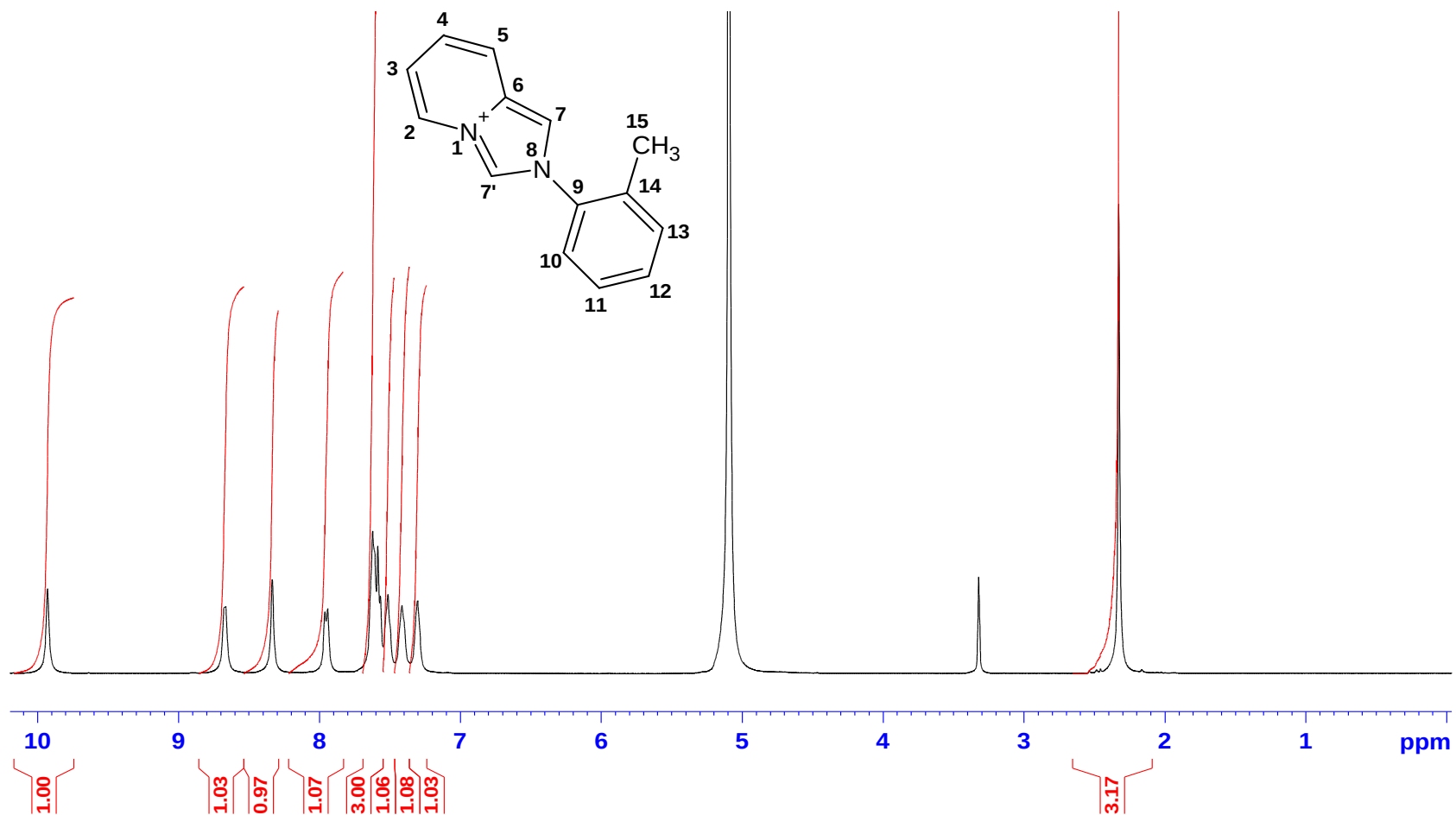


Plate 5a: ^{13}C NMR spectrum of pyridyl[1,5-*a*]-4-(*o*-methyl)phenylimidazolium chloride (**4.3e**)

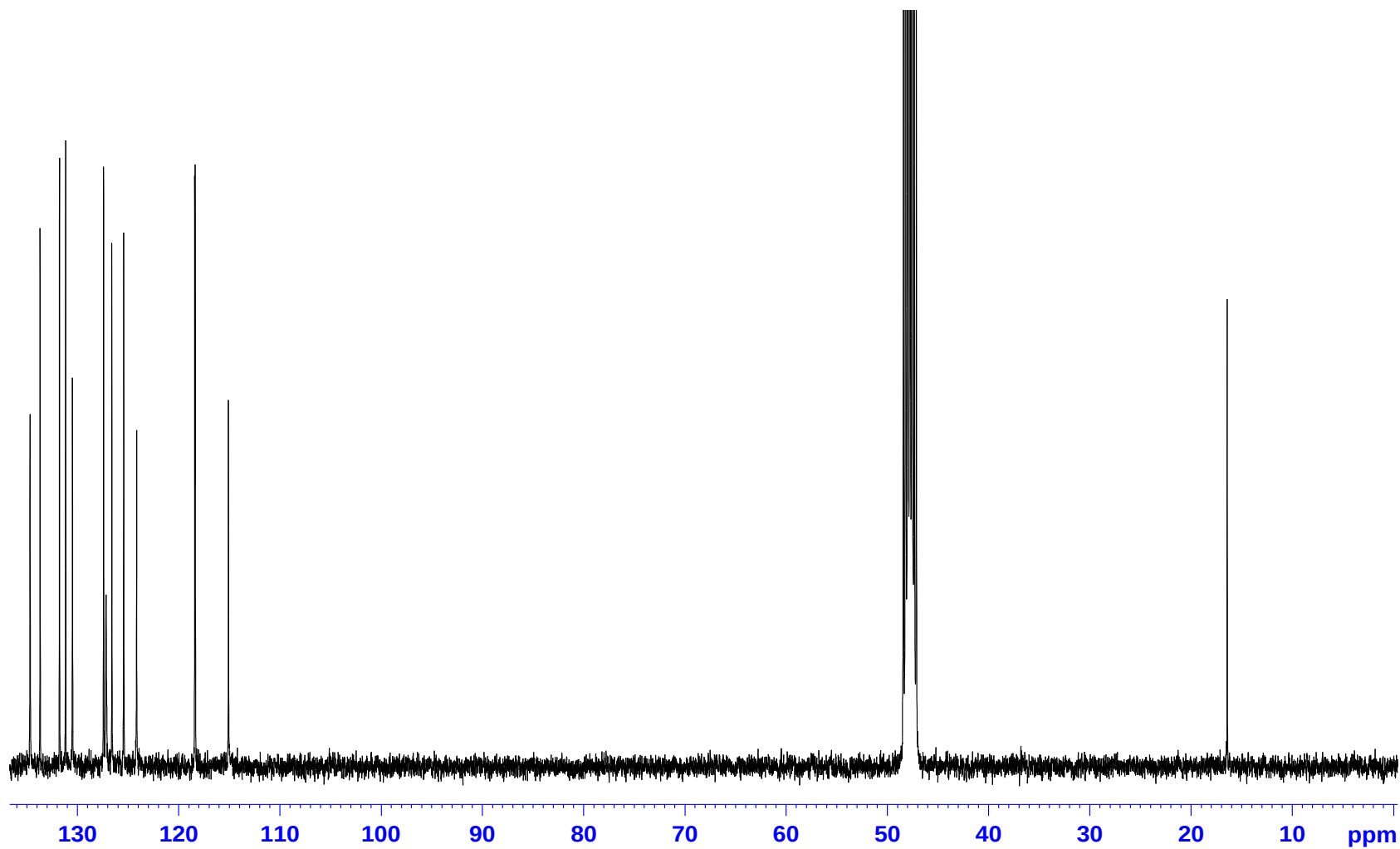


Plate 6: ^1H NMR spectrum of pyridyl[1,5-*a*]-4-(*m*-methyl)phenylimidazolium chloride (**4.3f**)

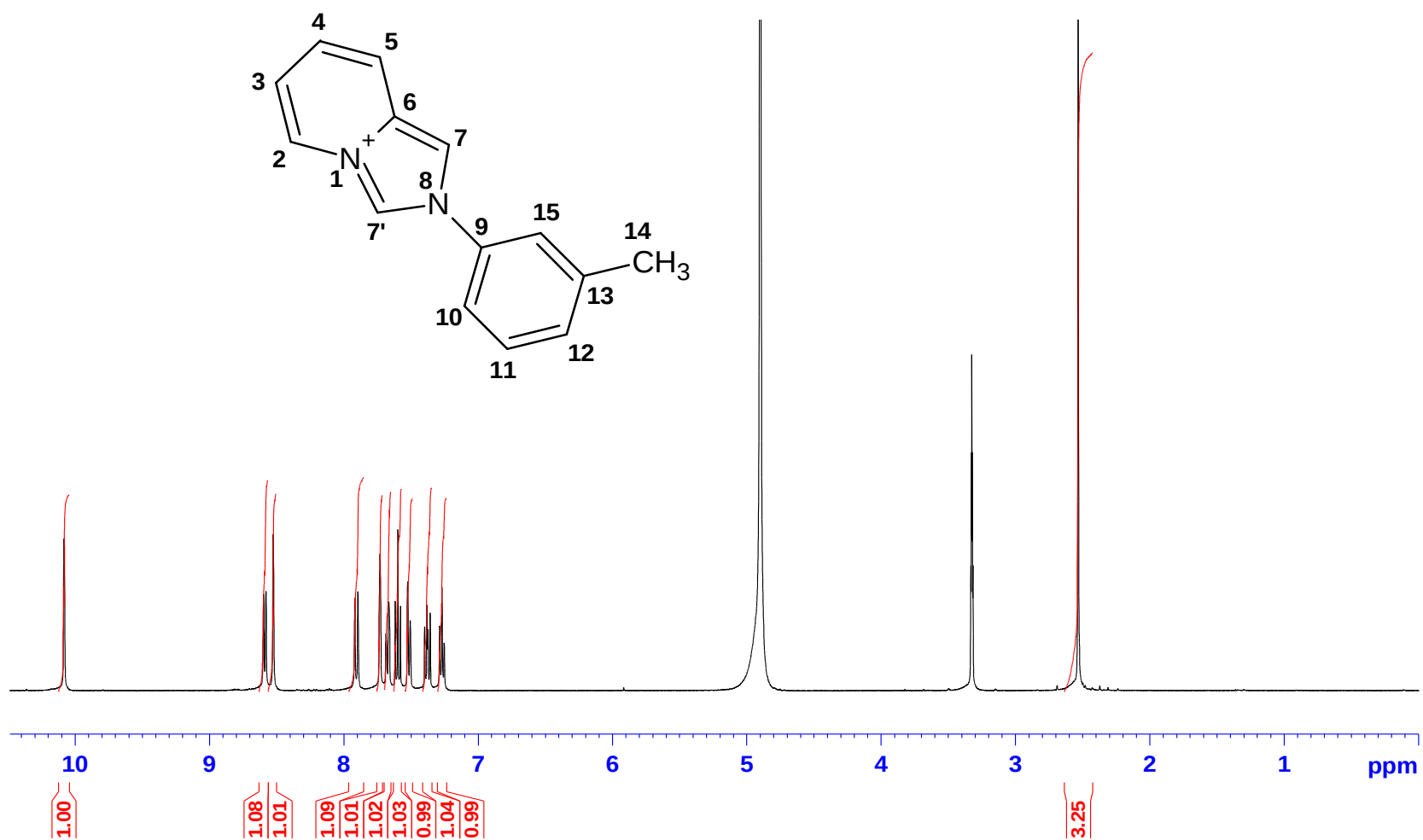


Plate 6a: ^{13}C NMR spectrum of pyridyl[1,5-*a*]-4-(*m*-methyl)phenylimidazolium chloride (**4.3f**)

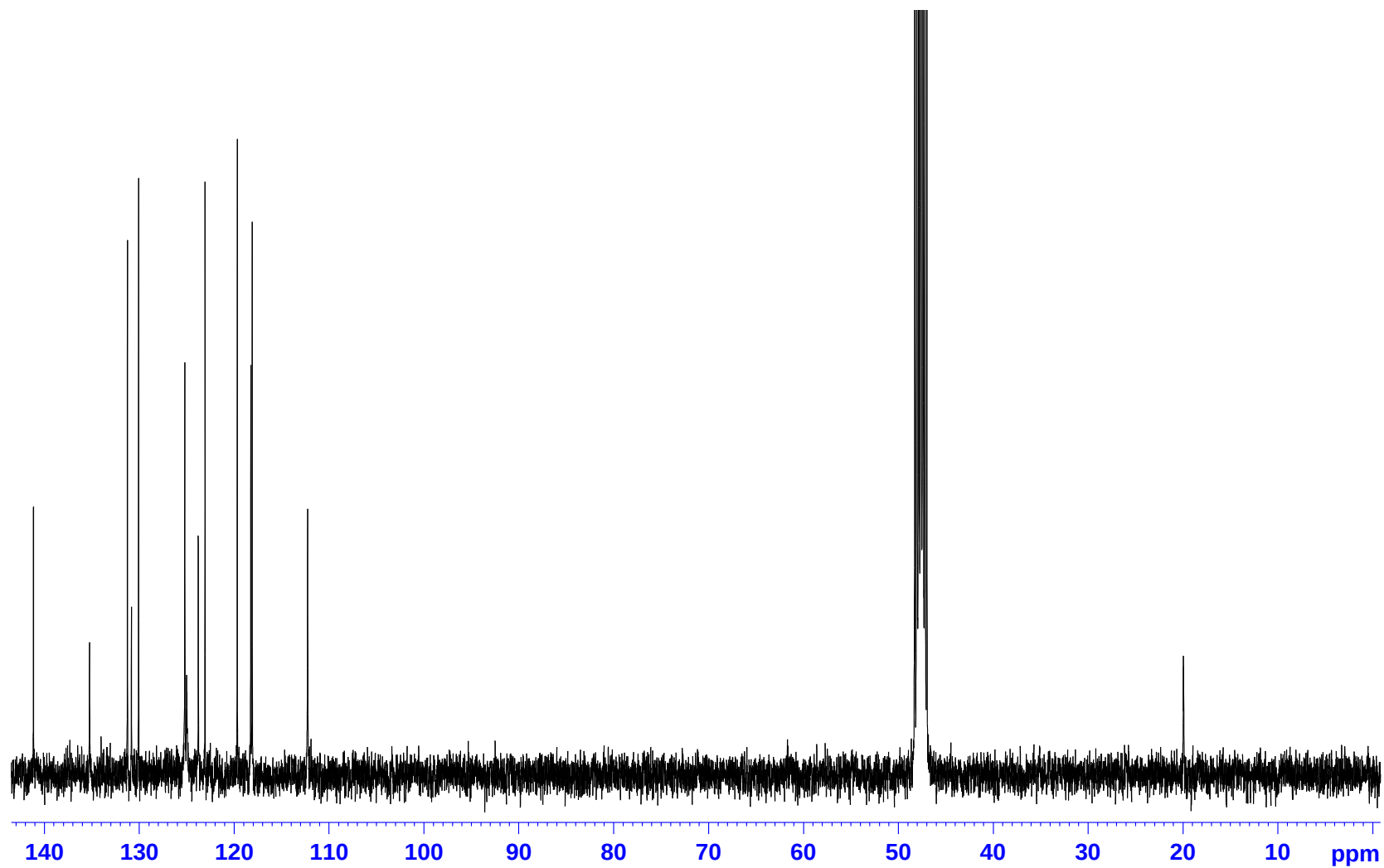


Plate 7: ^1H NMR spectrum of pyridyl[1,5-*a*]-4-(*p*-methyl)phenylimidazolium chloride (**4.3g**)

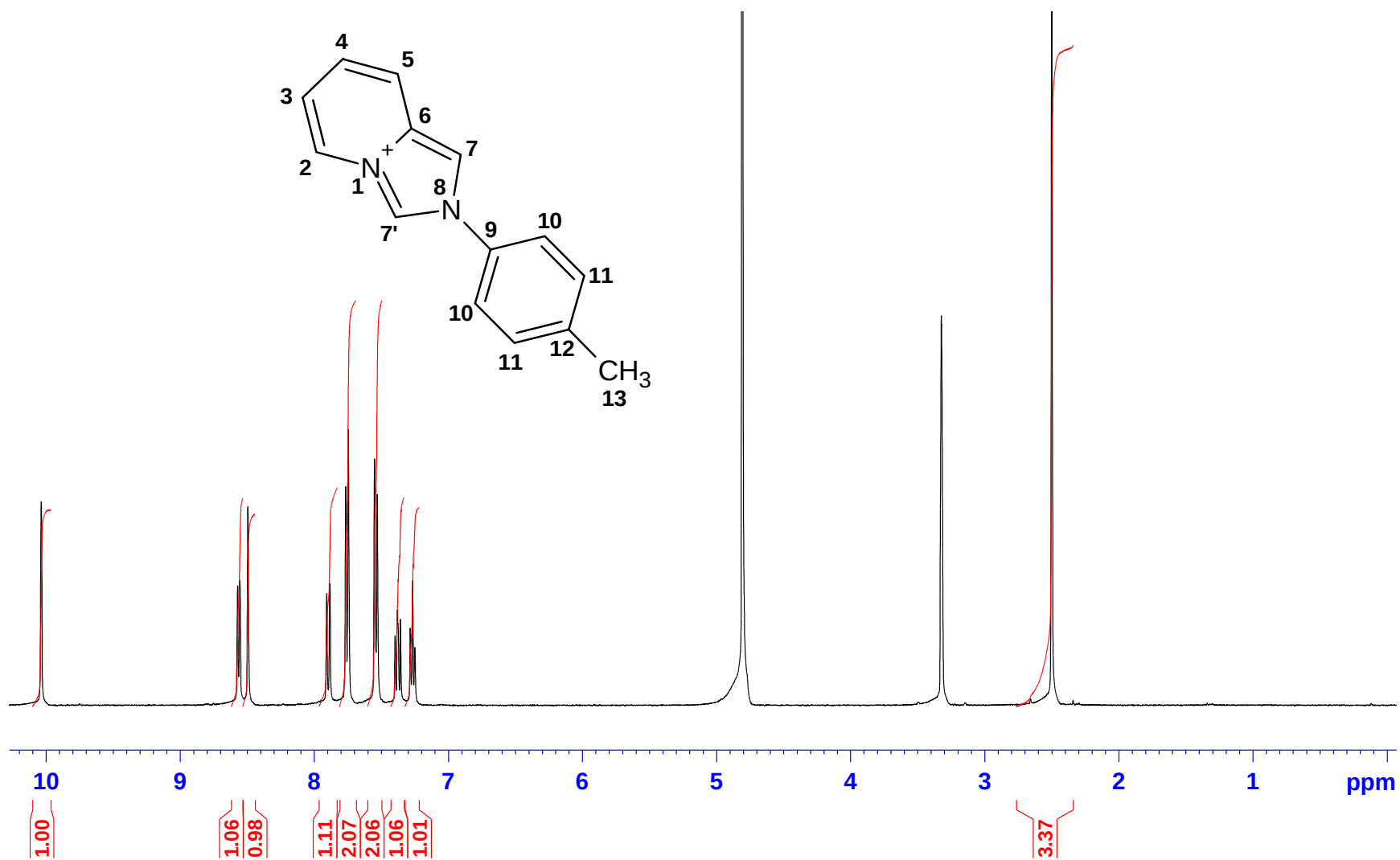


Plate 7a: ^{13}C NMR spectrum of pyridyl[1,5-*a*]-4-(*p*-methyl)phenylimidazolium chloride (**4.3g**)

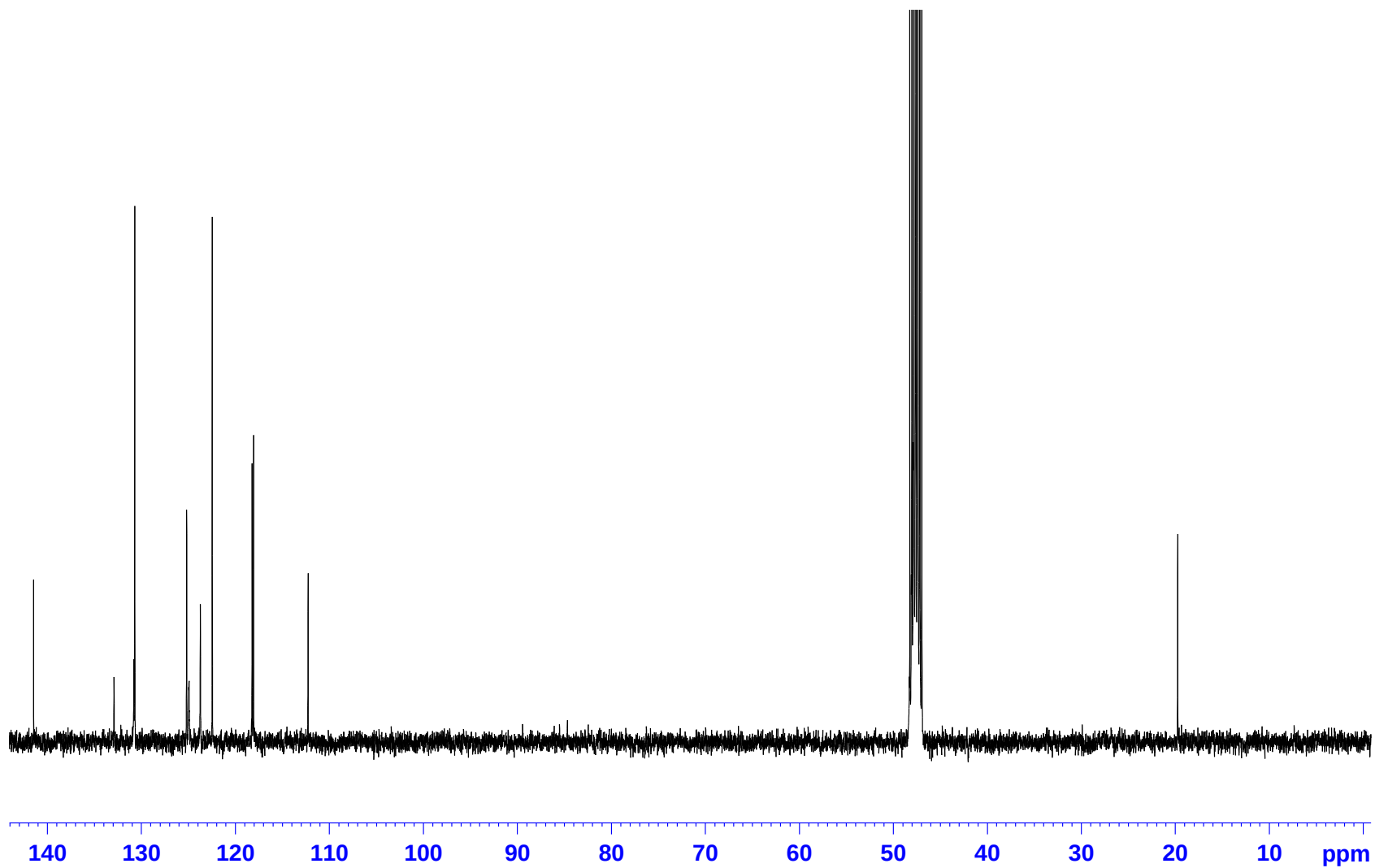


Plate 8: ^1H NMR spectrum of pyridyl[1,5-*a*]-4-(*p*-anisyl)phenylimidazolium chloride (**4.3h**)

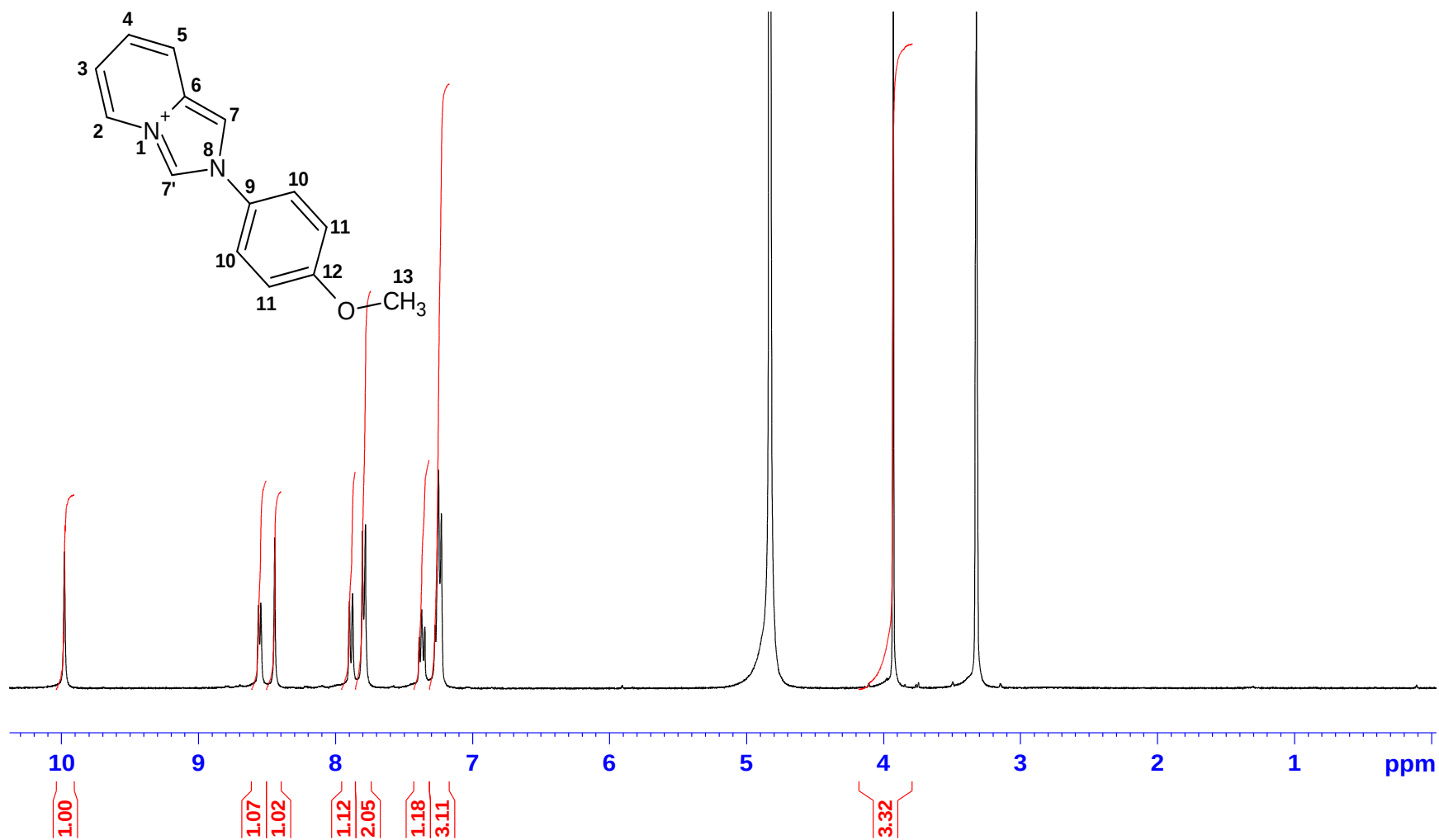


Plate 9: ^1H NMR spectrum of pyridyl[1,5-*a*]-4-(*p*-nitro)phenylimidazolium chloride (**4.3i**)

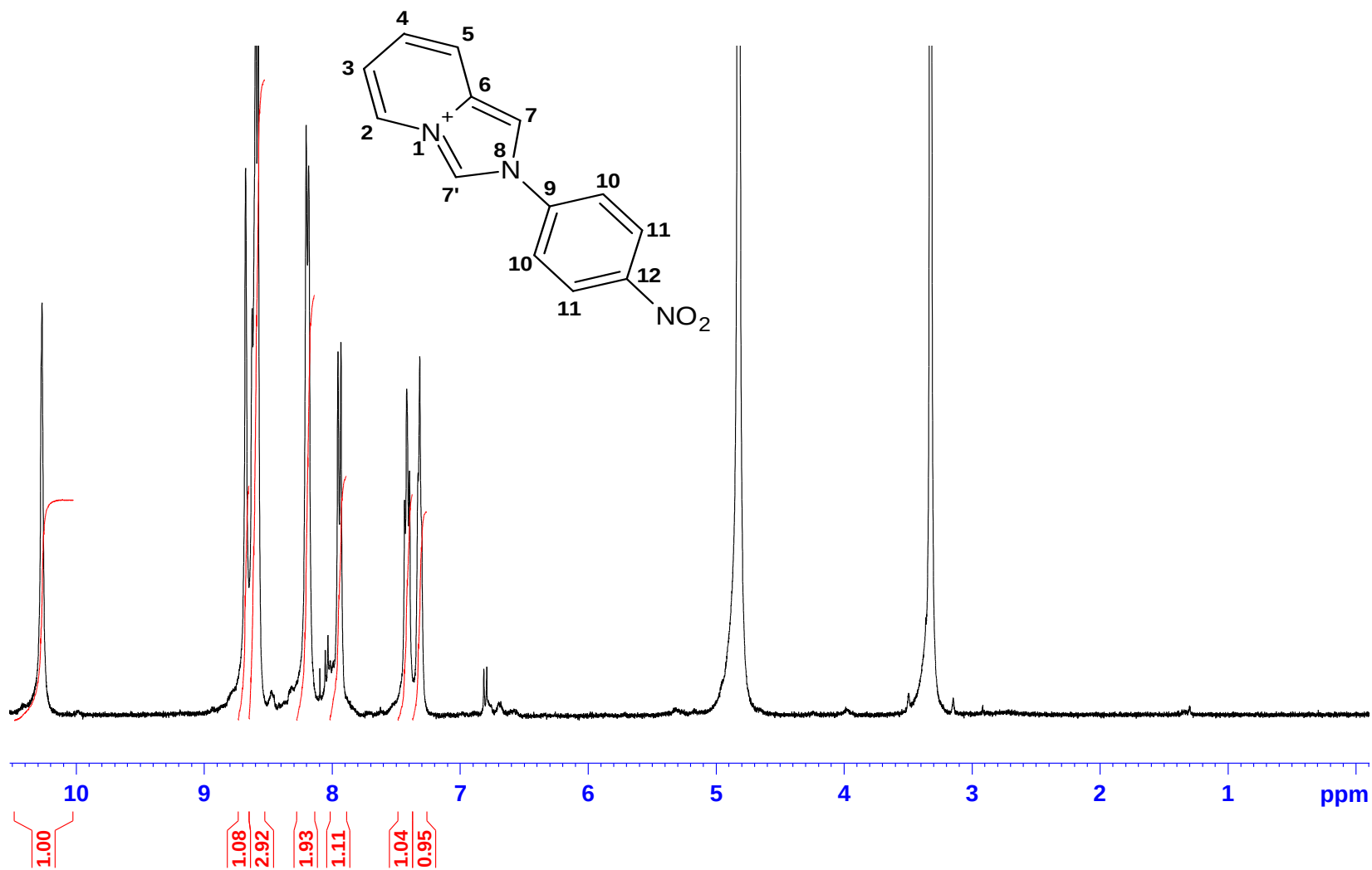


Plate 9a: ^{13}C NMR spectrum of pyridyl[1,5-*a*]-4-(*p*-nitro)phenylimidazolium chloride (**4.3i**)

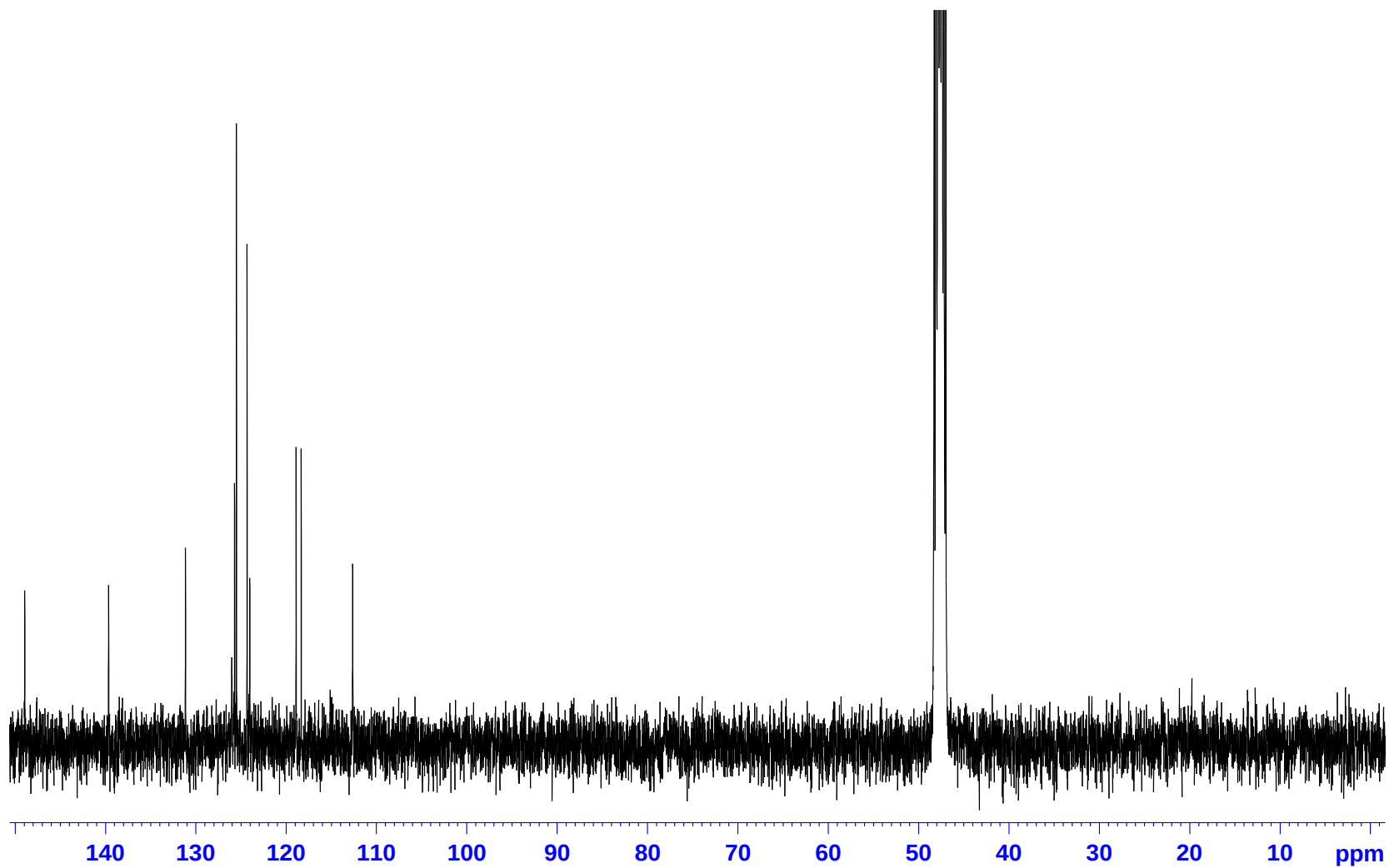


Plate 10: ^1H NMR spectrum of pyridyl[1,5-a]-4-sulfanilamidylimidazolium chloride (**4.3j**)

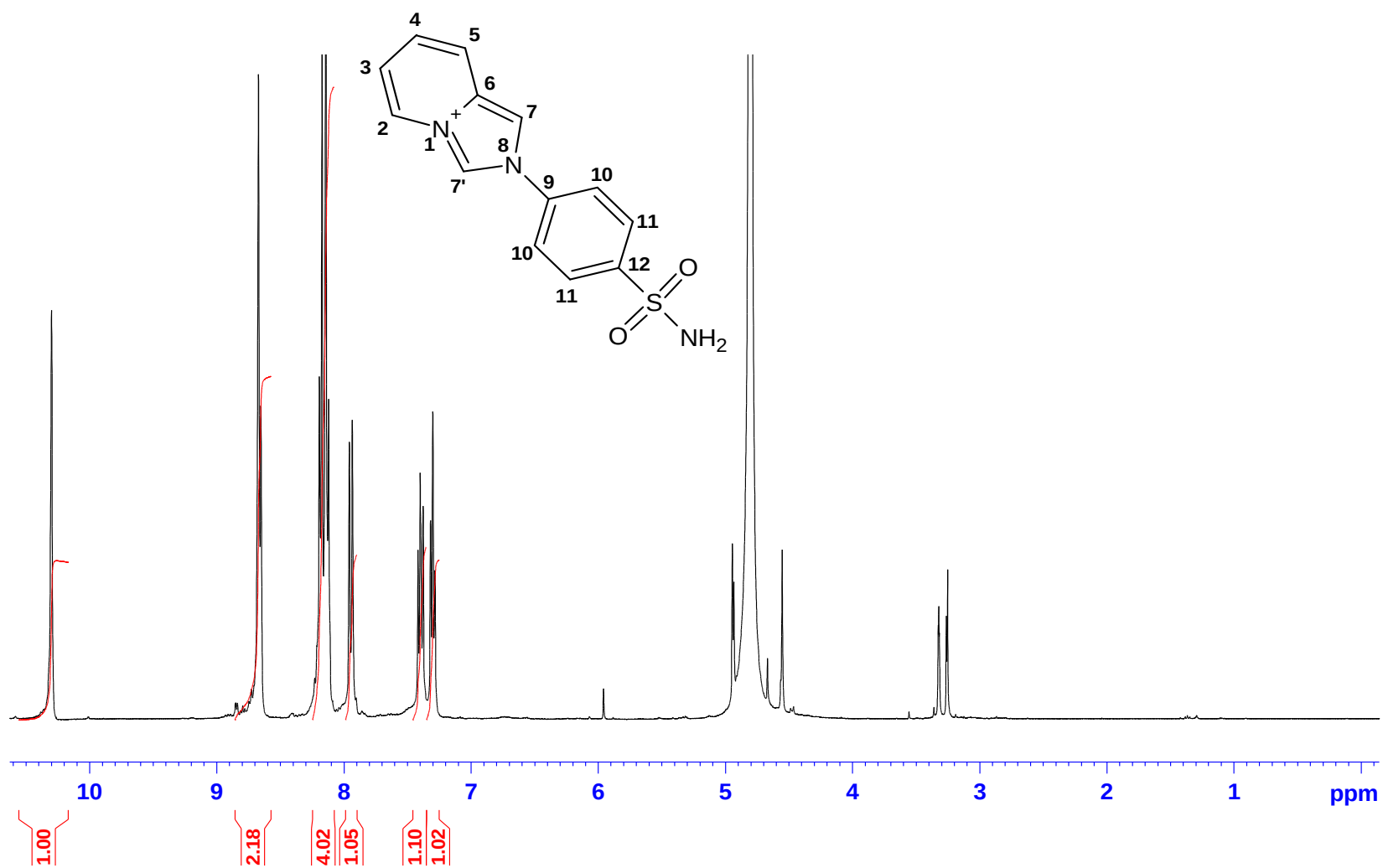


Plate 10a: ^{13}C NMR spectrum of pyridyl[1,5-*a*]-4-sulfanilamidylimidazolium chloride (**4.3j**)

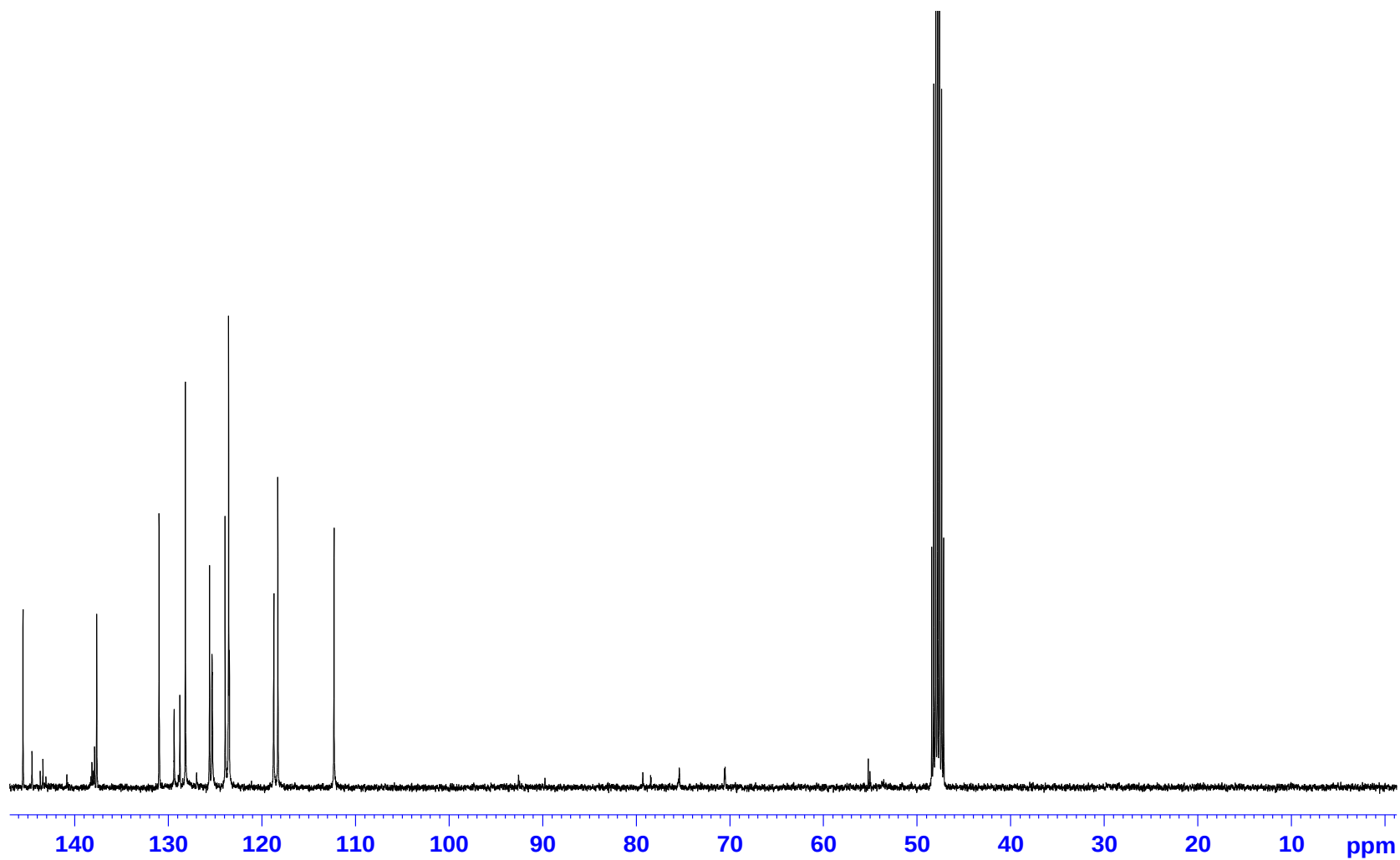


Plate 10b: IR spectrum of pyridyl[1,5-a]-4-sulfanilamidylimidazolium chloride (**4.3j**)

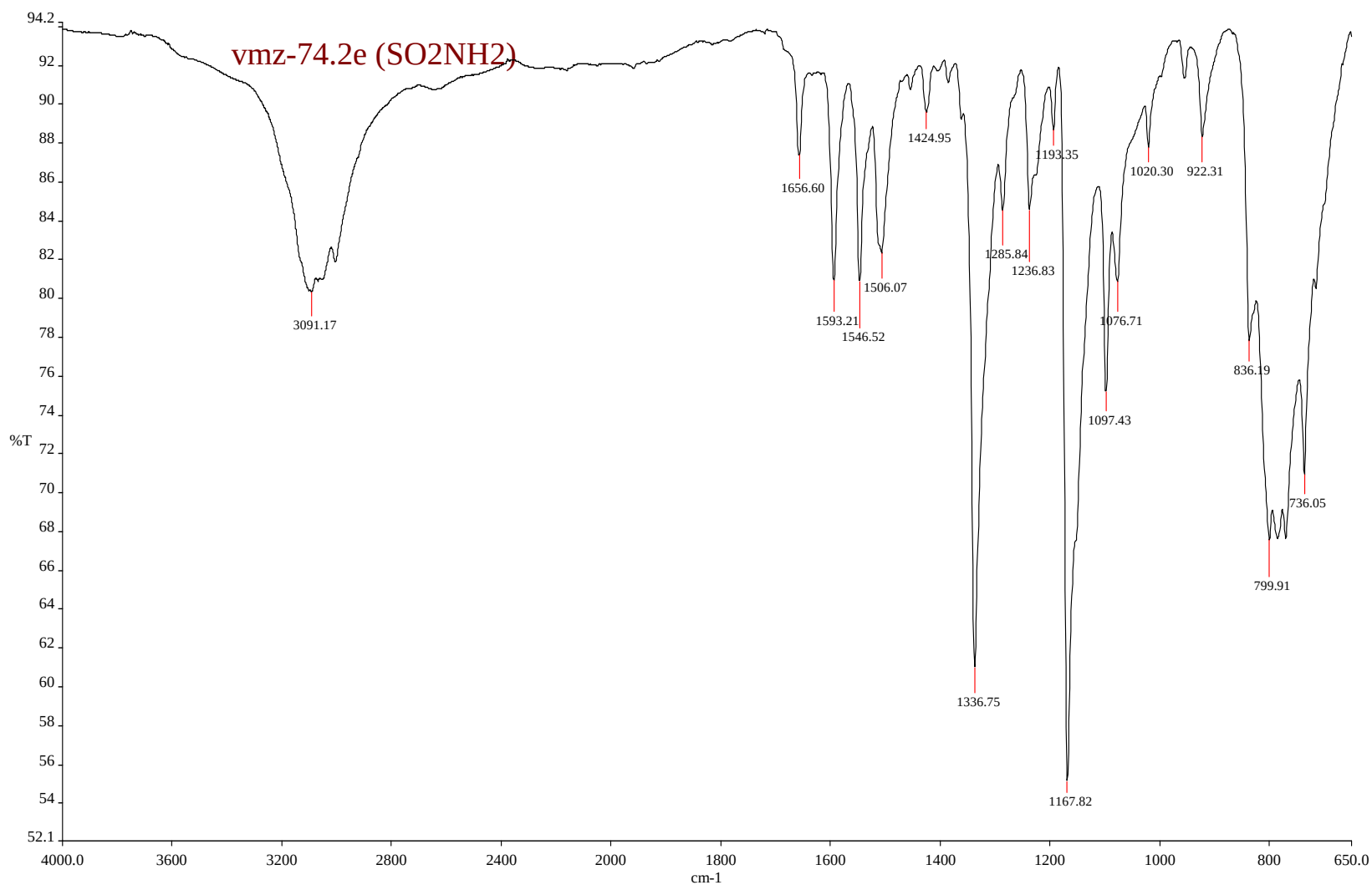


Plate 10c: HRMS spectrum of pyridyl[1,5-a]-4-sulfanilamidylimidazolium chloride (4.3j)

Elemental Composition Report

Page 1

Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 50.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions

32 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)

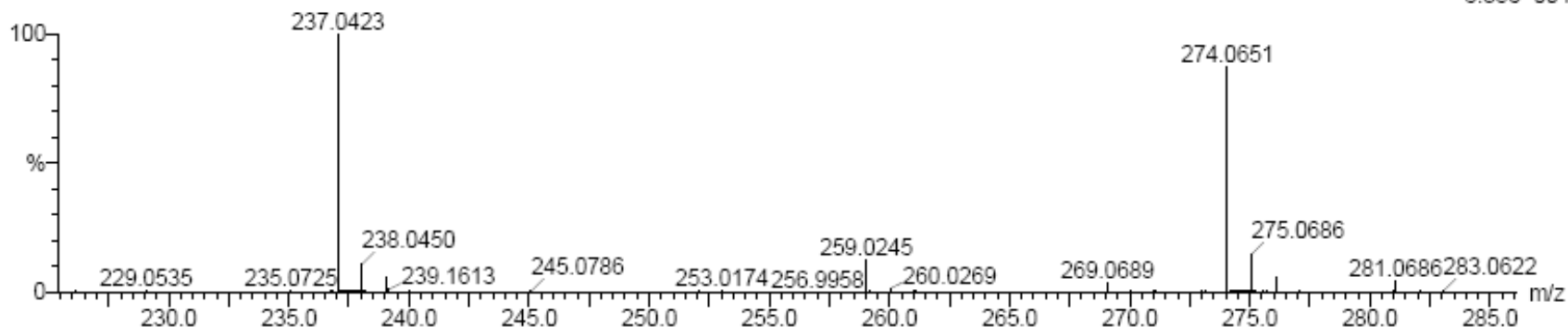
Elements Used:

C: 10-15 H: 10-15 N: 0-5 O: 0-5 S: 0-1

Vuyisa Mzozoyana

VMZ_74_2e 2 (0.017) Cm (1:26)

TOF MS ES+
8.35e+004



Minimum: -1.5
Maximum: 5.0 5.0 50.0

Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	i-FIT (Norm)	Formula
274.0651	274.0650	0.1	0.4	9.5	522.6	0.0	C13 H12 N3 O2 S

Plate 11: ^1H NMR spectrum of pyridyl[1,5-a]-4-sulphapyridylimidazolium chloride (**4.3k**)

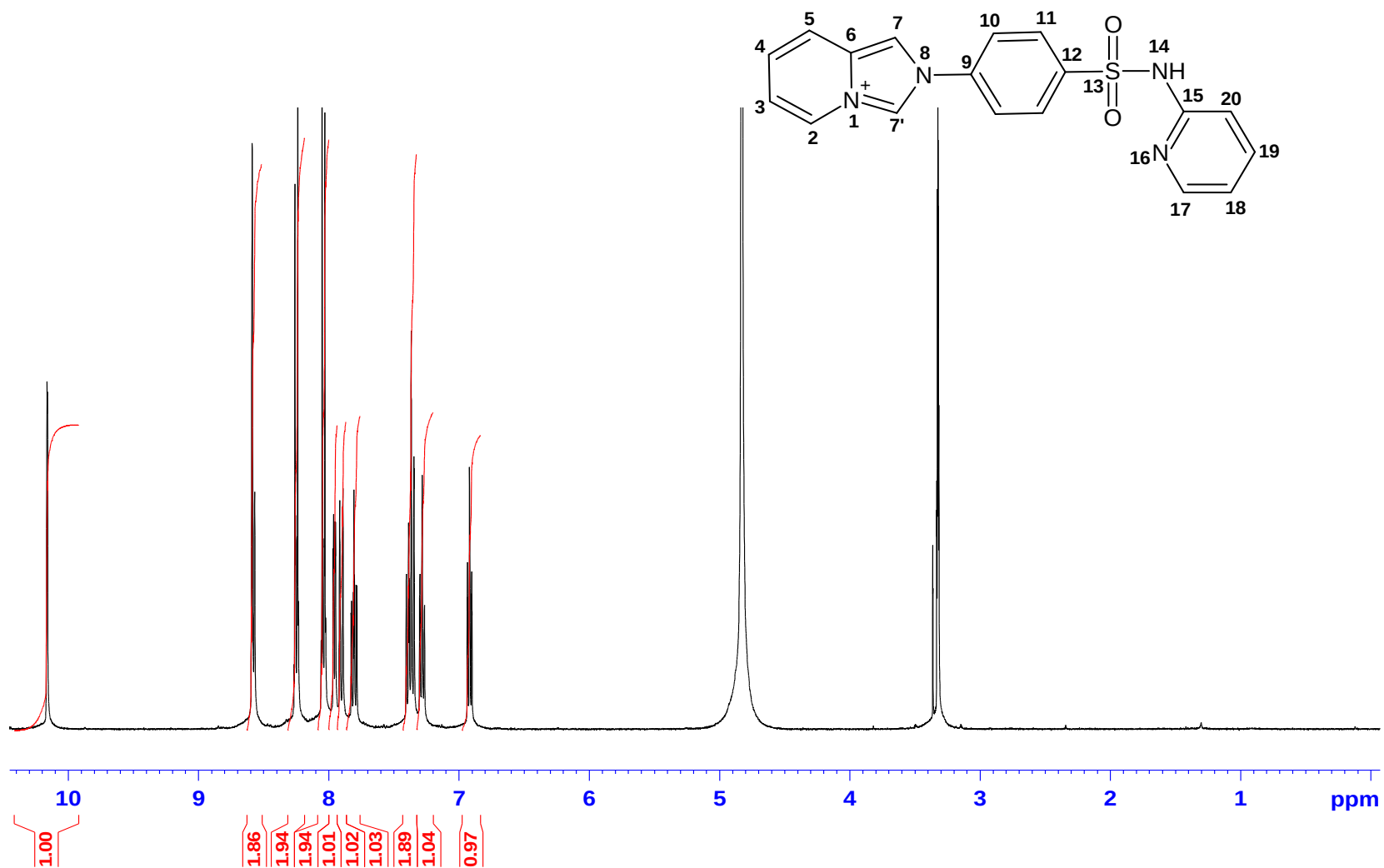


Plate 11a: ^{13}C NMR spectrum of pyridyl[1,5-*a*]-4-sulphapyridylimidazolium chloride (**4.3k**)

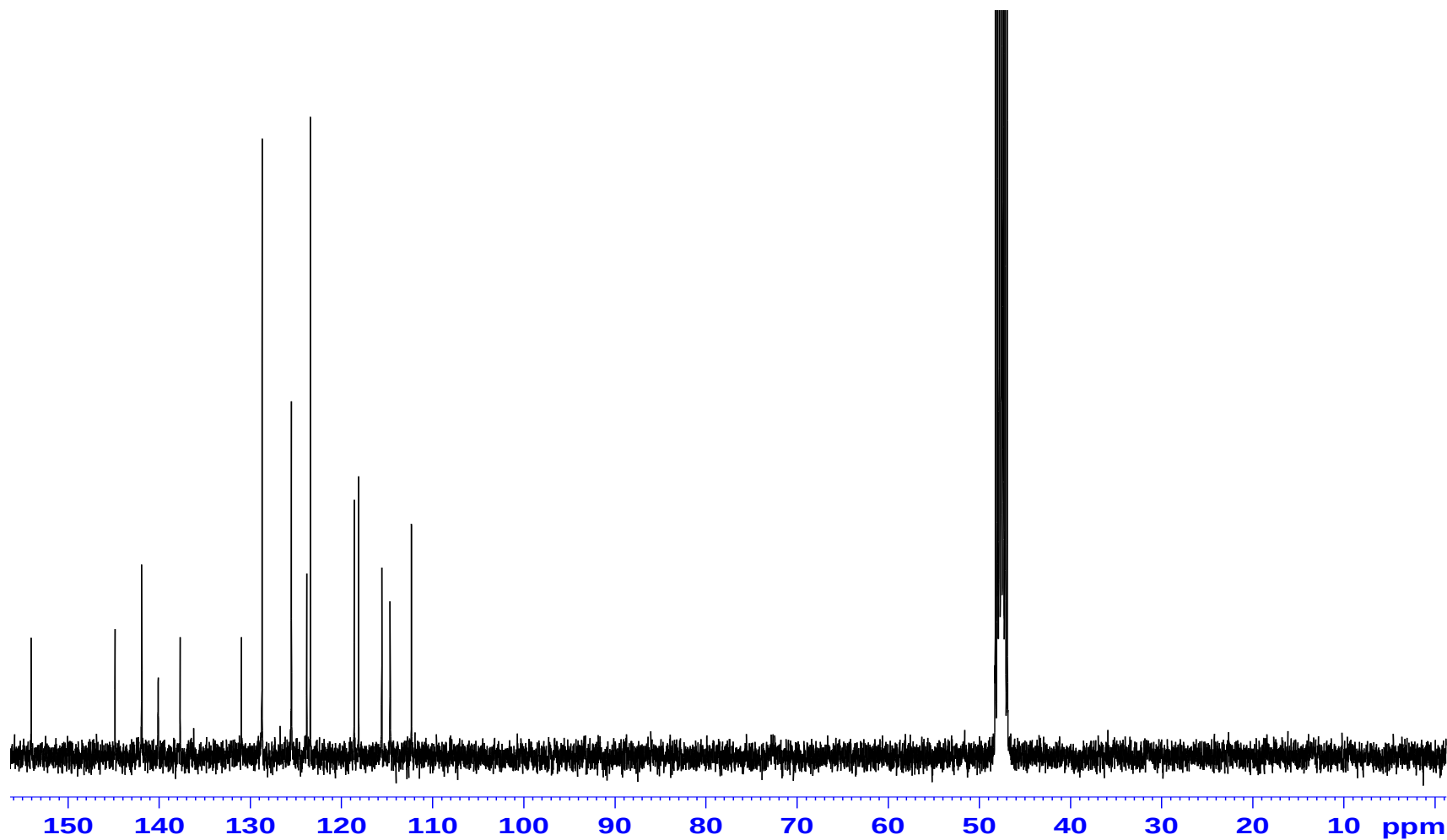


Plate 11b: IR spectrum of pyridyl[1,5-a]-4-sulphapyridylimidazolium chloride (**4.3k**)

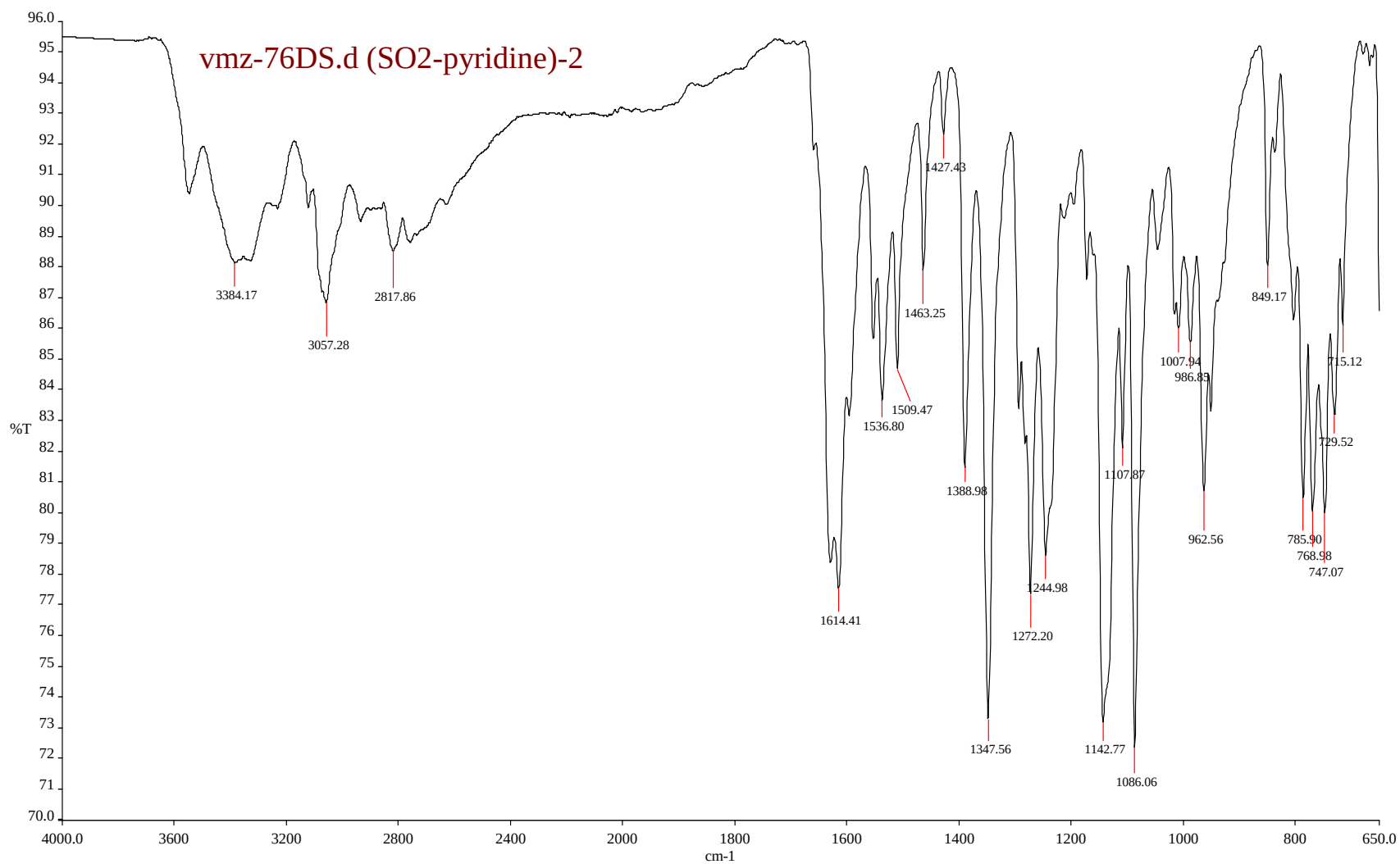


Plate 11c: HRMS spectrum of pyridyl[1,5-*a*]-4-sulphapyridylimidazolium chloride (4.3k)

Elemental Composition Report

Page 1

Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 50.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions

41 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)

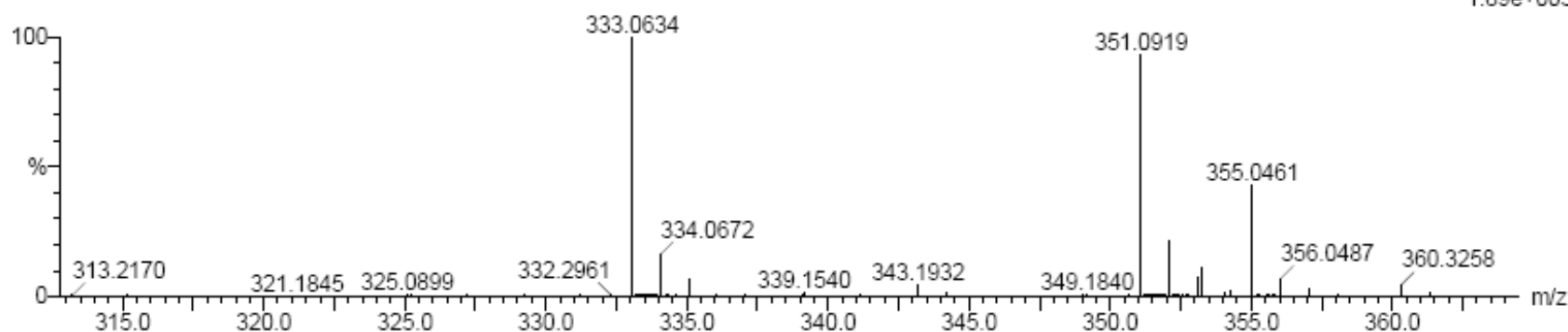
Elements Used:

C: 15-20 H: 10-20 N: 0-5 O: 0-5 S: 0-1

Vuyisa Mzozoyana

VMZ_76Bs_d 54 (0.905) Cm (1:60)

TOF MS ES+
1.89e+005



Minimum: -1.5
Maximum: 5.0 5.0 50.0

Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	i-FIT (Norm)	Formula
351.0919	351.0916	0.3	0.9	13.5	609.4	0.0	C18 H15 N4 O2 S

Plate 12: ^1H NMR spectrum of pyridyl[1,5-a]-4-(*m*-methyl)pheny-5-pyridylimidazolium chloride (**4.4a**)

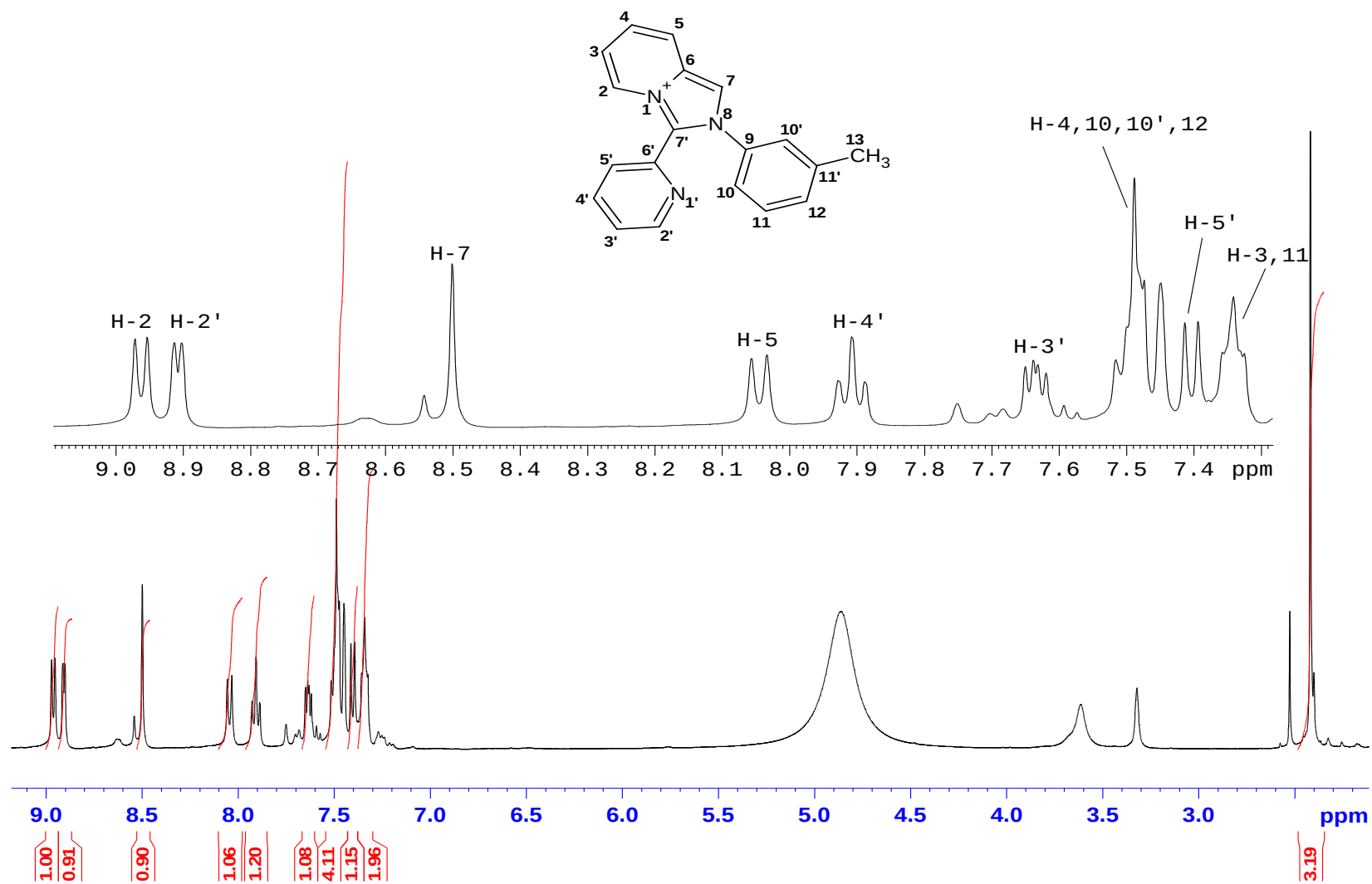


Plate 12a: ^{13}C NMR spectrum of pyridyl[1,5-*a*]-4-(*m*-methyl)pheny-5-pyridylimidazolium chloride (**4.4a**)

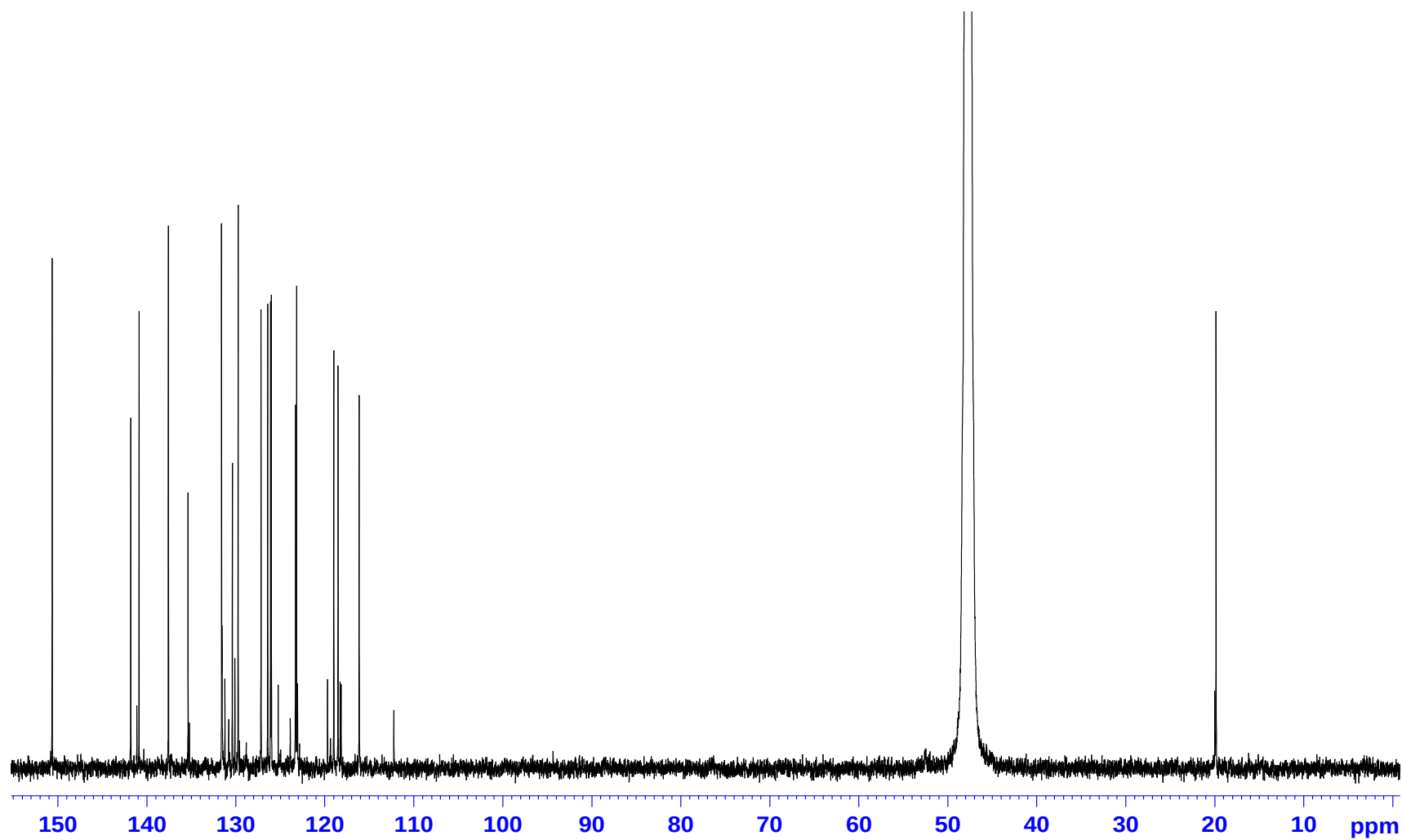


Plate 13: ^1H NMR spectrum of pyridyl[1,5-*a*]-4-(*p*-*N,N*-Diethyl)pheny-5-pyridylimidazolium chloride (**4.4b**)

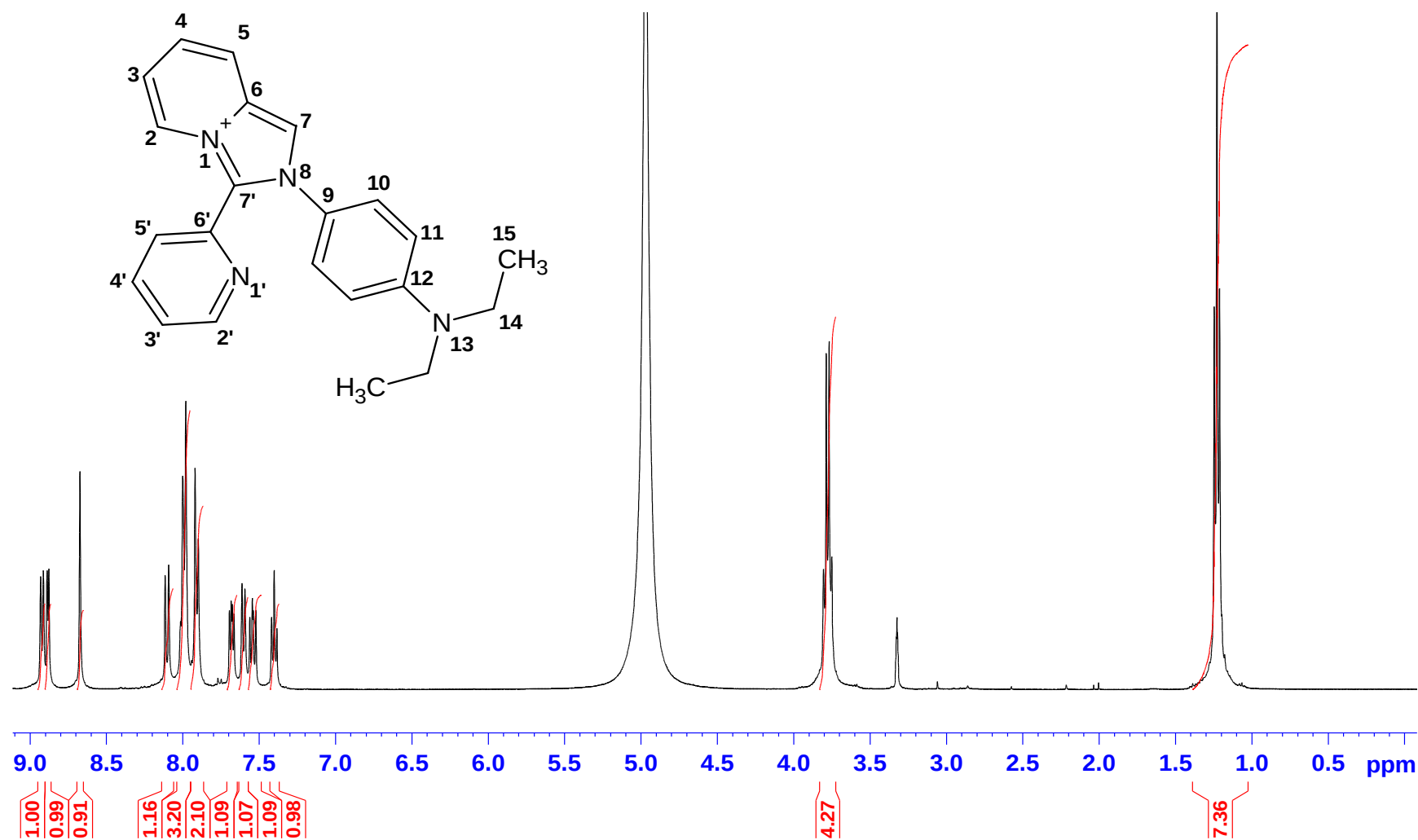


Plate 13a: ^{13}C Dept 135 NMR spectrum of pyridyl[1,5-*a*]-4-(*p*-*N,N*-Diethyl)pheny-5-pyridylimidazolium chloride (**4.4b**)

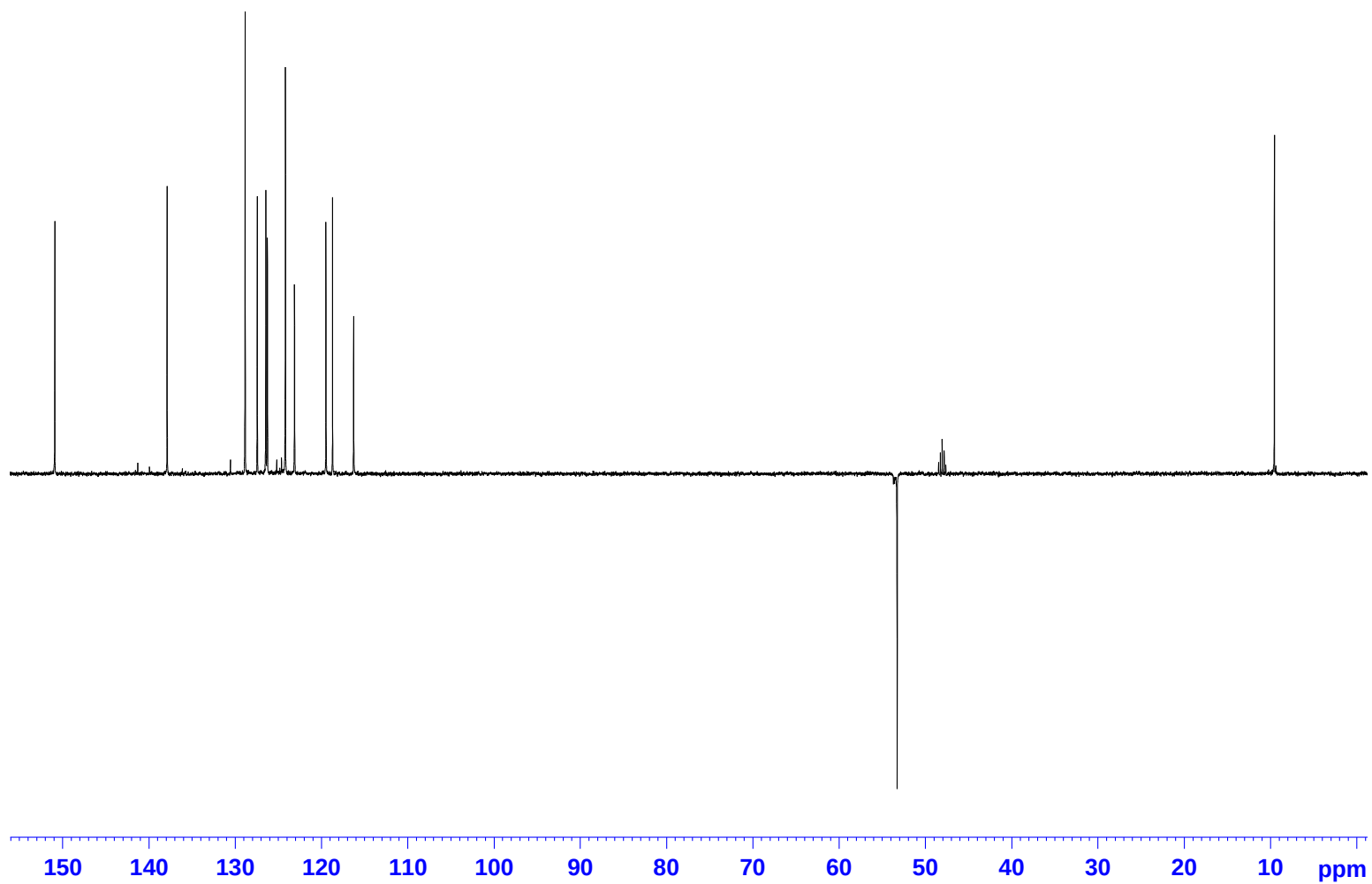


Plate 13b: IR spectrum of pyridyl[1,5-*a*]-4-(*p*-*N,N*-Diethyl)pheny-5-pyridylimidazolium chloride (**4.4b**)

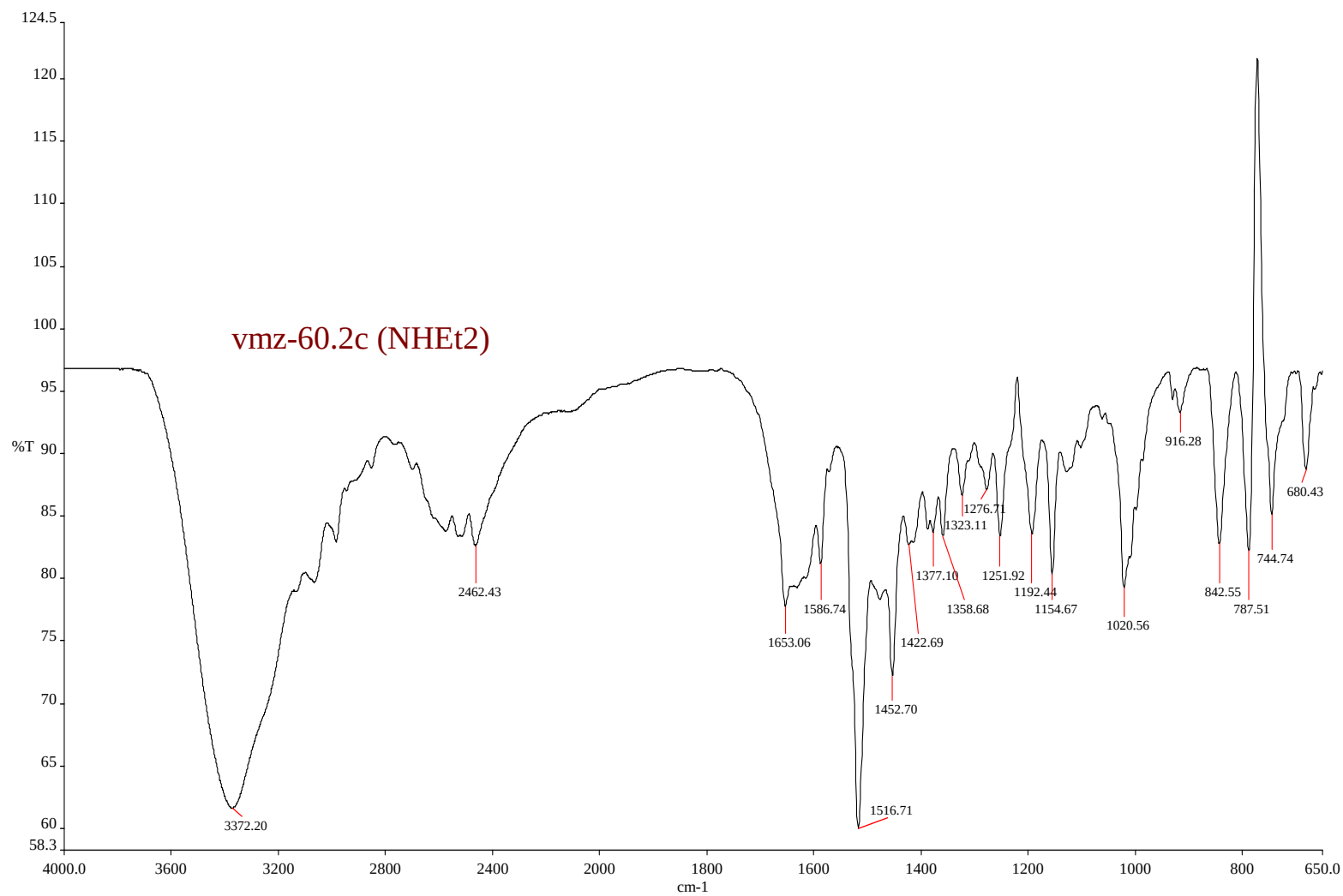


Plate 13c: HRMS spectrum of pyridyl[1,5-*a*]-4-(*p*-*N,N*-Diethyl)pheny-5-pyridylimidazolium chloride (4.4b)

Elemental Composition Report

Page 1

Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 50.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions

3 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)

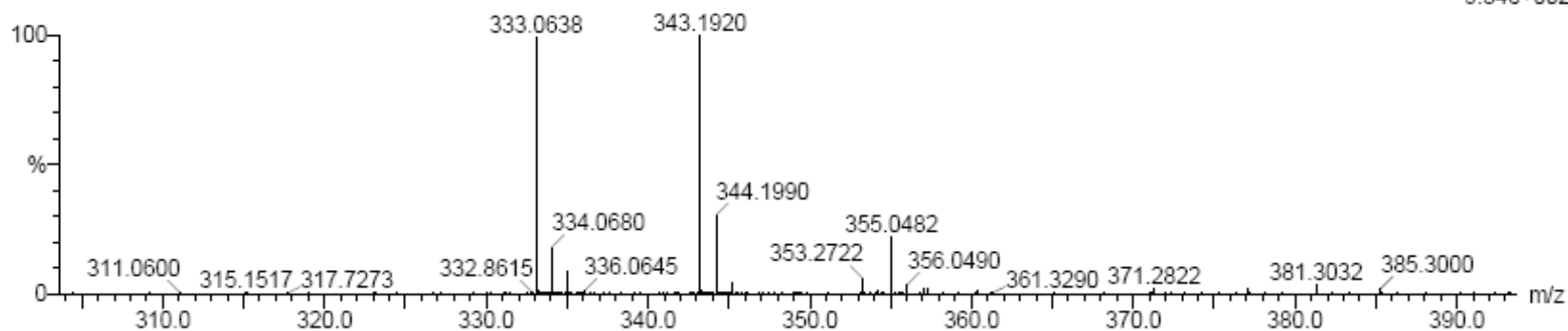
Elements Used:

C: 20-25 H: 20-25 N: 0-5

Vuyisa Mzozoyana

VMZ_60_2cb 3 (0.034)

TOF MS ES+
9.34e+002



Minimum:

Maximum:

5.0 5.0 -1.5
50.0

Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	i-FIT (Norm)	Formula
343.1920	343.1923	-0.3	-0.9	13.5	92.3	0.0	C22 H23 N4