

## **Supplementary Materials**

### **$\alpha$ -Hydroxylactams as efficient entries to diversely functionalized ferrociphenols: Synthesis and anticancer activity studies**

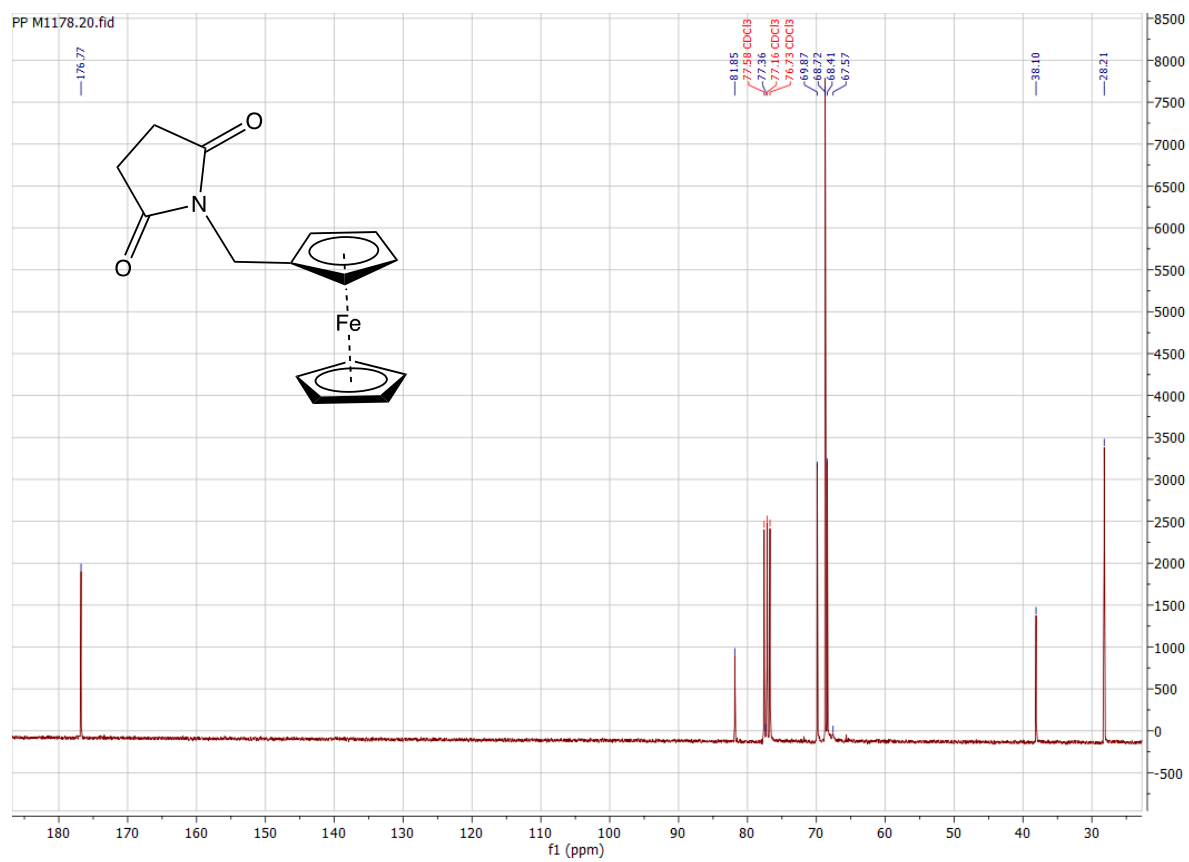
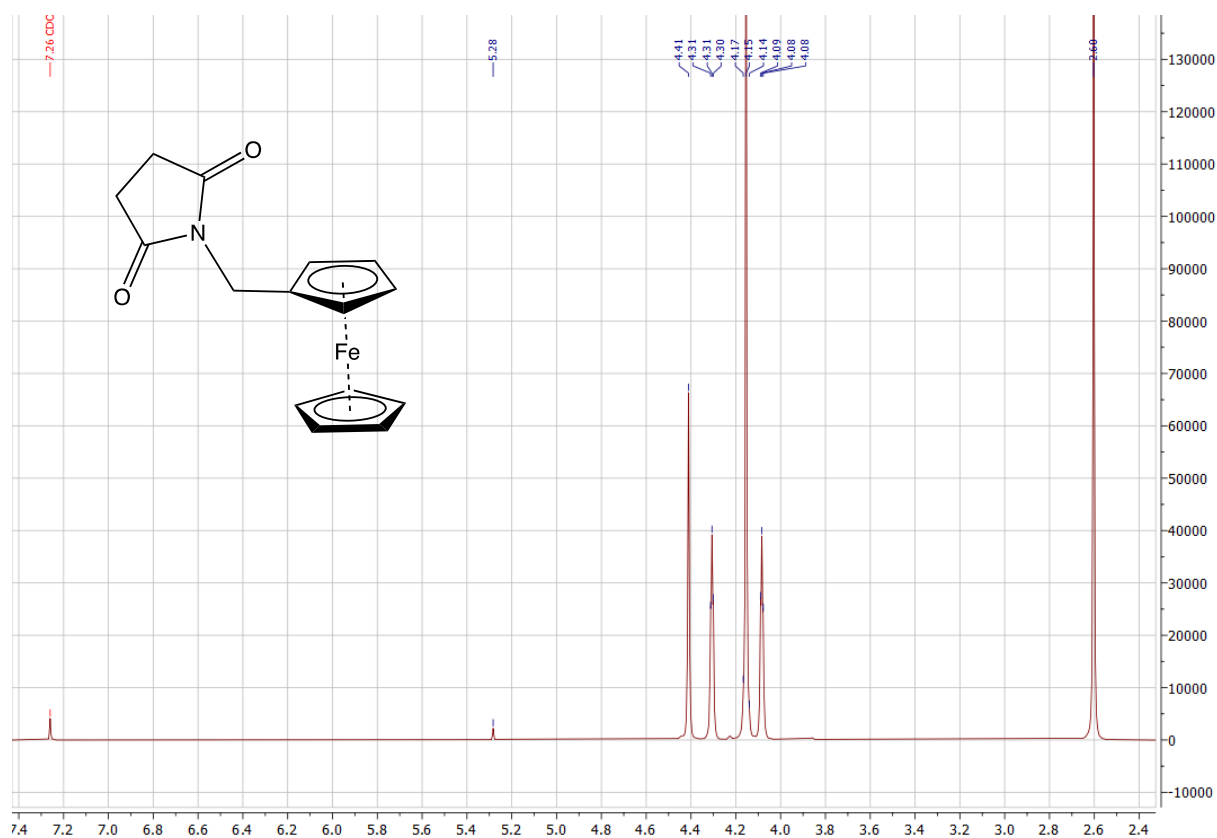
Pascal Pigeon, Marie Gaschard, Mohamed Othman, Michèle Salmain and Gérard Jaouen

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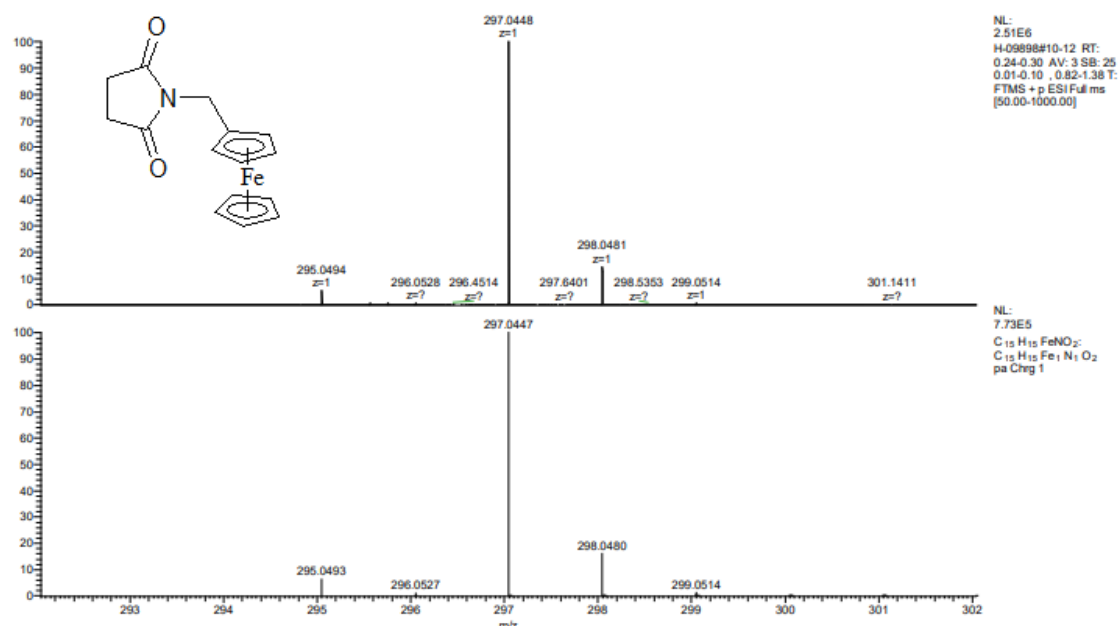
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**Figure S1:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **3a**



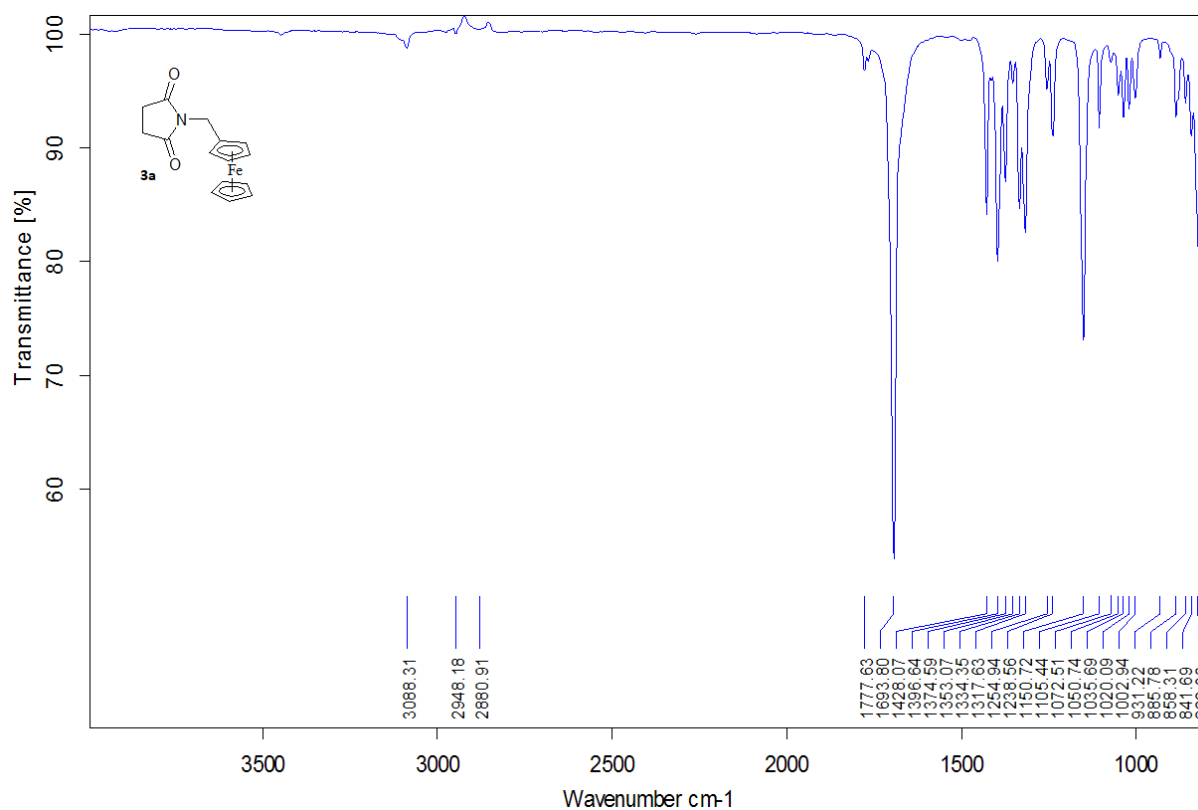




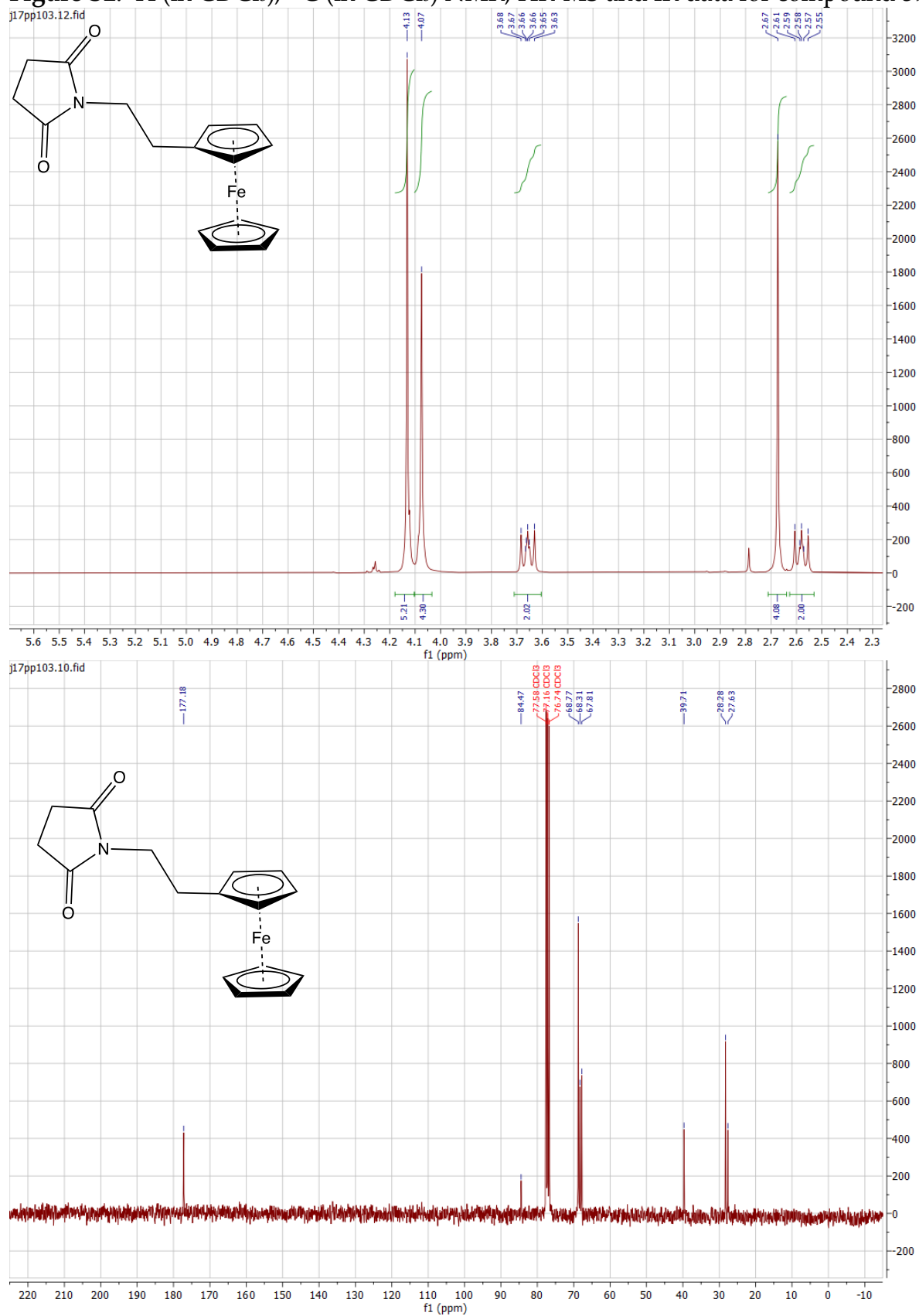
## Experimental/theoretical isotopic pattern MS spectrum

Error = 0.4 ppm; Relative Intensity (%) 100

HRMS (ESI) m/z: [M]<sup>+</sup> Calcd for C<sub>15</sub>H<sub>15</sub>FeNO<sub>2</sub> 297.0447 . Found 297.0448; (Error: 0.4 ppm).



**Figure S2:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **3b**



# Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 100.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 9

Monoisotopic Mass, Odd Electron Ions

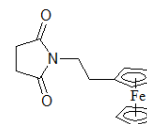
291 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)

Elements Used:

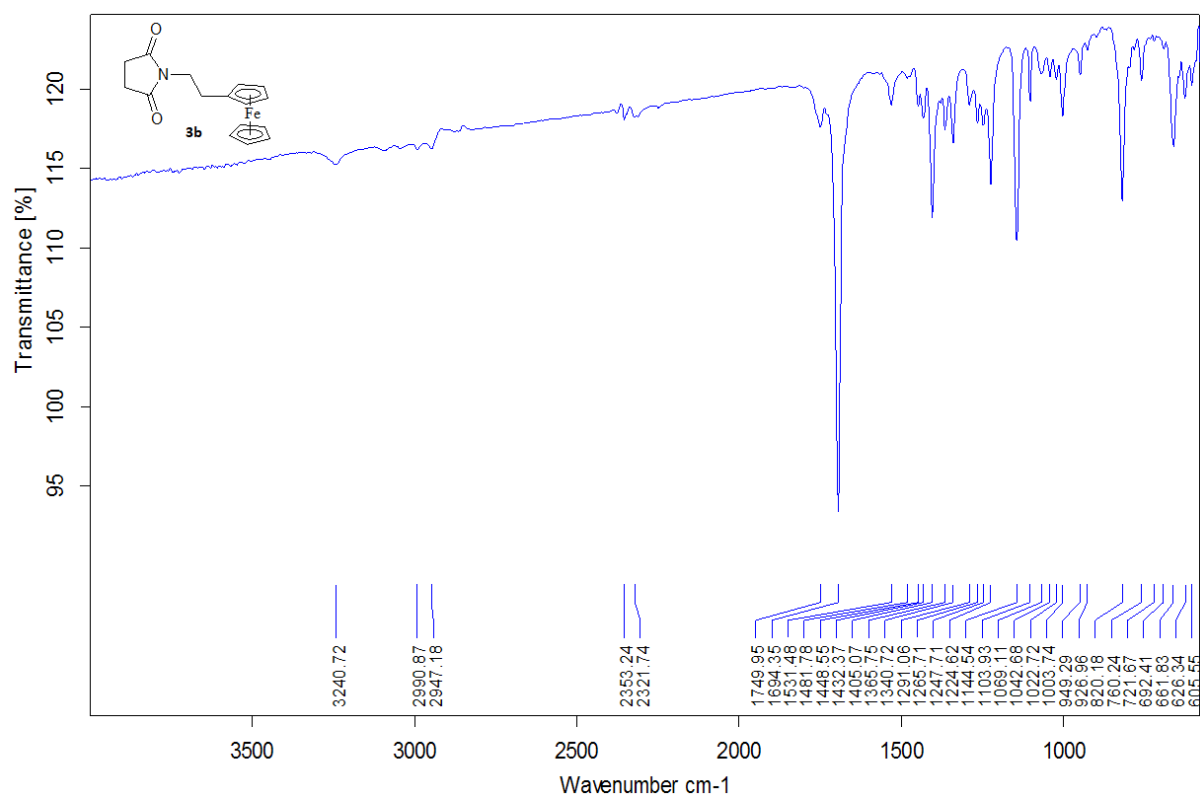
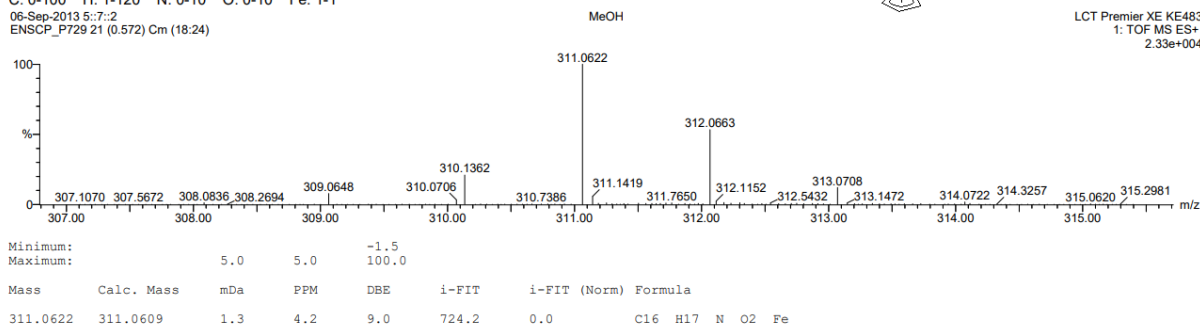
C: 0-100 H: 1-120 N: 0-10 O: 0-10 Fe: 1-1

06-Sep-2013 5:7:22

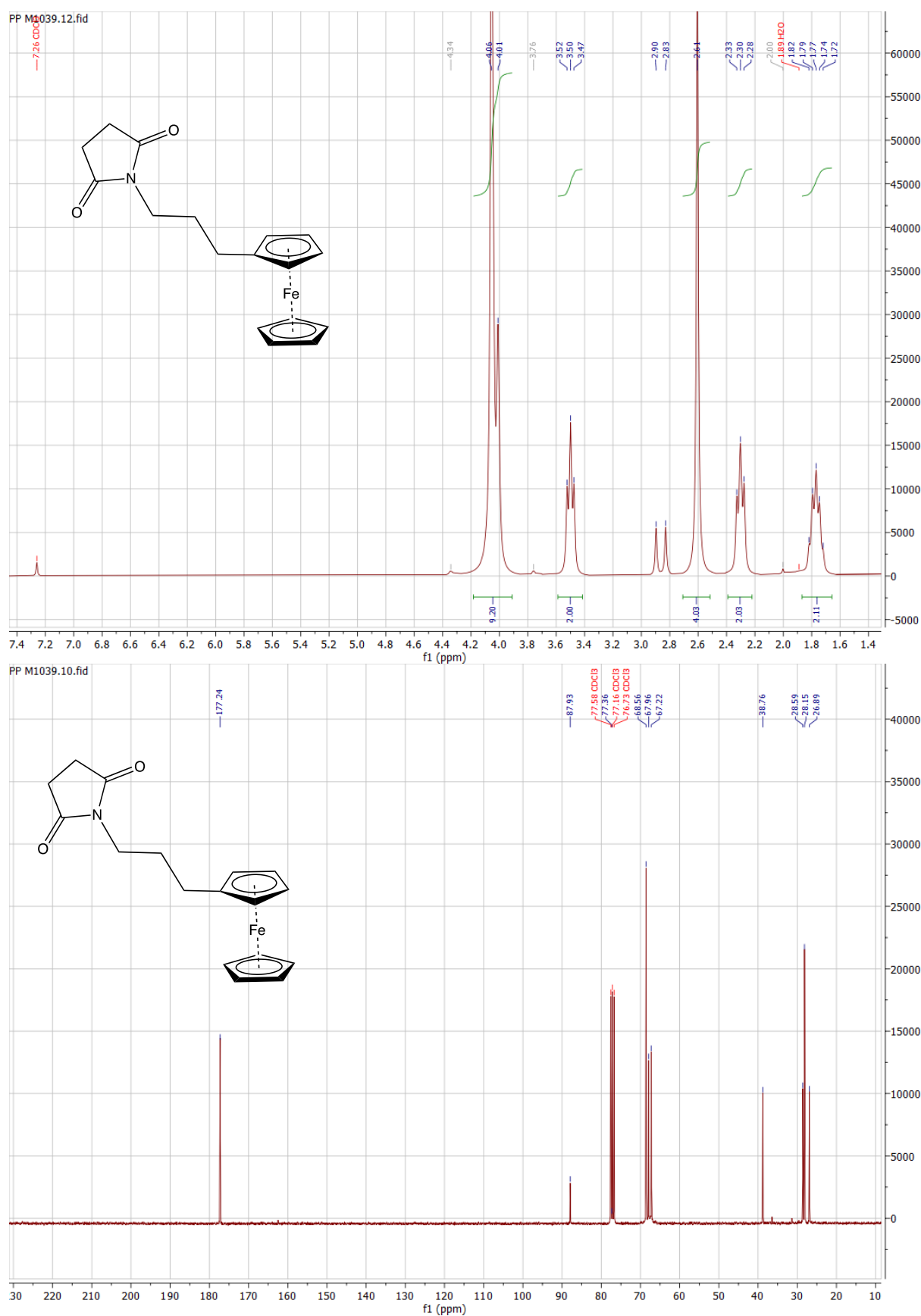
ENSCP\_P729 21 (0.572) Cm (18:24)

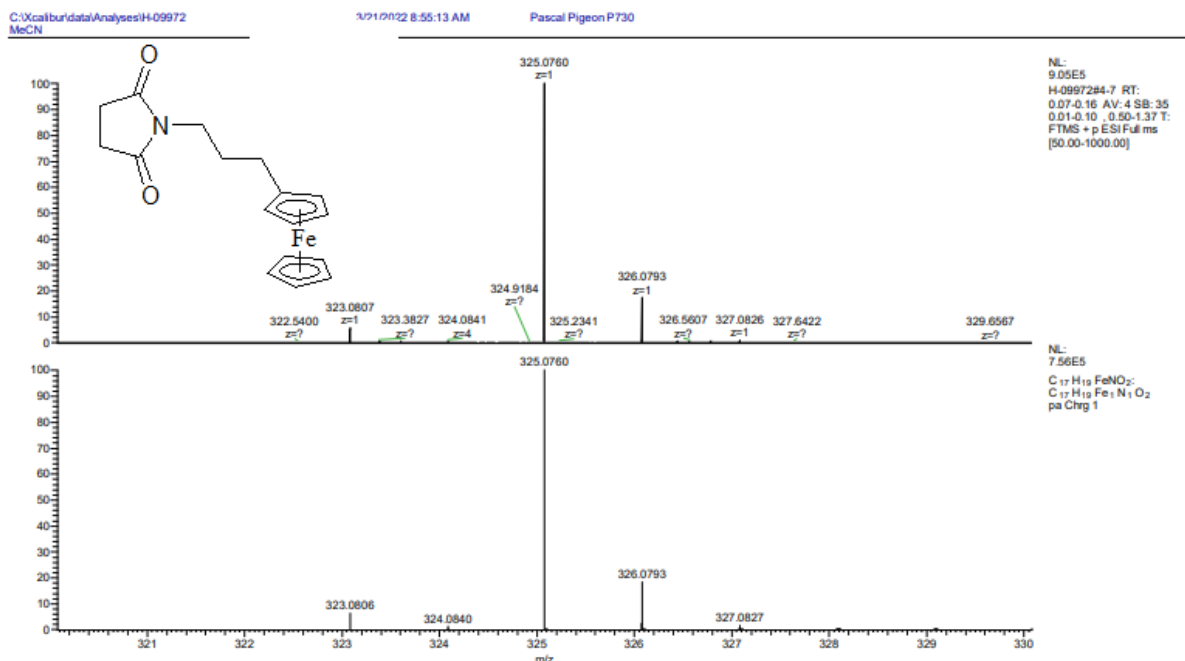


LCT Premier XE KE483  
1: TOF MS ES+  
2.33e+004



**Figure S3:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **3c**

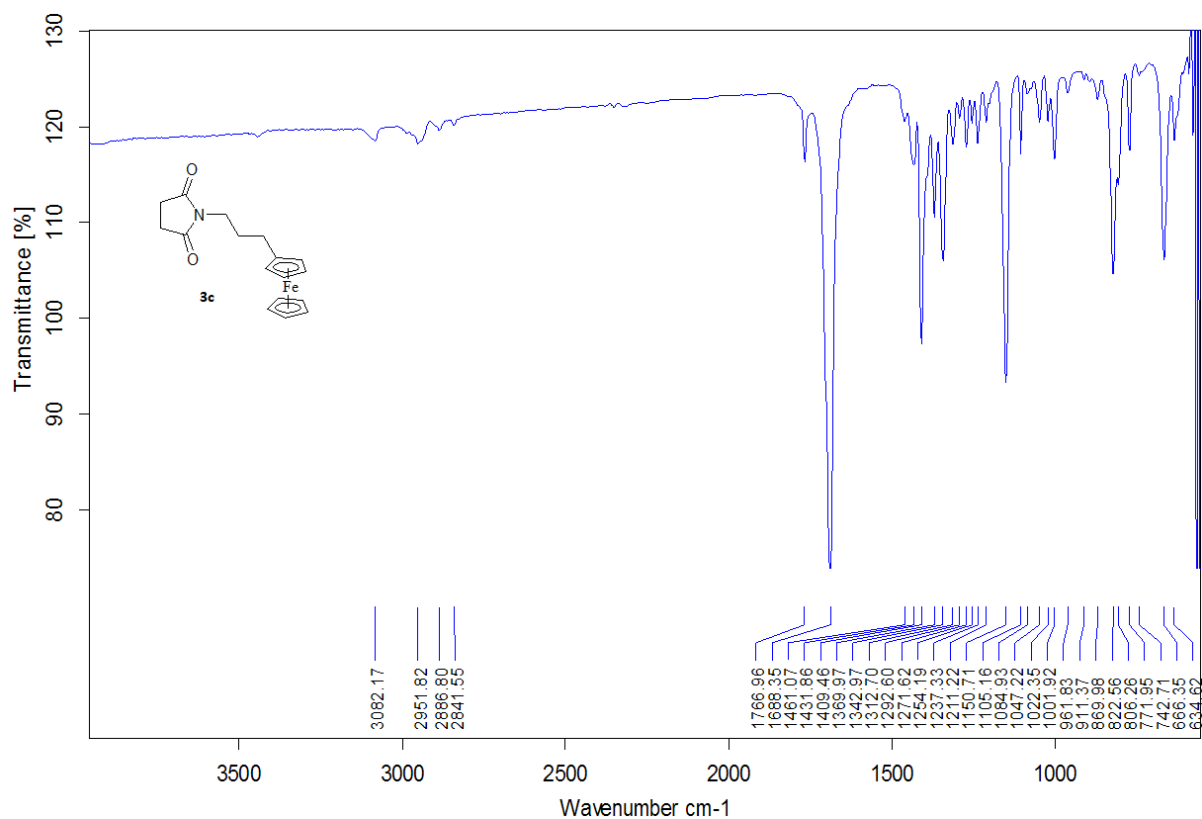




## Experimental/theoretical isotopic pattern MS spectrum

Error = 0.1 ppm; Relative Intensity (%) 100

HRMS (ESI) m/z: [M]<sup>+</sup> Calcd for C<sub>17</sub>H<sub>19</sub>FeNO<sub>2</sub> 325.0760 . Found 325.076; (Error: 0.1 ppm).



**Figure S4: HR-MS and IR data for compound 3d**

**Single Mass Analysis**

Tolerance = 5.0 PPM // DBE: min = -1.5, max = 100.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 9

Monoisotopic Mass, Odd Electron Ions

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

Elements Used:

C: 0-100 H: 1-120 N: 0-10 O: 0-10 Fe: 1-1

06-Sep-2013 5:00:0

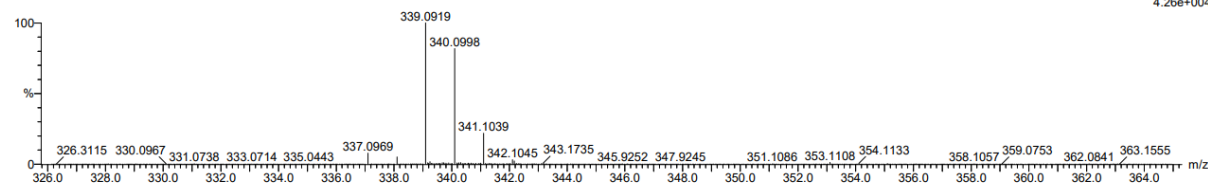
ENSCP\_P731 21 (0.571) Cm (19:28)

MeOH

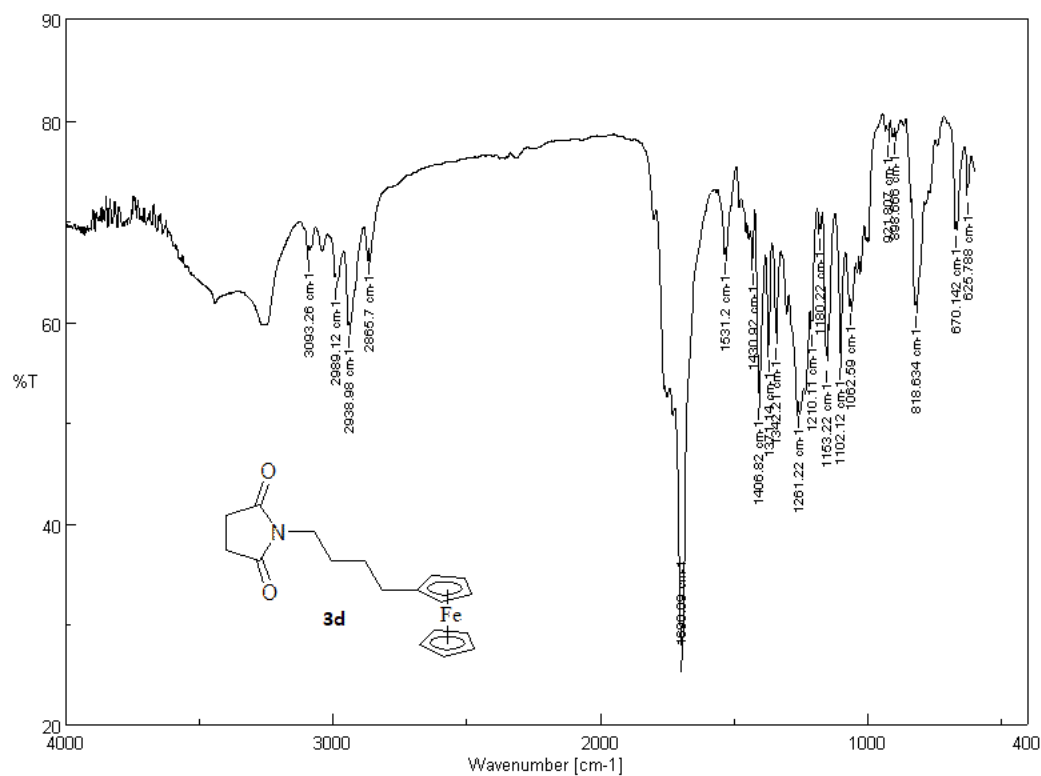
LCT Premier XE KE483

1: TOF MS ES+

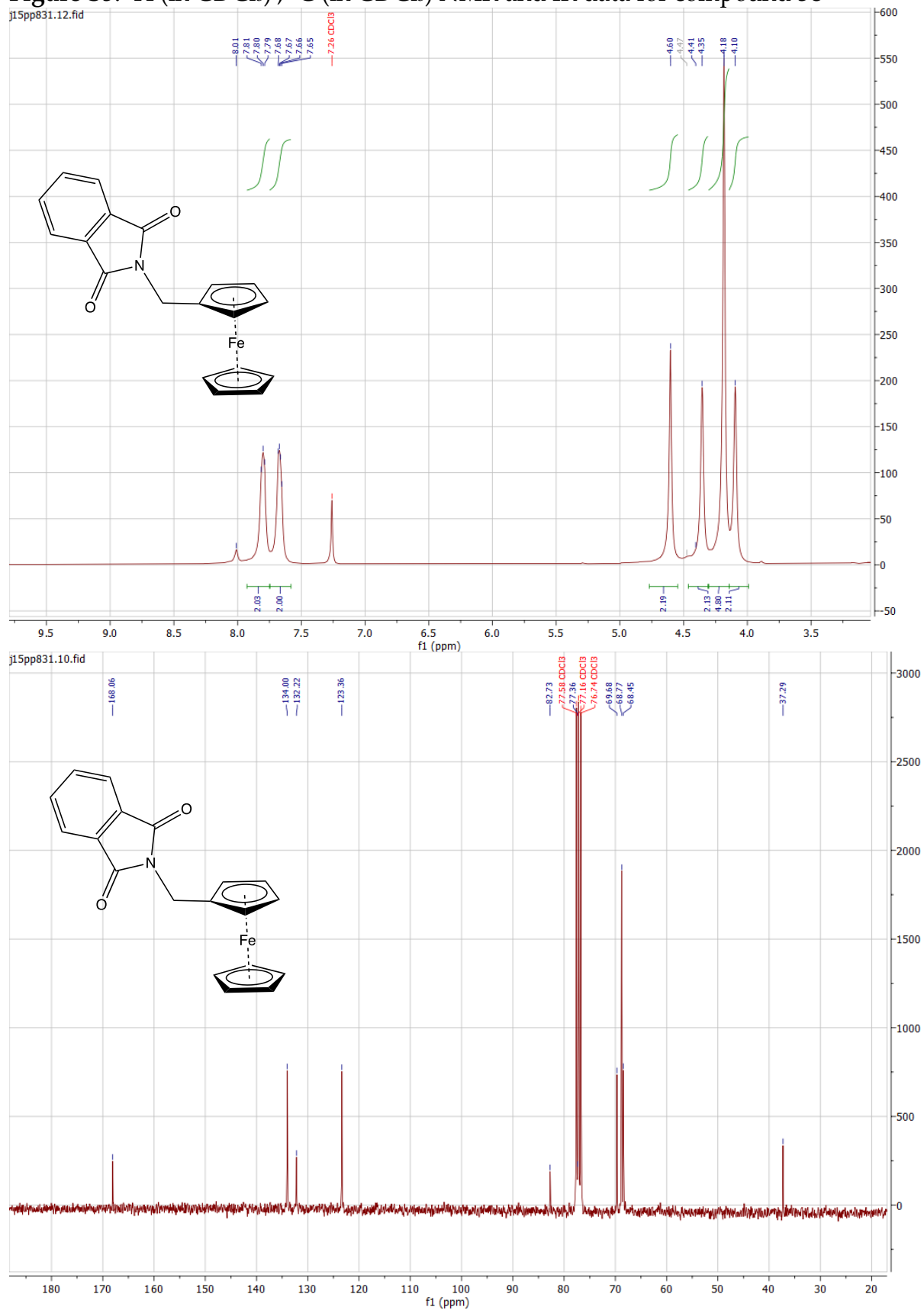
4.26e+004

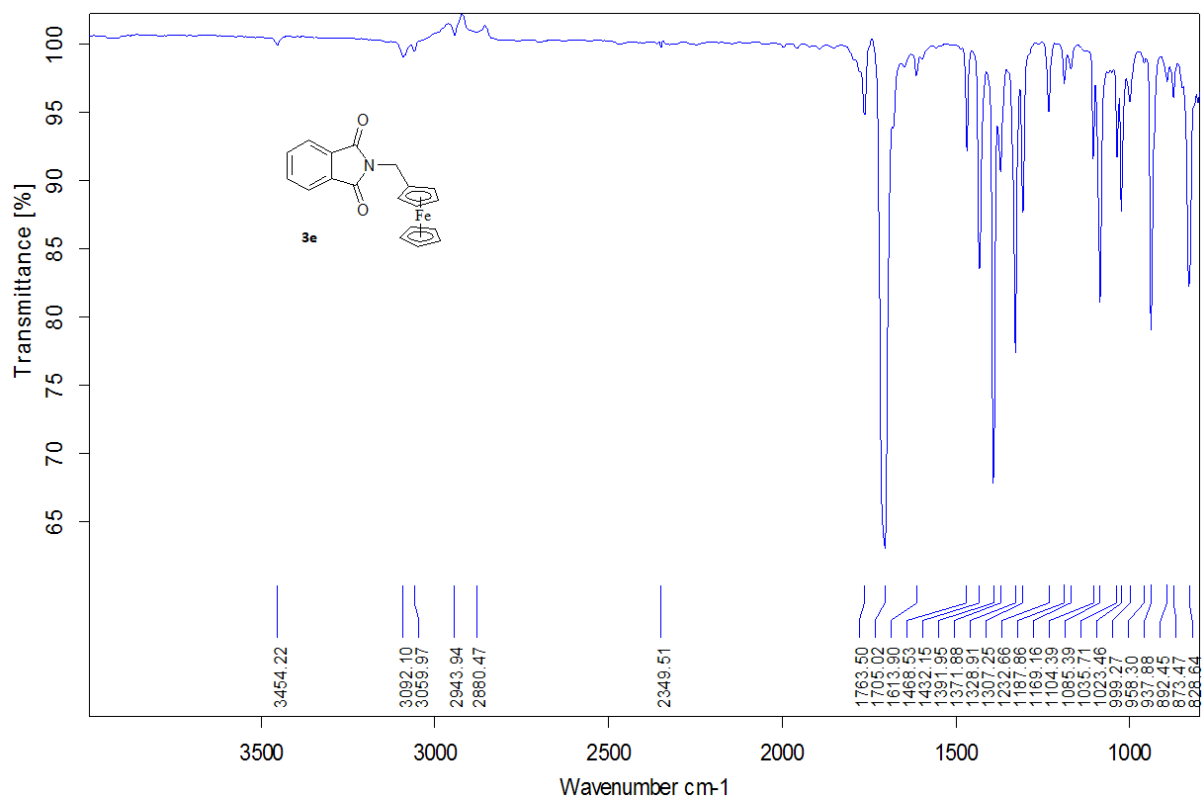


Minimum:										
Maximum:	5.0	5.0	-1.5	100.0						
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	i-FIT (Norm)	Formula			
339.0919	339.0922	-0.3	-0.9	9.0	1253.4	0.0	C18 H21 N O2 Fe			



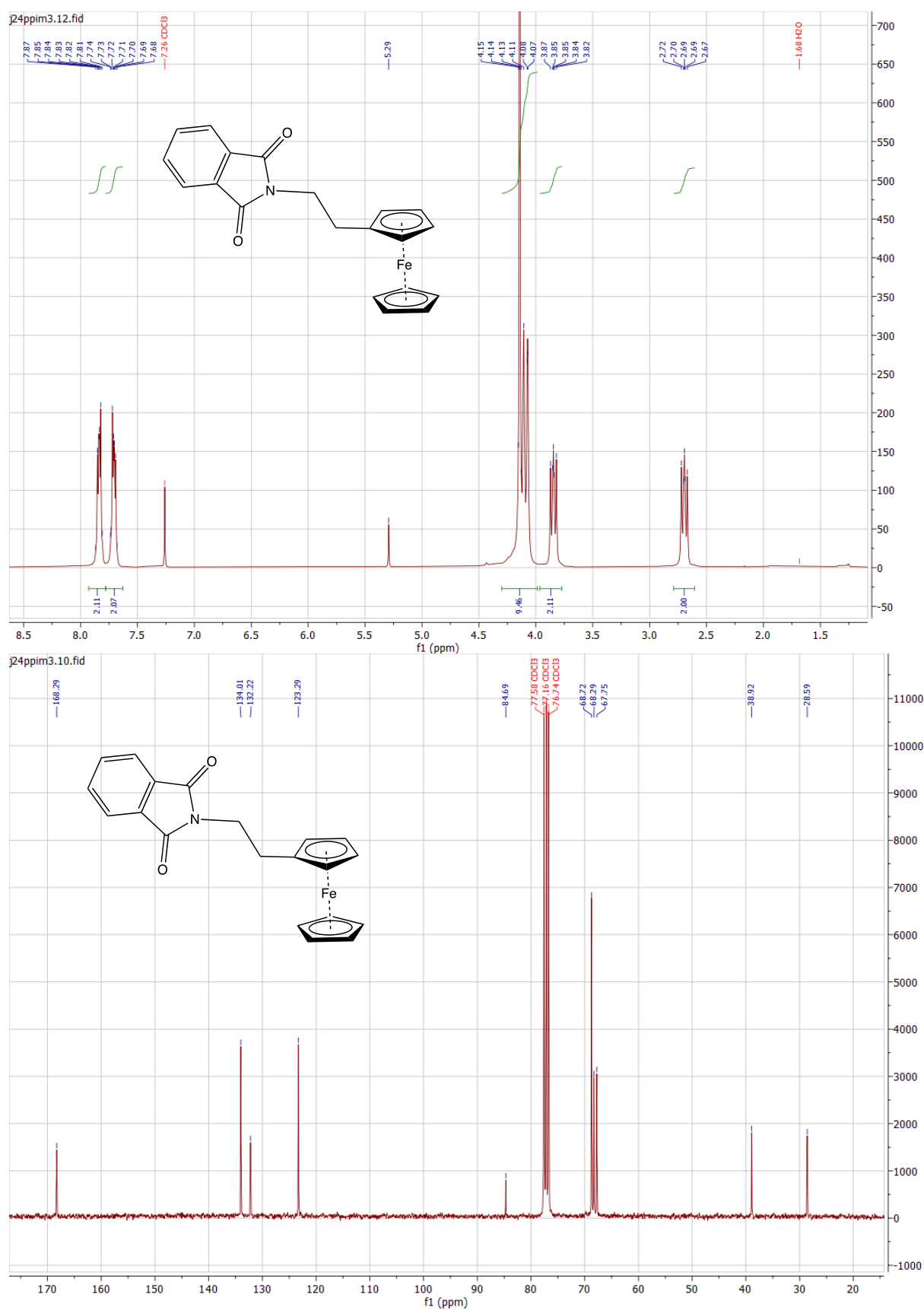
**Figure S5:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR and IR data for compound **3e**







**Figure S6:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR HR-MS and IR for compound **3f**



# Single Mass Analysis

Tolerance = 5.0 PPM // DBE: min = -1.5, max = 100.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 9

Monoisotopic Mass, Odd Electron Ions

365 formula(e) evaluated with 2 results within limits (all results (up to 1000) for each mass)

Elements Used:

C: 0-100 H: 1-120 N: 0-10 O: 0-10 Fe: 1-1

06-Sep-2013 5:29:2

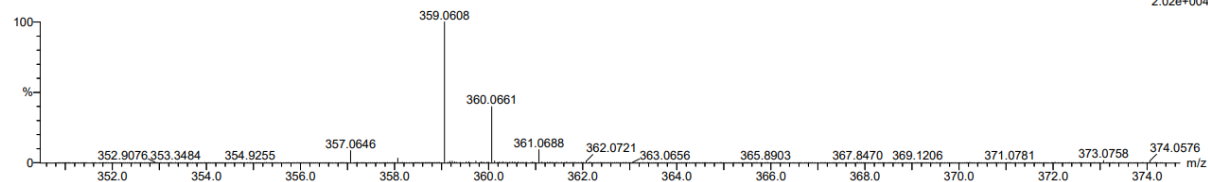
ENSCP\_P654 28 (0.714) Cm (28:39)

MeOH

LCT Premier XE KE483

1: TOF MS ES+

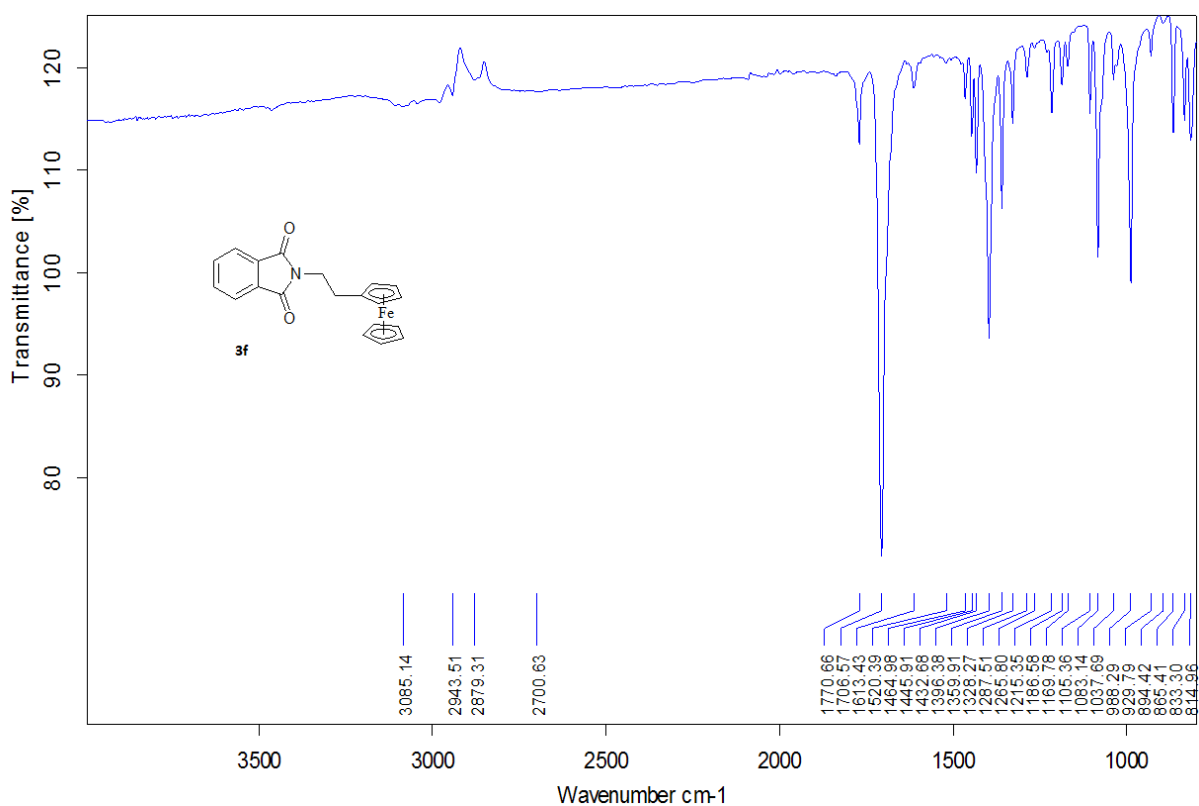
2.02e+004



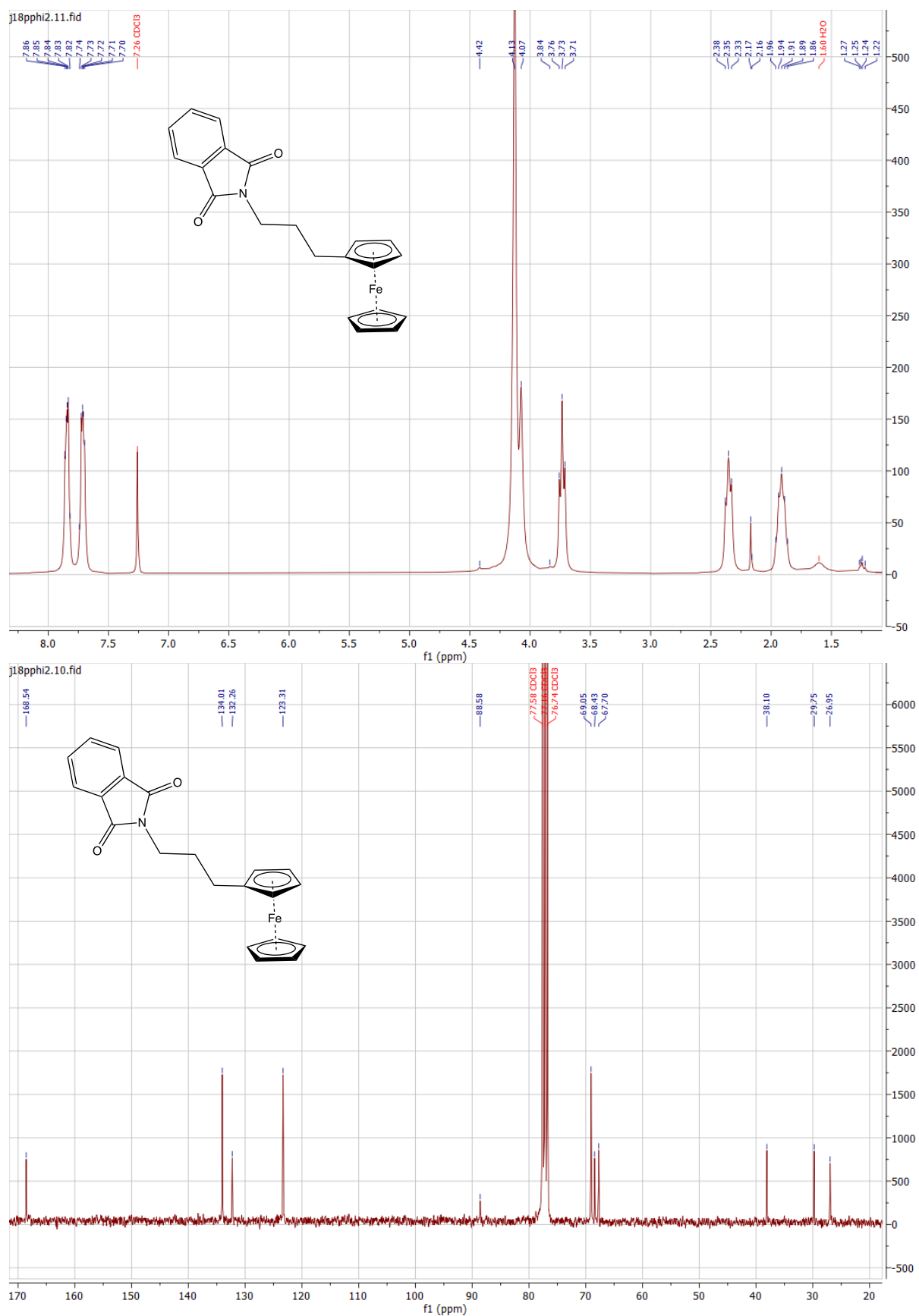
Minimum:

Maximum:

Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	i-FIT (Norm)	Formula
359.0608	359.0609	-0.1	-0.3	13.0	920.5	0.0	C20 H17 N O2 Fe
359.0608	359.0600	0.8	2.2	1.0	930.3	9.7	C4 H17 N9 O7 Fe



**Figure S7:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **3g**



# Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 100.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 9

Monoisotopic Mass, Odd Electron Ions

156 formula(e) evaluated with 2 results within limits (all results (up to 1000) for each mass)

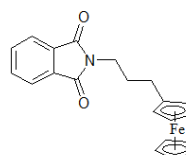
Elements Used:

C: 1-150 H: 1-150 N: 0-3 O: 0-10 Fe: 1-1

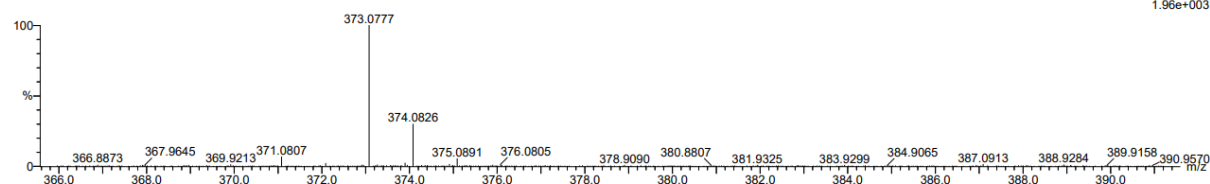
19-Jun-2013 3:22:0

ENSCP\_P659 57 (1.384) Cm (55:60)

ACN



LCT Premier XE KE483  
1: TOF MS ES+  
1.96e+003

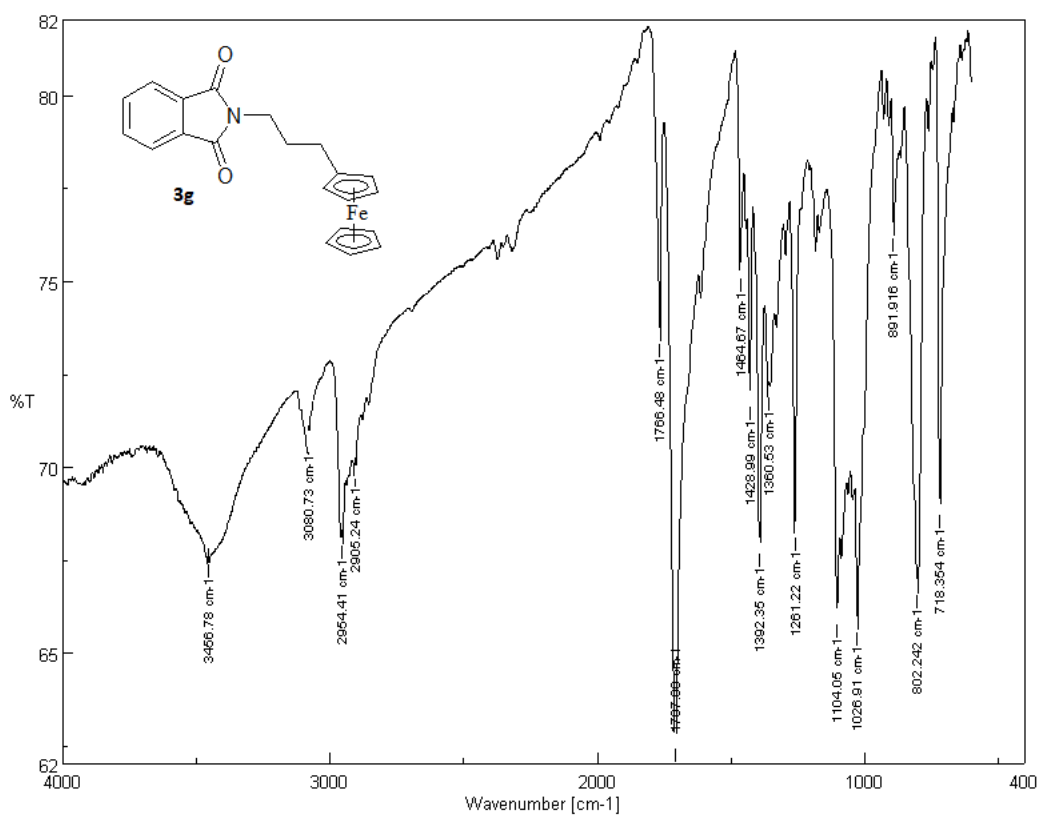


Minimum:

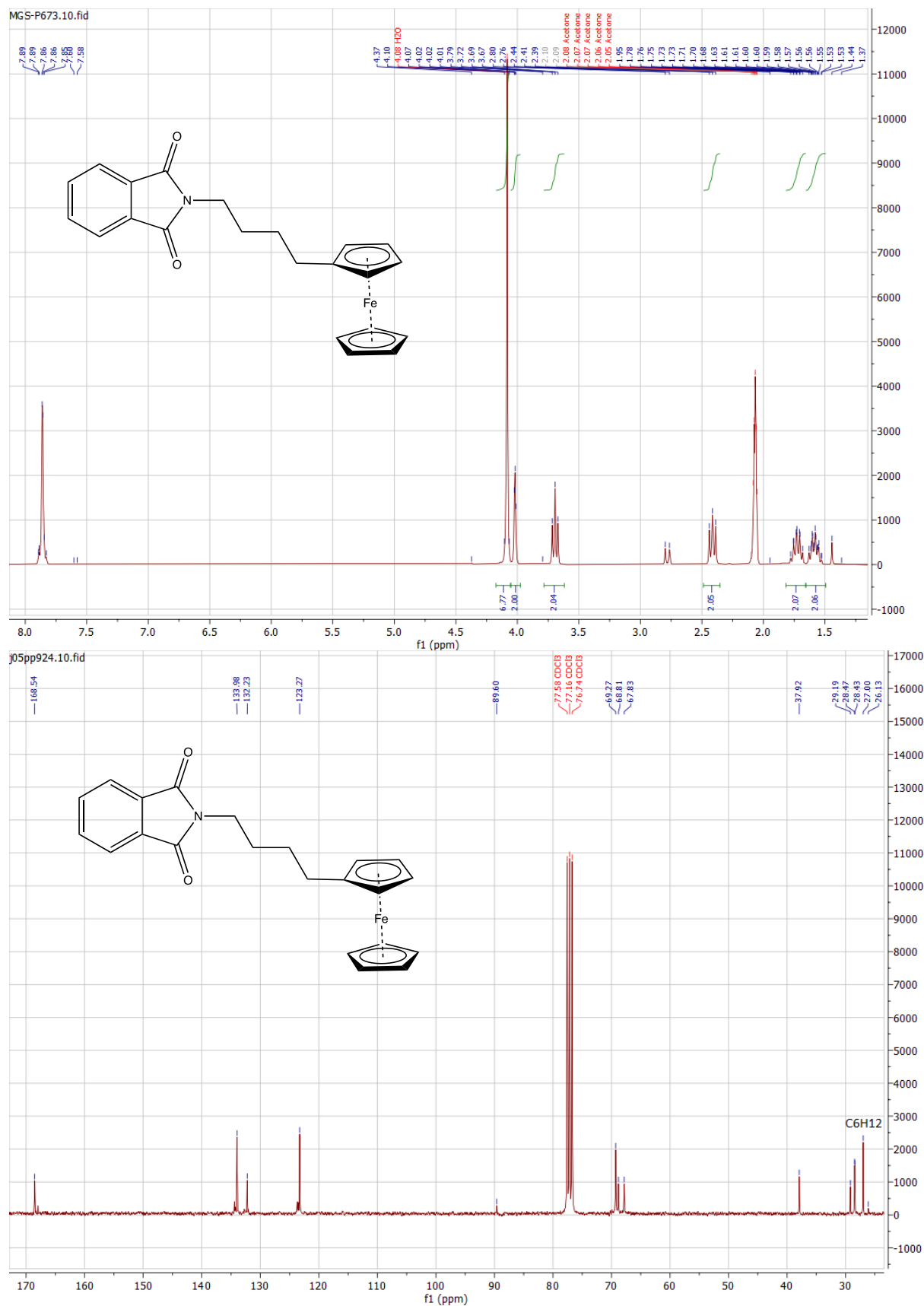
Maximum:

Mass Calc. Mass mDa PPM DBE i-FIT i-FIT (Norm) Formula

Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	i-FIT (Norm)	Formula
373.0777	373.0765	1.2	3.2	13.0	457.1	0.0	C21 H19 N O2 Fe
	373.0784	-0.7	-1.9	0.0	463.7	6.6	C9 H23 N3 O9 Fe

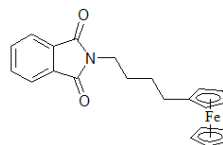


**Figure S8:**  $^1\text{H}$  (in acetone- $d_6$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **3h**



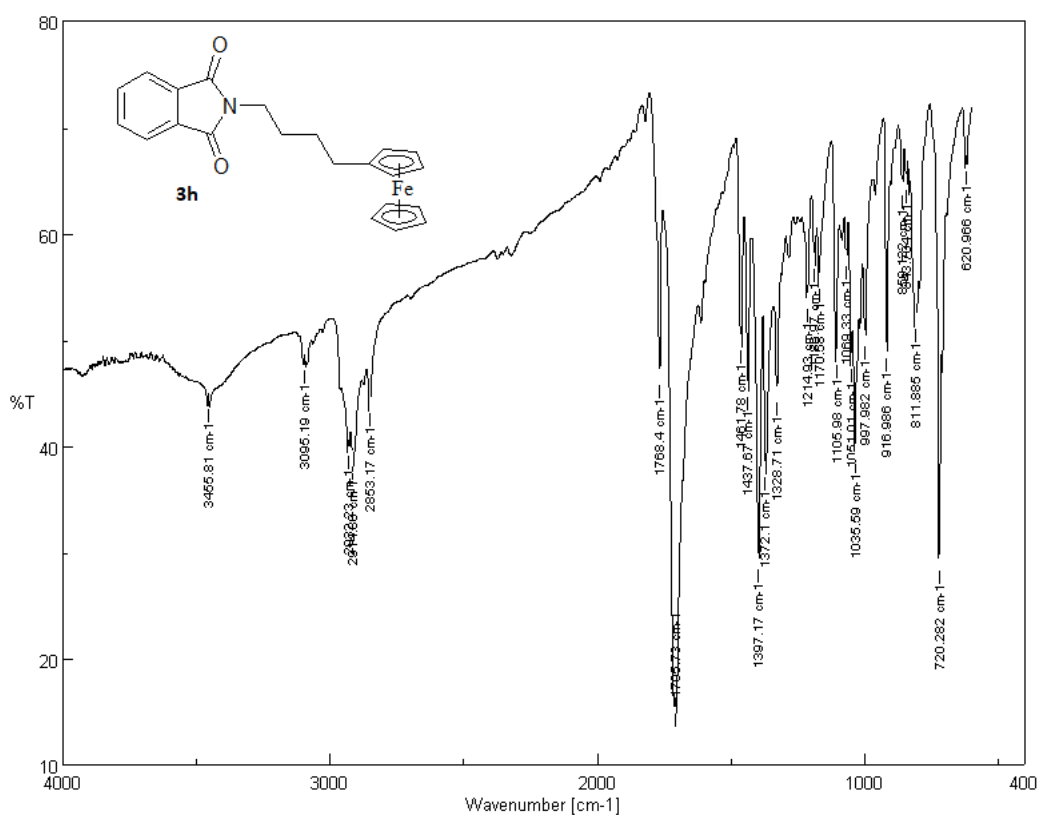
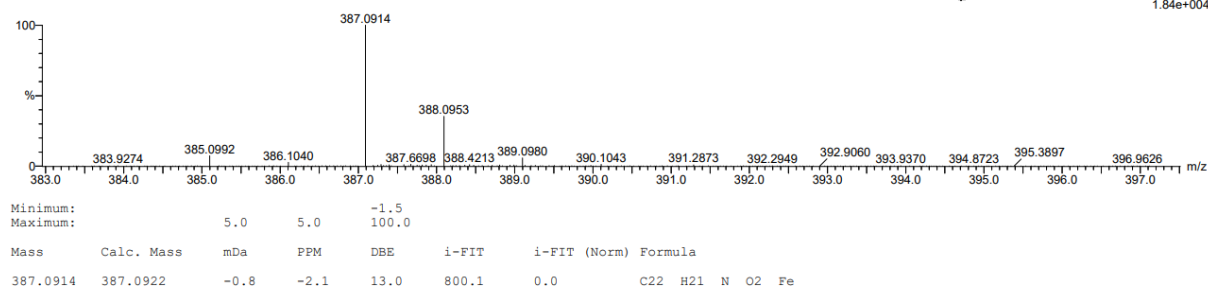
Tolerance = 5.0 PPM / DBE: min = -1.5, max = 100.0  
Element prediction: Off  
Number of isotope peaks used for i-FIT = 9

Monoisotopic Mass, Odd Electron Ions  
 164 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)  
 Elements Used:  
 C: 1-150 H: 1-150 N: 0-3 O: 0-10 Fe: 1-1  
 19-Jun-2013 2:4:4  
 ENSCP\_P673 49 (1.204) Cm (47.54)

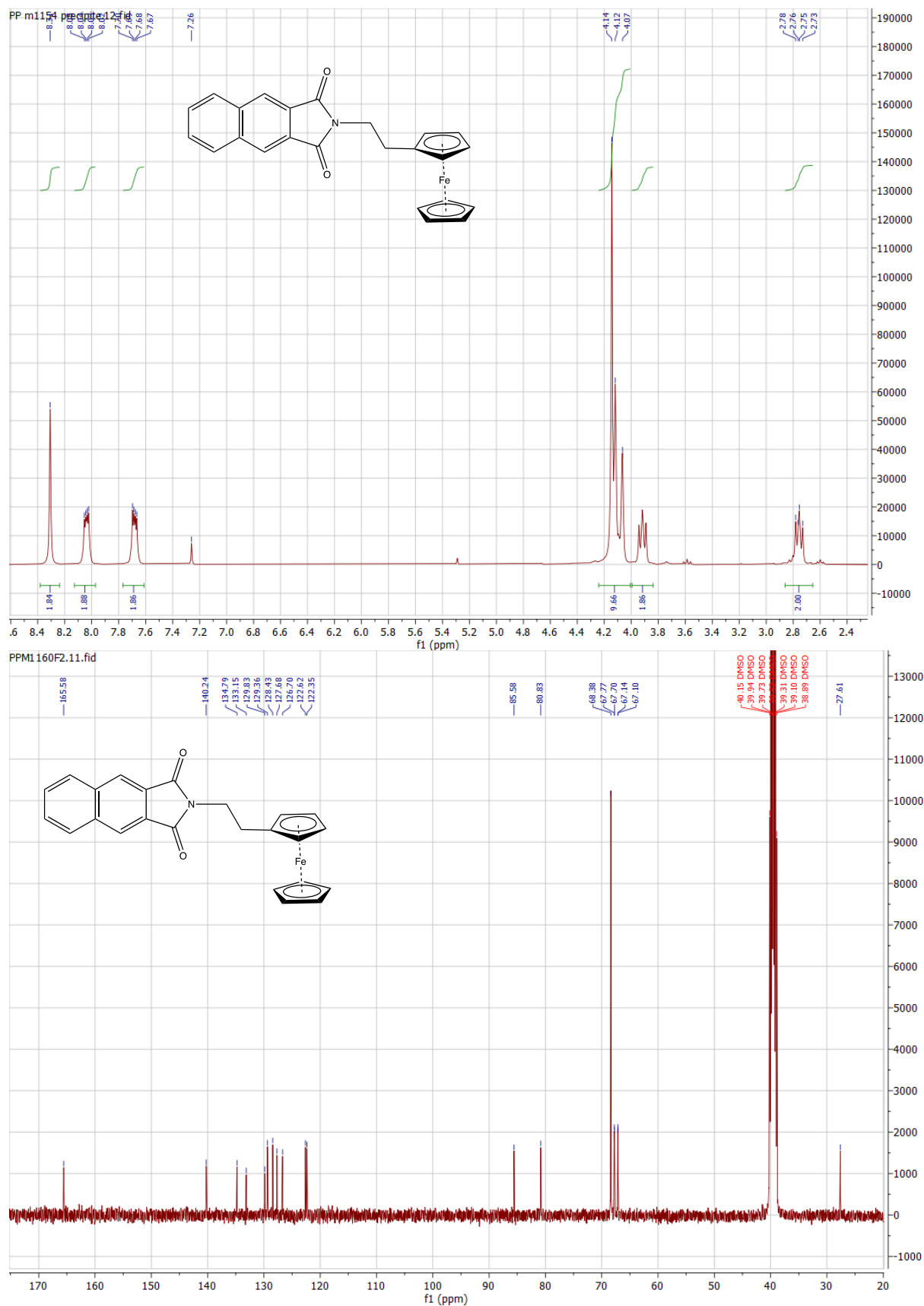


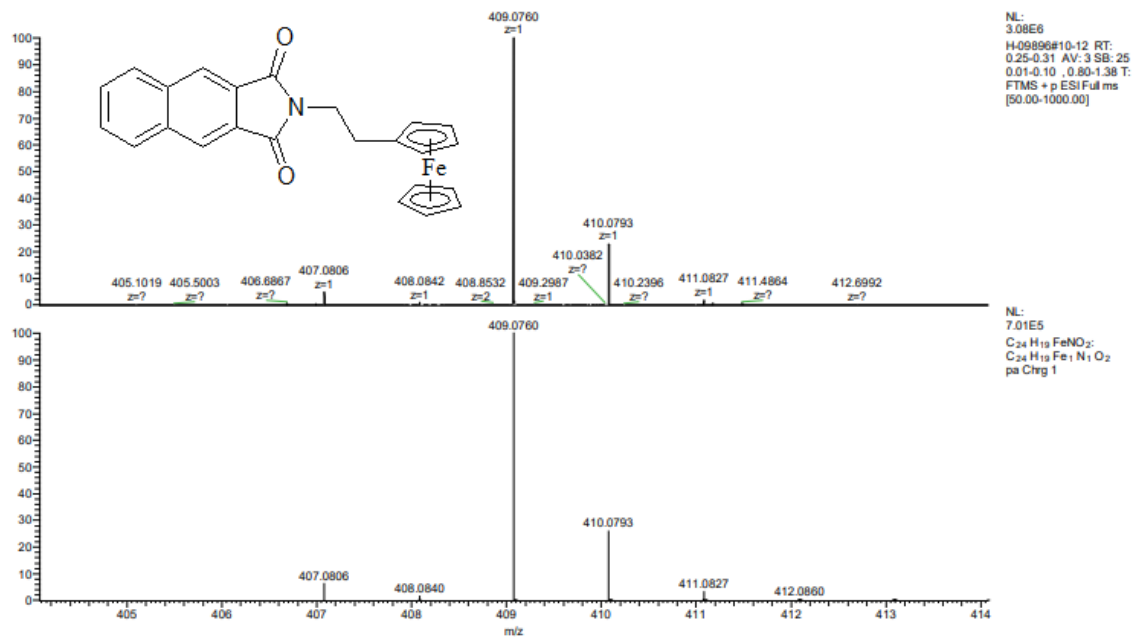
ACN

LCT Premier XE KE483  
1: TOF MS ES+  
1.84e+004



**Figure S9:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{DMSO-d}_6$ ) NMR, HR-MS and IR data for compound **3i**

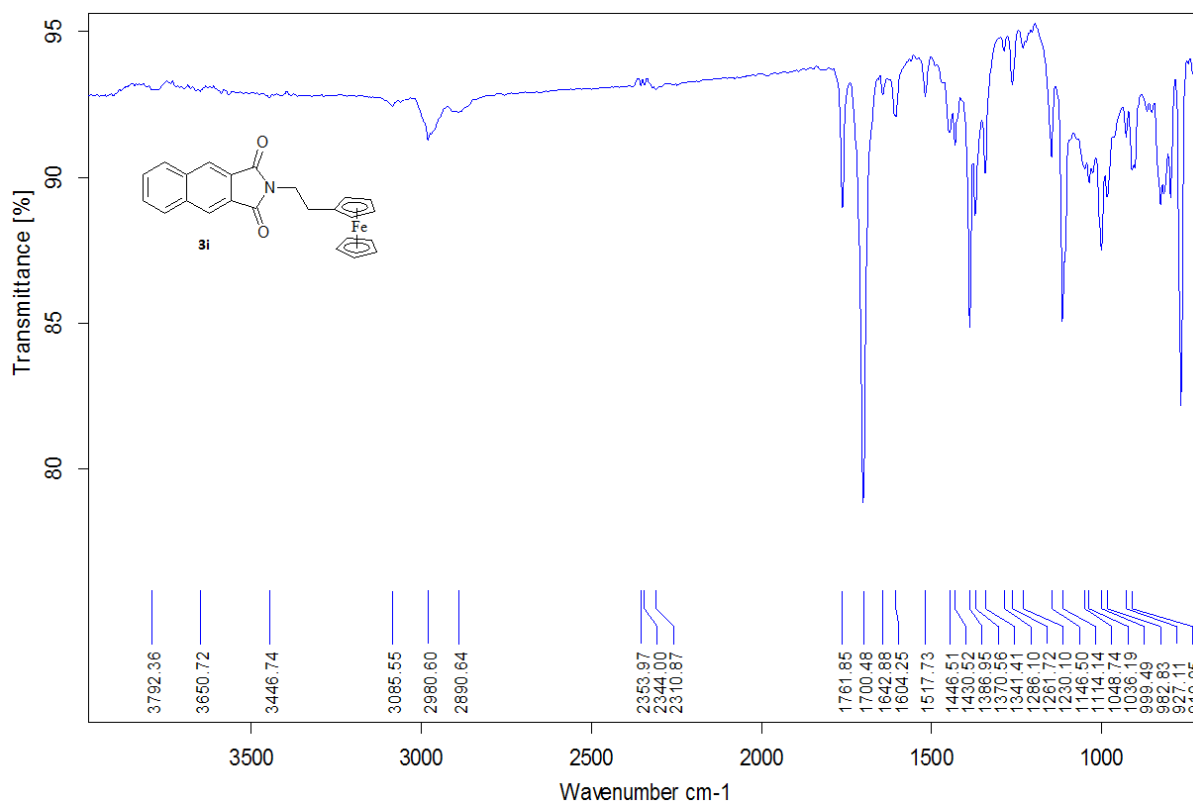




## Experimental/theoretical isotopic pattern MS spectrum

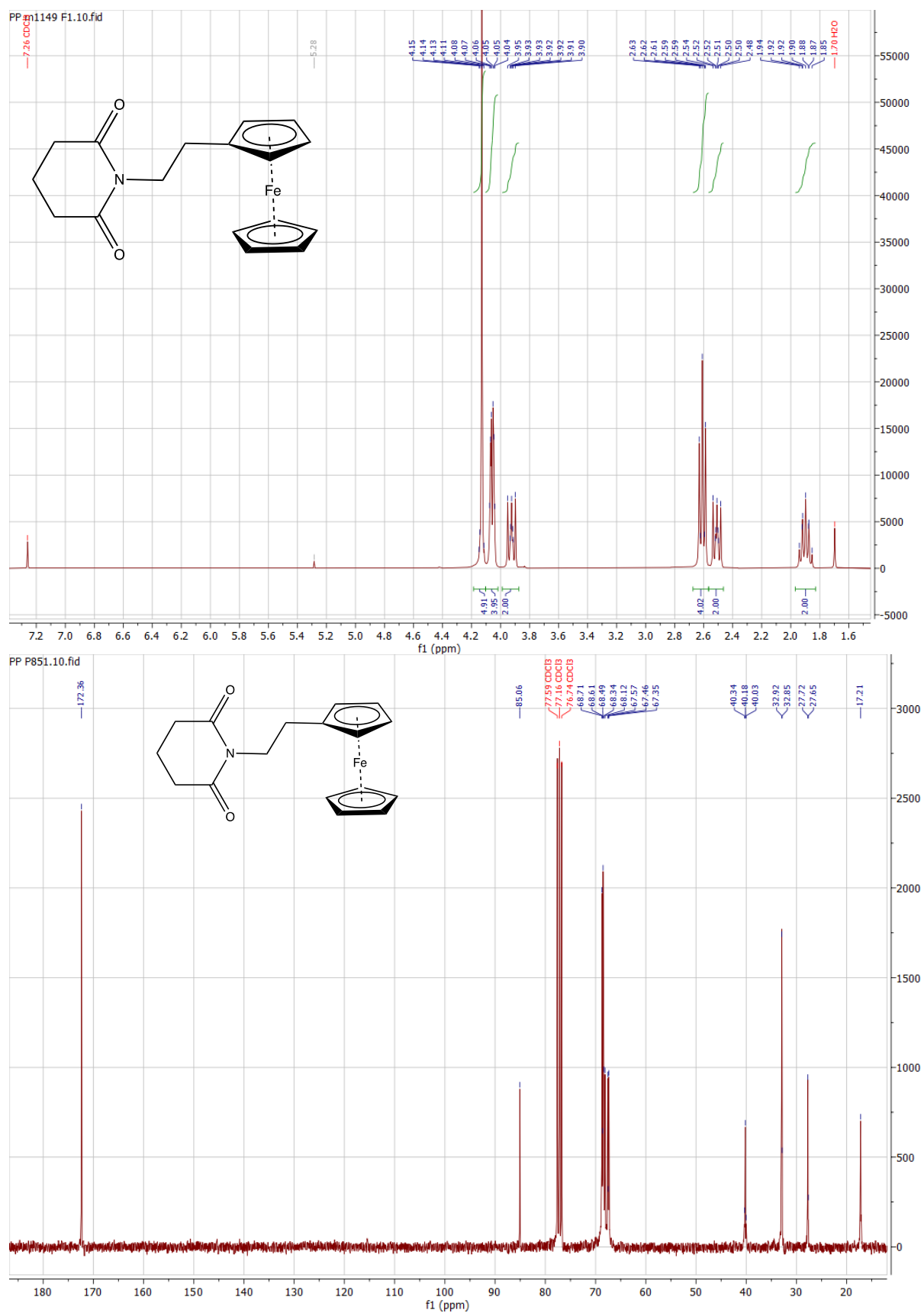
Error = 0.1 ppm; Relative Intensity (%) 100

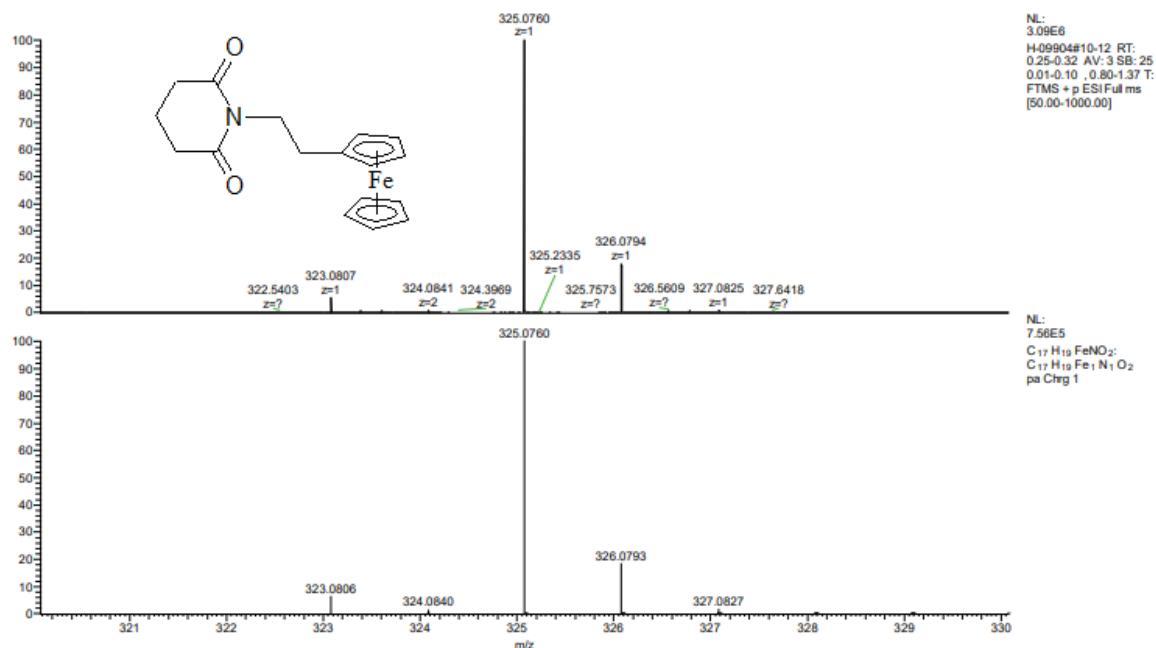
HRMS (ESI) m/z: [M]<sup>+</sup> Calcd for C<sub>24</sub>H<sub>19</sub>FeNO<sub>2</sub> 409.0760 . Found 409.076; (Error: 0.1 ppm).





**Figure S10:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **3j**

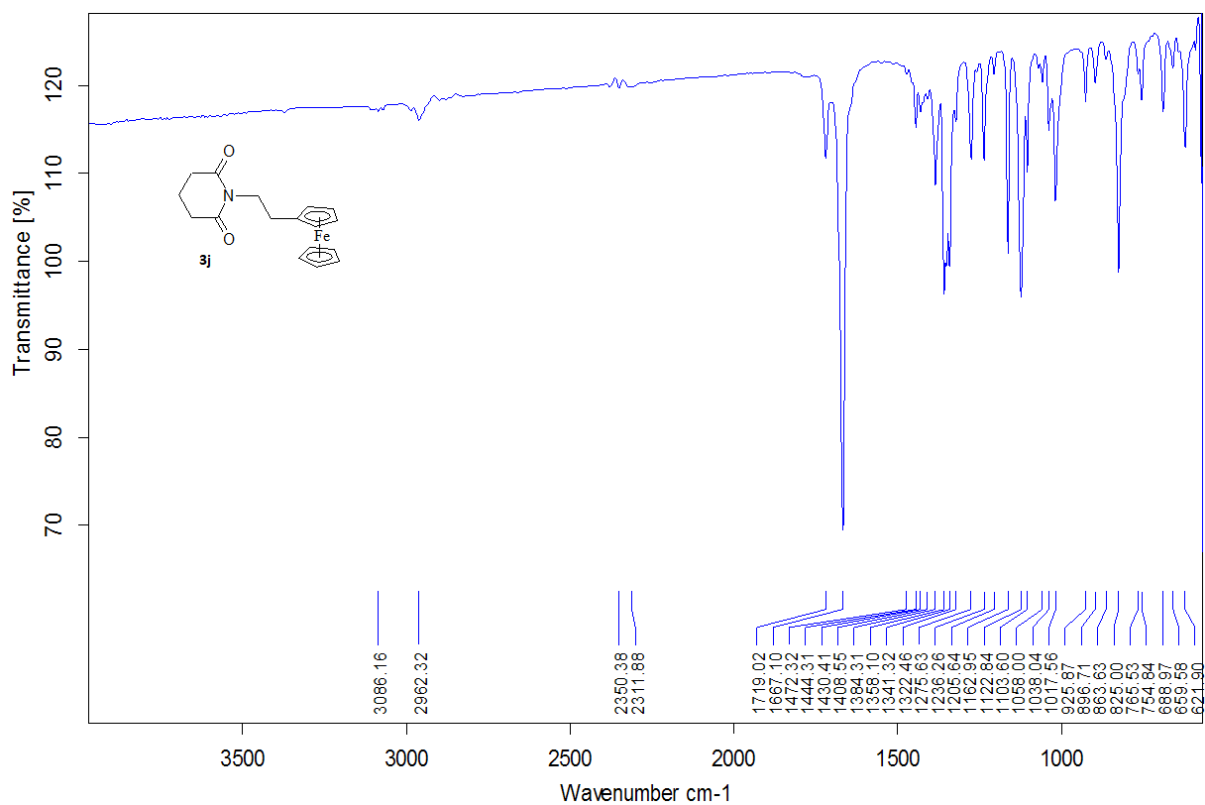




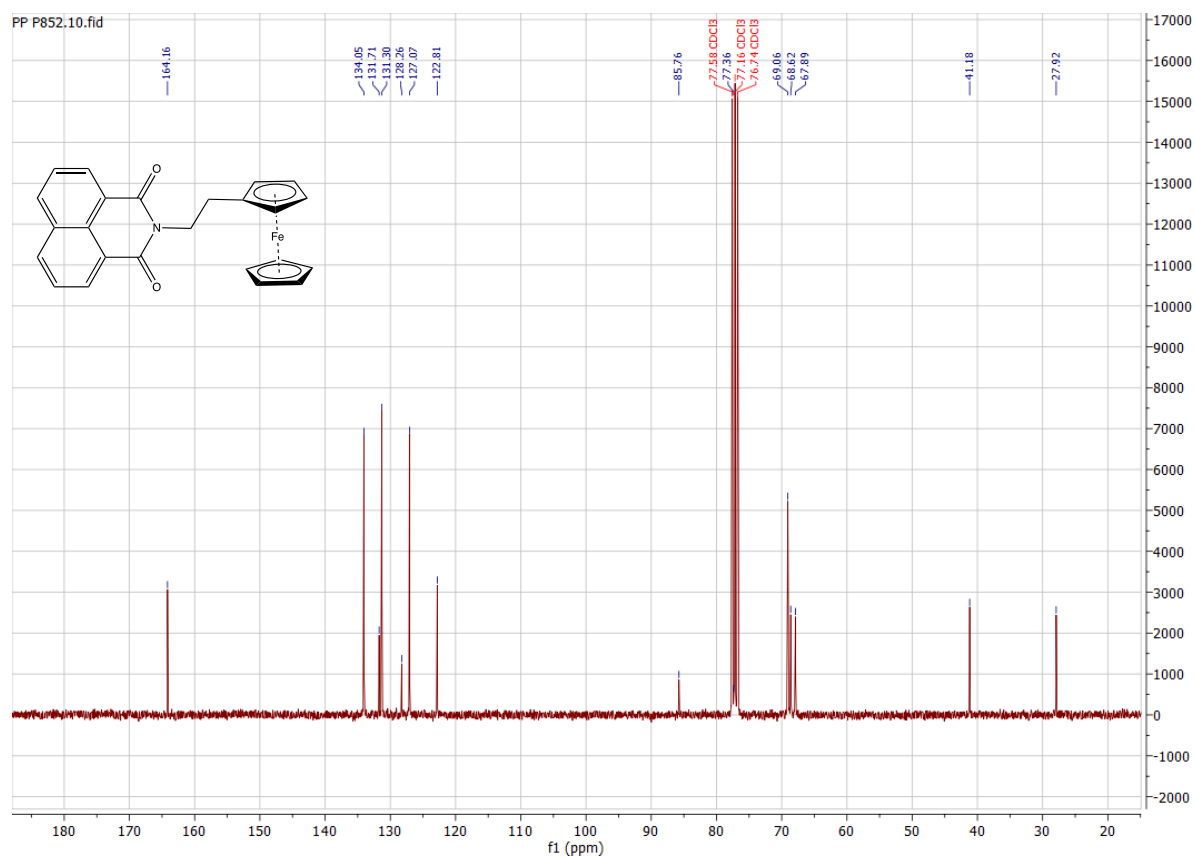
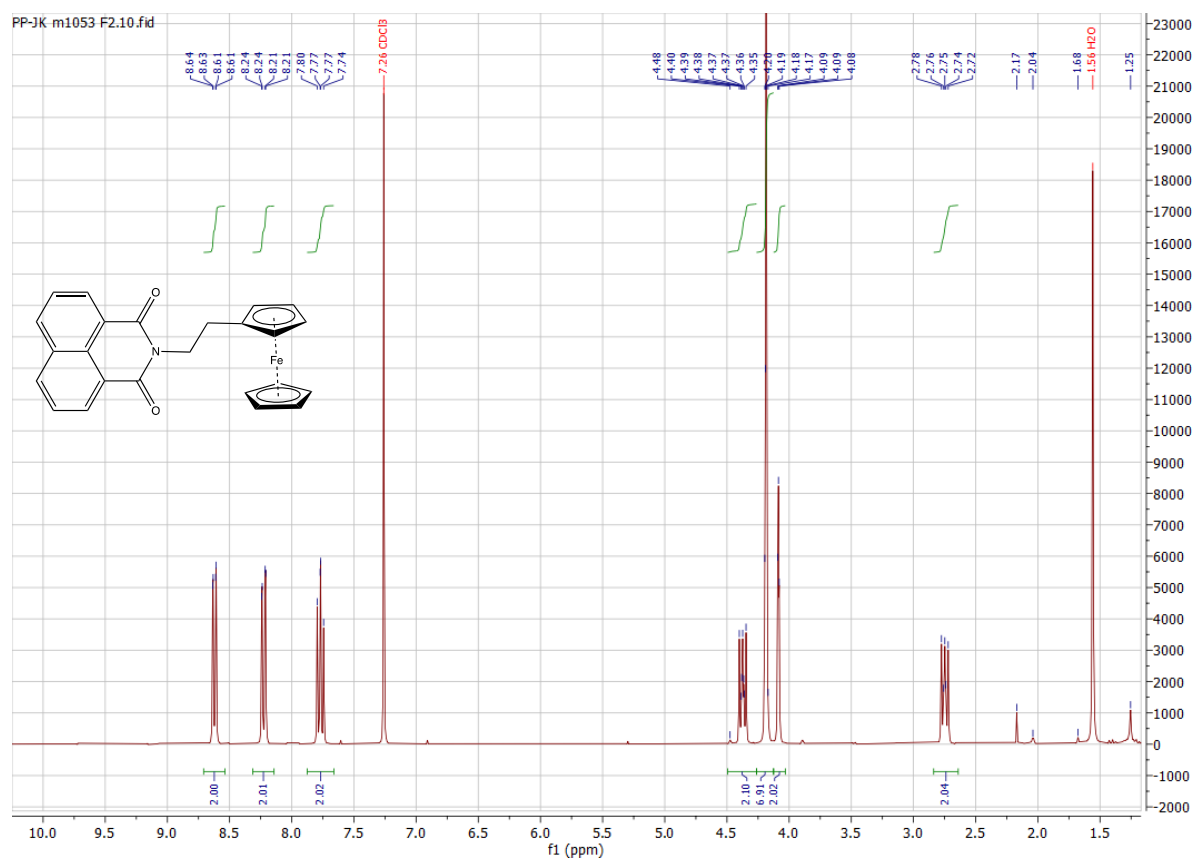
## Experimental/theoretical isotopic pattern MS spectrum

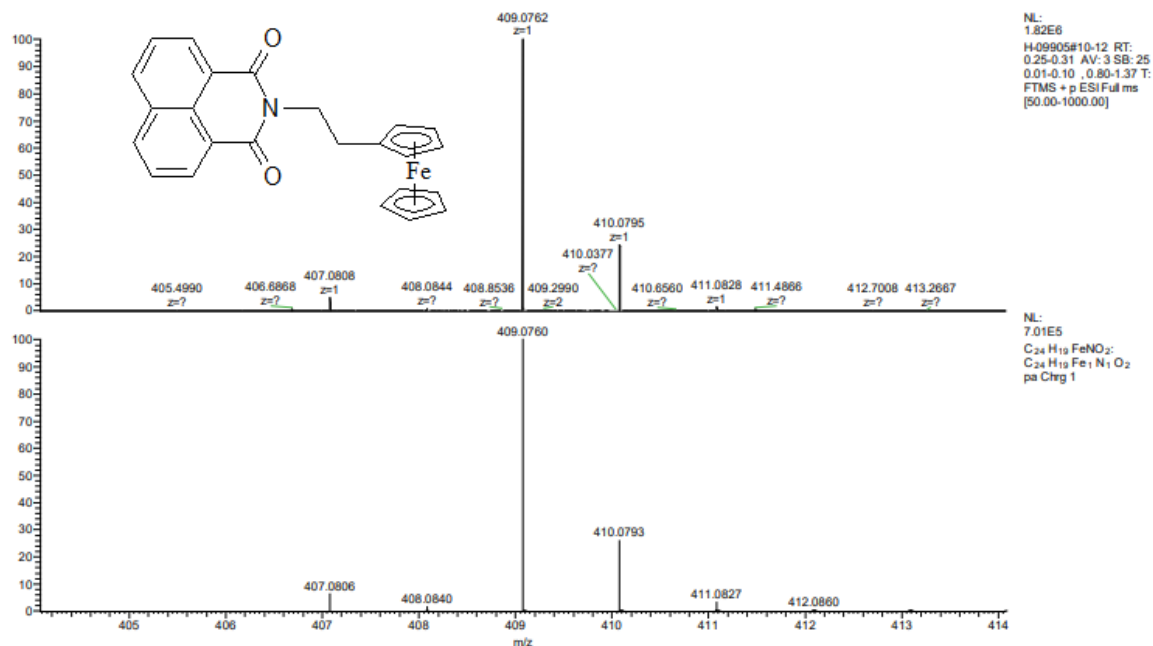
Error = 0.1 ppm; Relative Intensity (%) 100

HRMS (ESI) m/z: [M]<sup>+</sup> Calcd for C<sub>17</sub>H<sub>19</sub>FeNO<sub>2</sub> 325.0760 . Found 325.076; (Error: 0.1 ppm).



**Figure S11:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **3k**

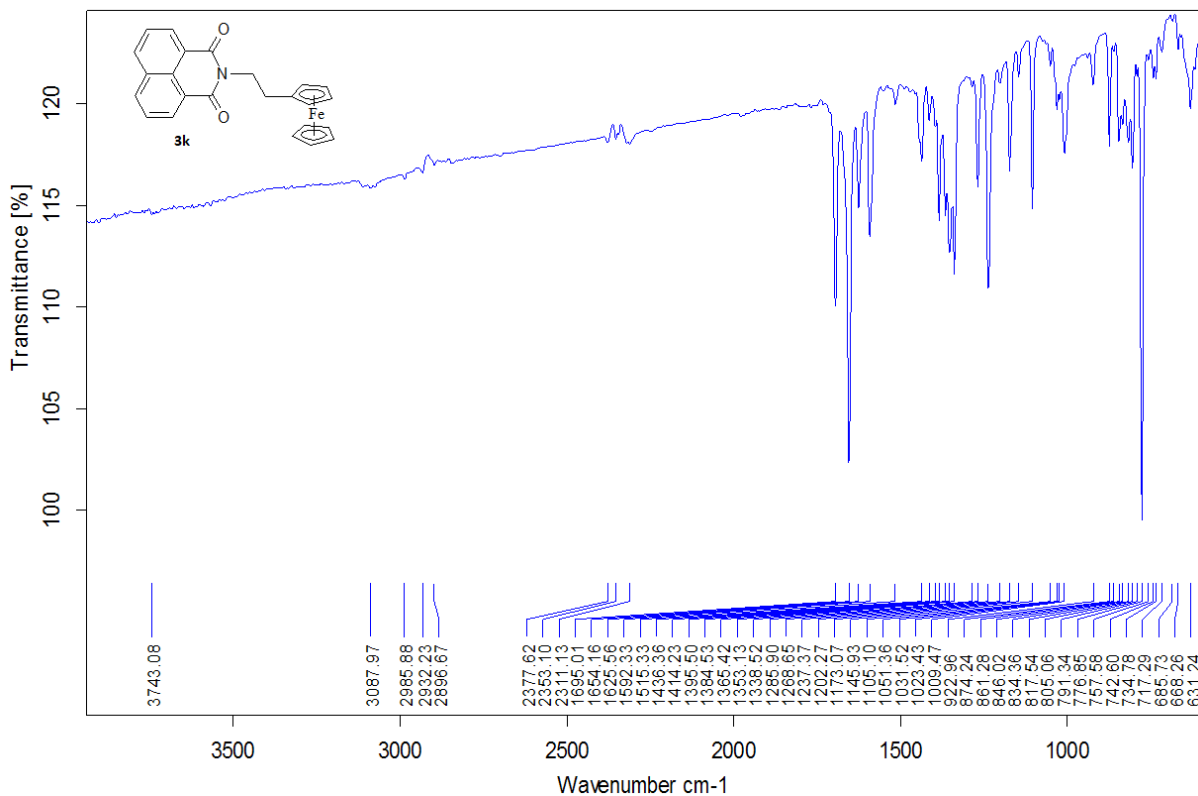




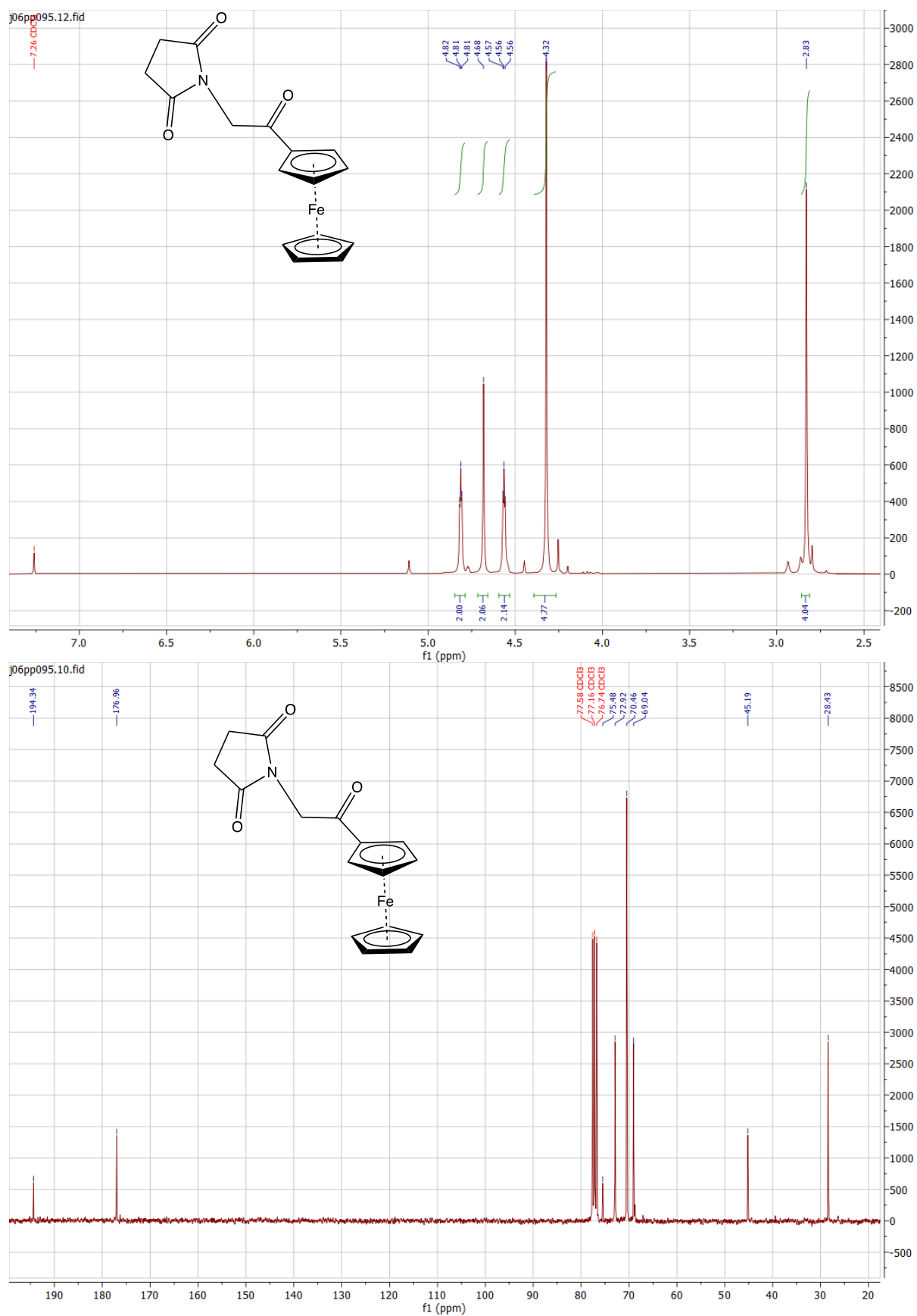
## Experimental/theoretical isotopic pattern MS spectrum

Error = 0.6 ppm; Relative Intensity (%) 100

HRMS (ESI) m/z: [M]<sup>+</sup> Calcd for C<sub>24</sub>H<sub>19</sub>FeNO<sub>2</sub> 409.0760 . Found 409.0762; (Error: 0.6 ppm).



**Figure S12:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **4b**



# Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 100.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 9

Monoisotopic Mass, Even Electron Ions

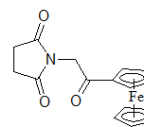
310 formula(e) evaluated with 2 results within limits (all results (up to 1000) for each mass)

Elements Used:

C: 0-100 H: 1-120 N: 0-10 O: 0-10 Fe: 1-1

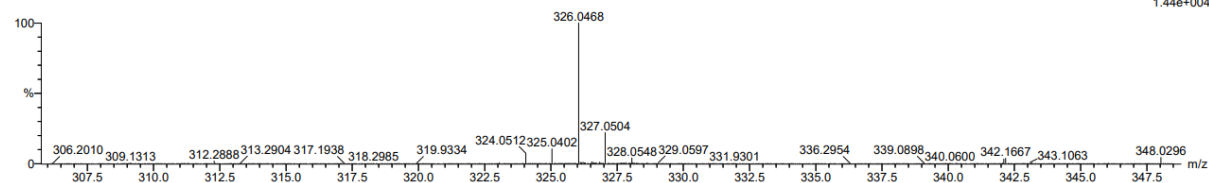
06-Sep-2013 5:11:7

ENSCP\_P737 26 (0.681) Cm (26.32)



MeOH

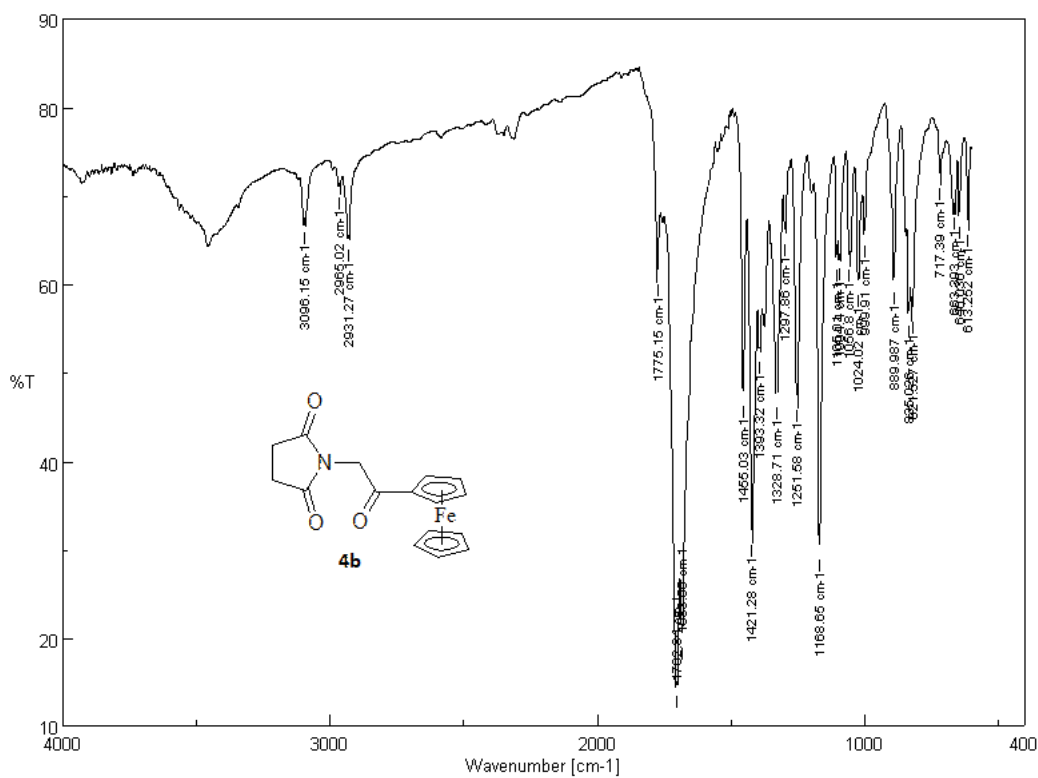
LCT Premier XE KE483  
1: TOF MS ES+  
1.44e+004



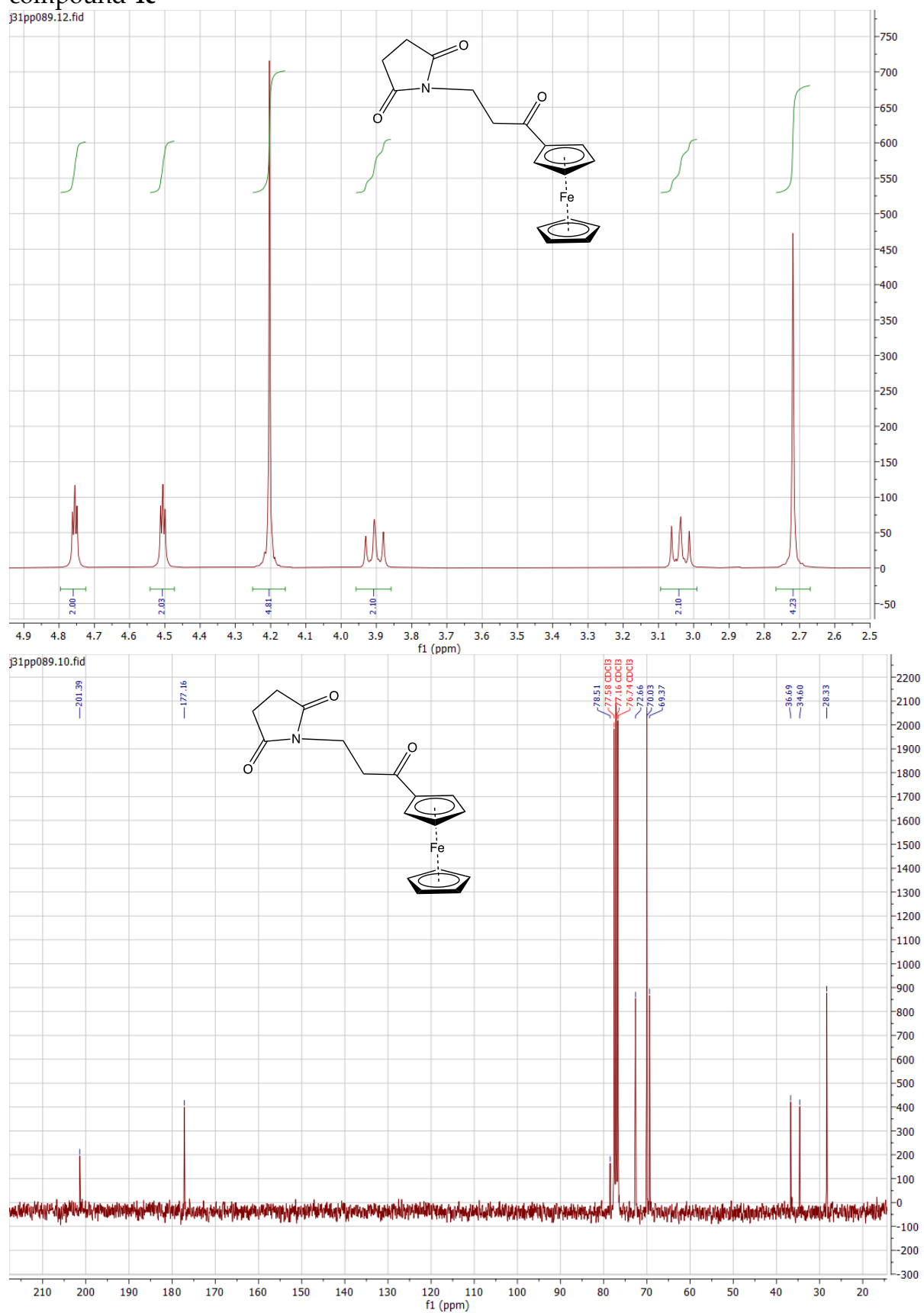
Minimum:

Maximum:

Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	i-FIT (Norm)	Formula
326.0468	326.0480	-1.2	-3.7	9.5	763.4	0.0	C16 H16 N O3 Fe
	326.0453	1.5	4.6	10.5	770.9	7.5	C12 H12 N7 O Fe



**Figure S13:**  $^1\text{H}$  (in in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **4c**



# Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 100.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 9

Monoisotopic Mass, Even Electron Ions

332 formula(e) evaluated with 2 results within limits (all results (up to 1000) for each mass)

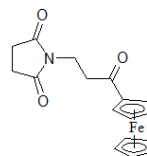
Elements Used:

C: 0-100 H: 1-120 N: 0-10 O: 0-10 Fe: 1-1

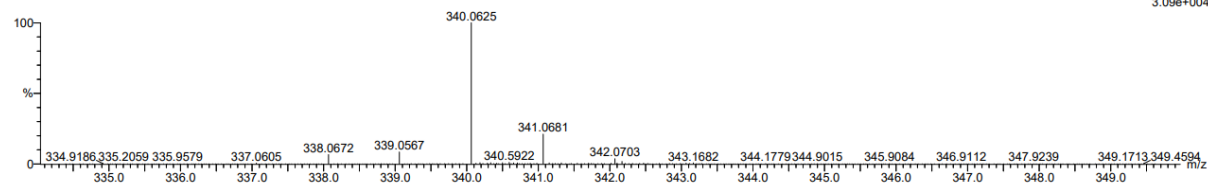
06-Sep-2013 5:8:9

ENSCP\_P724 24 (0.625) Cm (24.31)

MeOH



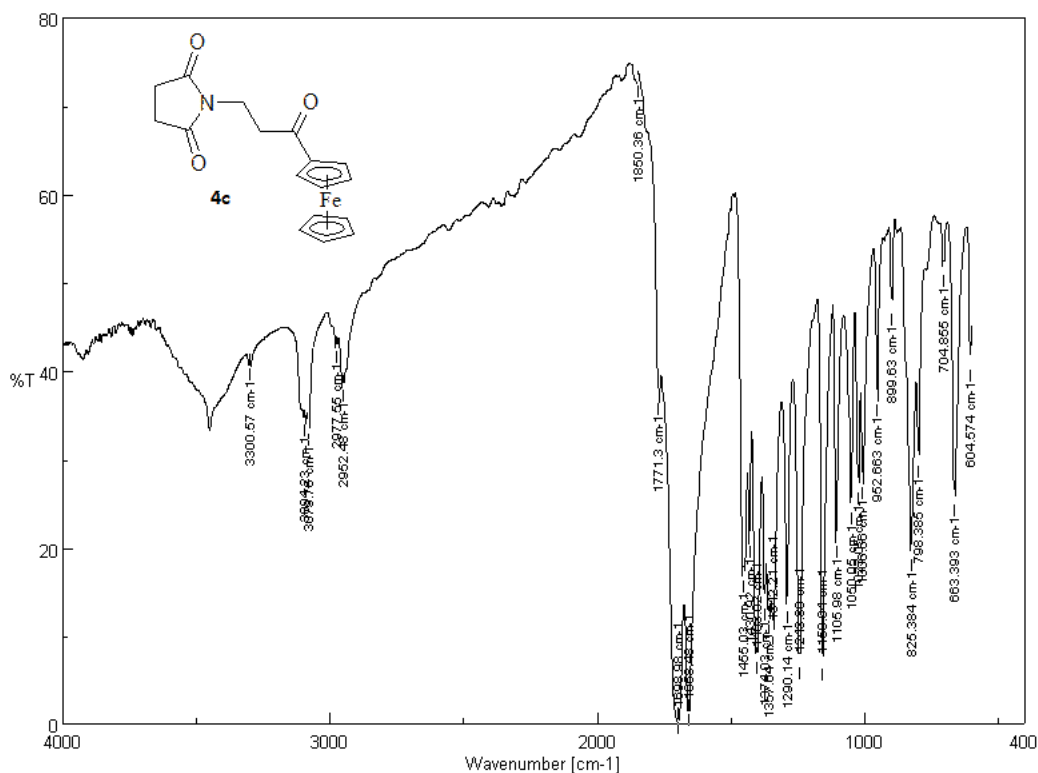
LCT Premier XE KE483  
1: TOF MS ES+  
3.09e+004



Minimum:

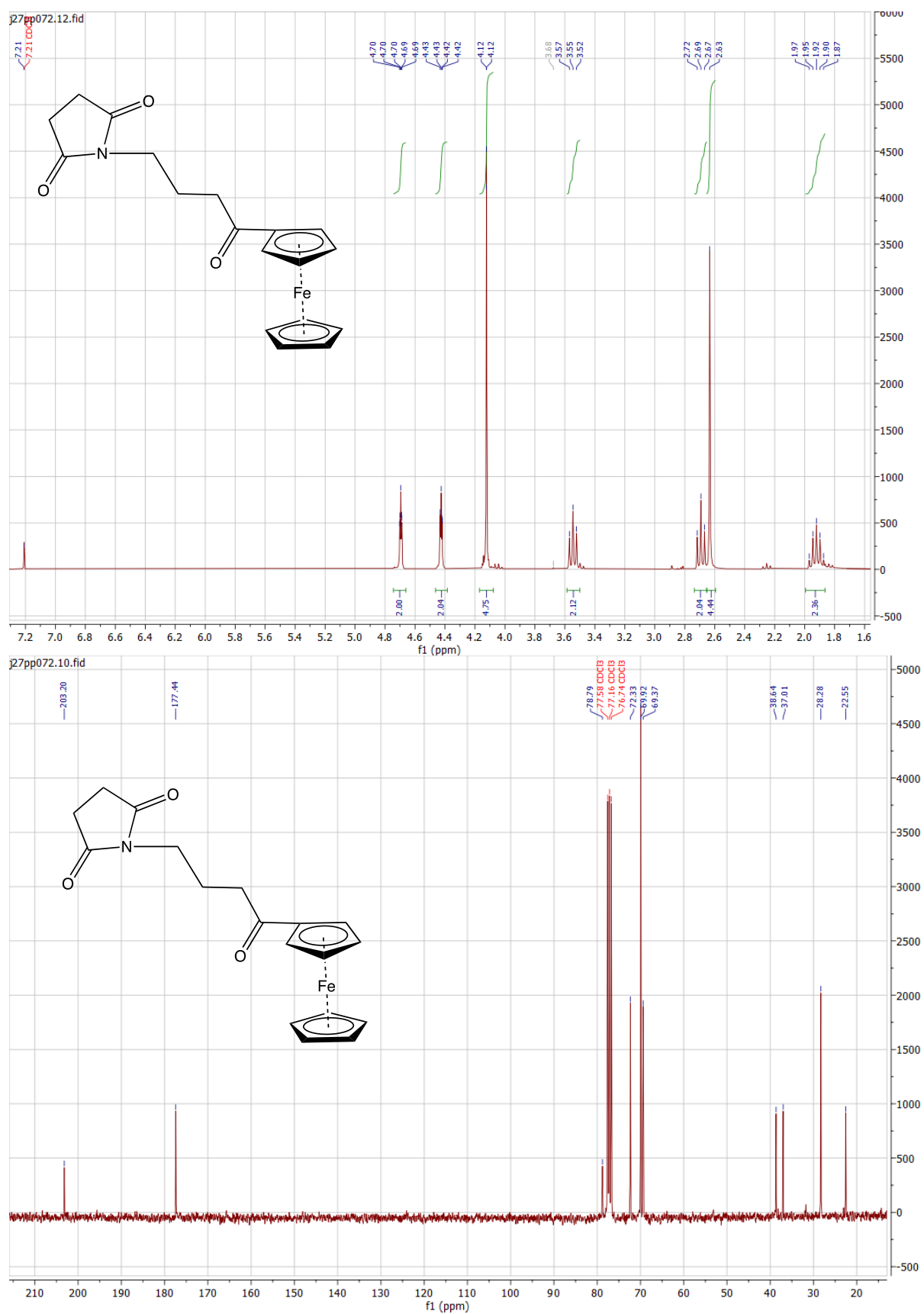
Maximum:

		5.0	5.0	-1.5				
				100.0				
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	i-FIT (Norm)	Formula	
340.0625	340.0636	-1.1	-3.2	9.5	975.5	0.0	C17 H18 N O3 Fe	
	340.0609	1.6	4.7	10.5	982.2	6.7	C13 H14 N7 O Fe	





**Figure S14:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **4d**



# Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 100.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 9

Monoisotopic Mass, Even Electron Ions

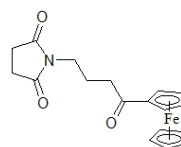
356 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)

Elements Used:

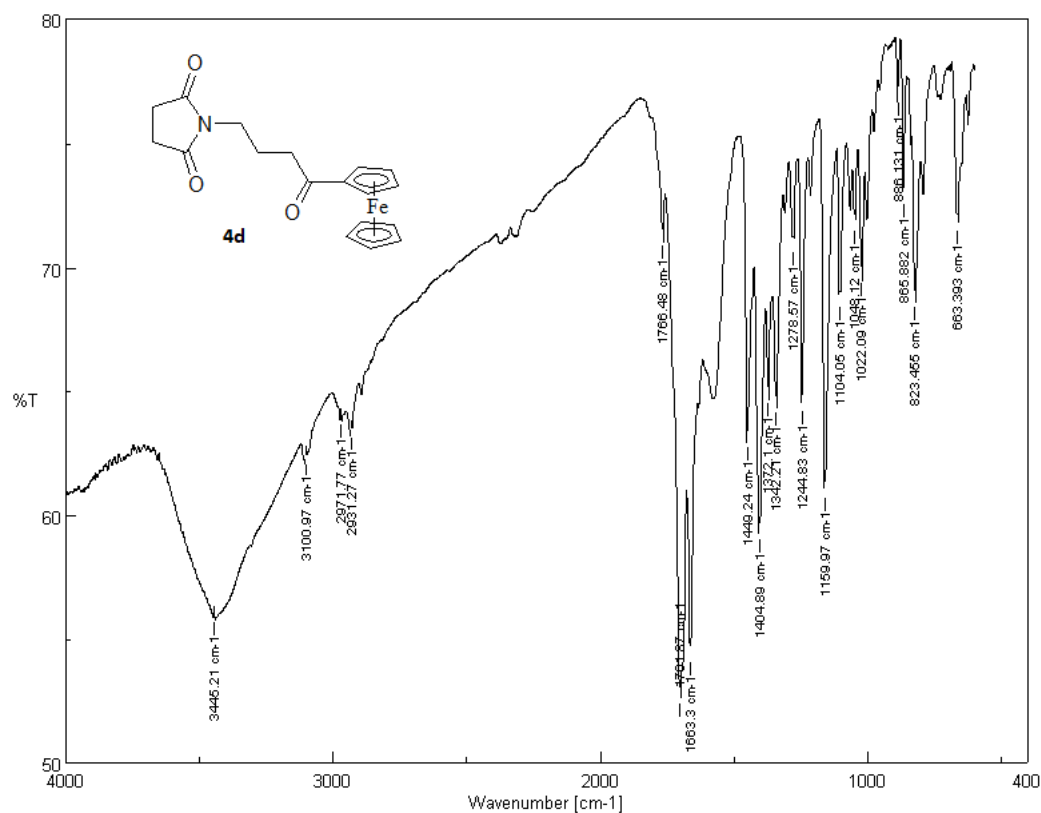
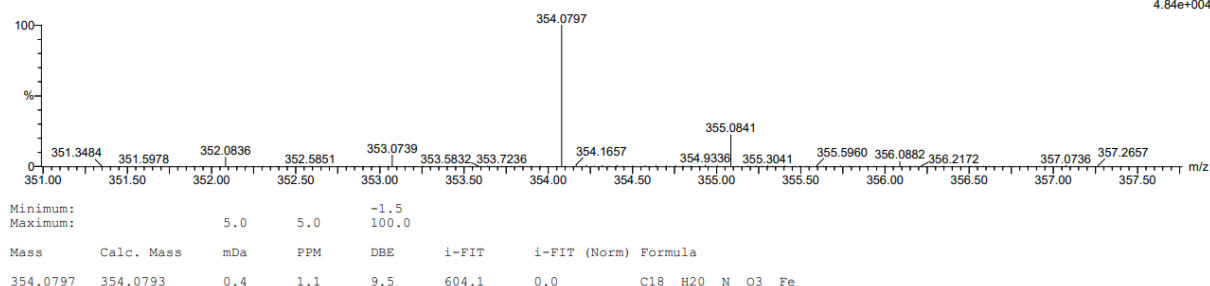
C: 0-100 H: 1-120 N: 0-10 O: 0-10 Fe: 1-1

06-Sep-2013 5:33:2

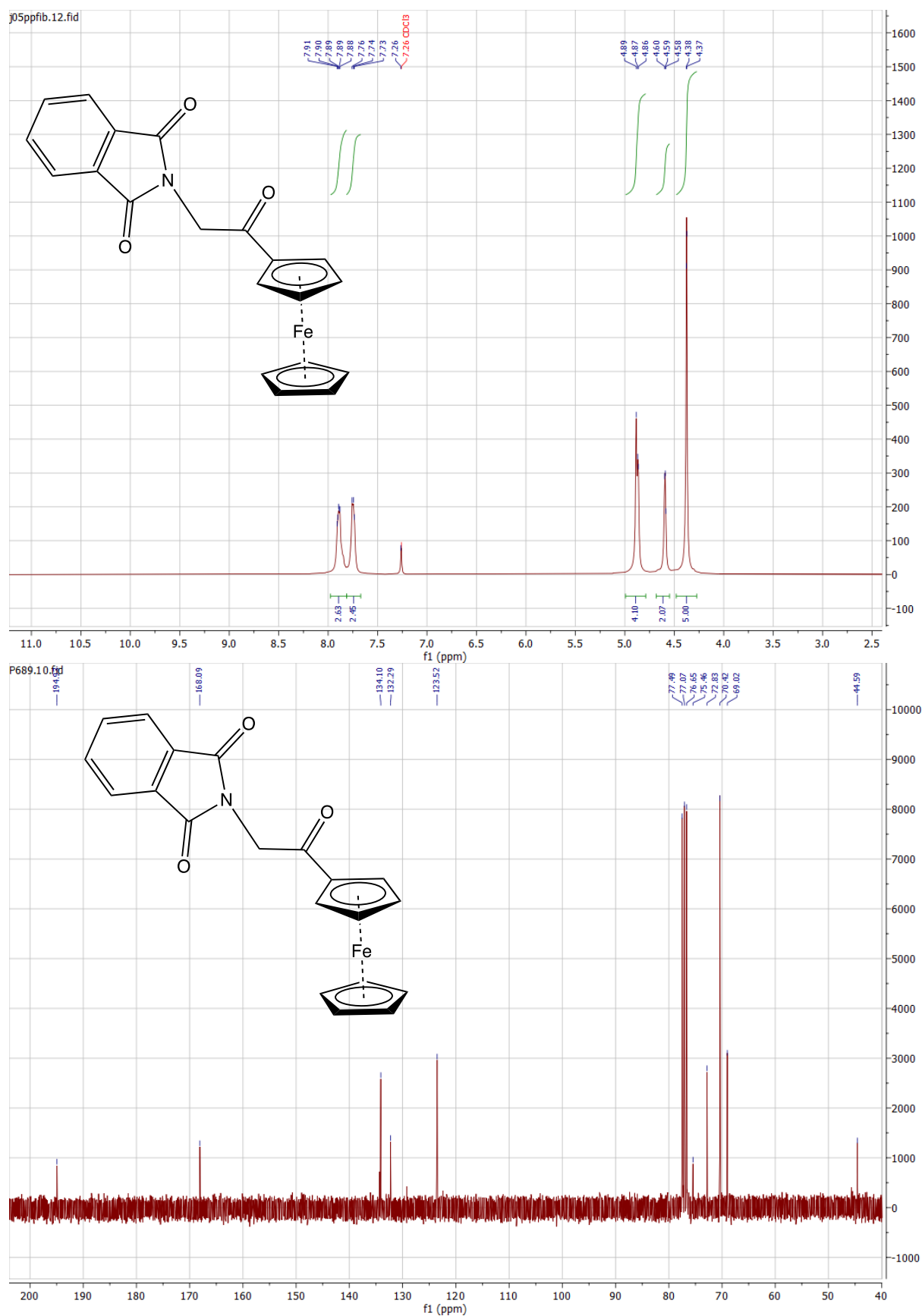
ENSCP\_P726 21 (0.573) Cm (20:28)



LCT Premier XE KE483  
1: TOF MS ES+  
4.84e+004

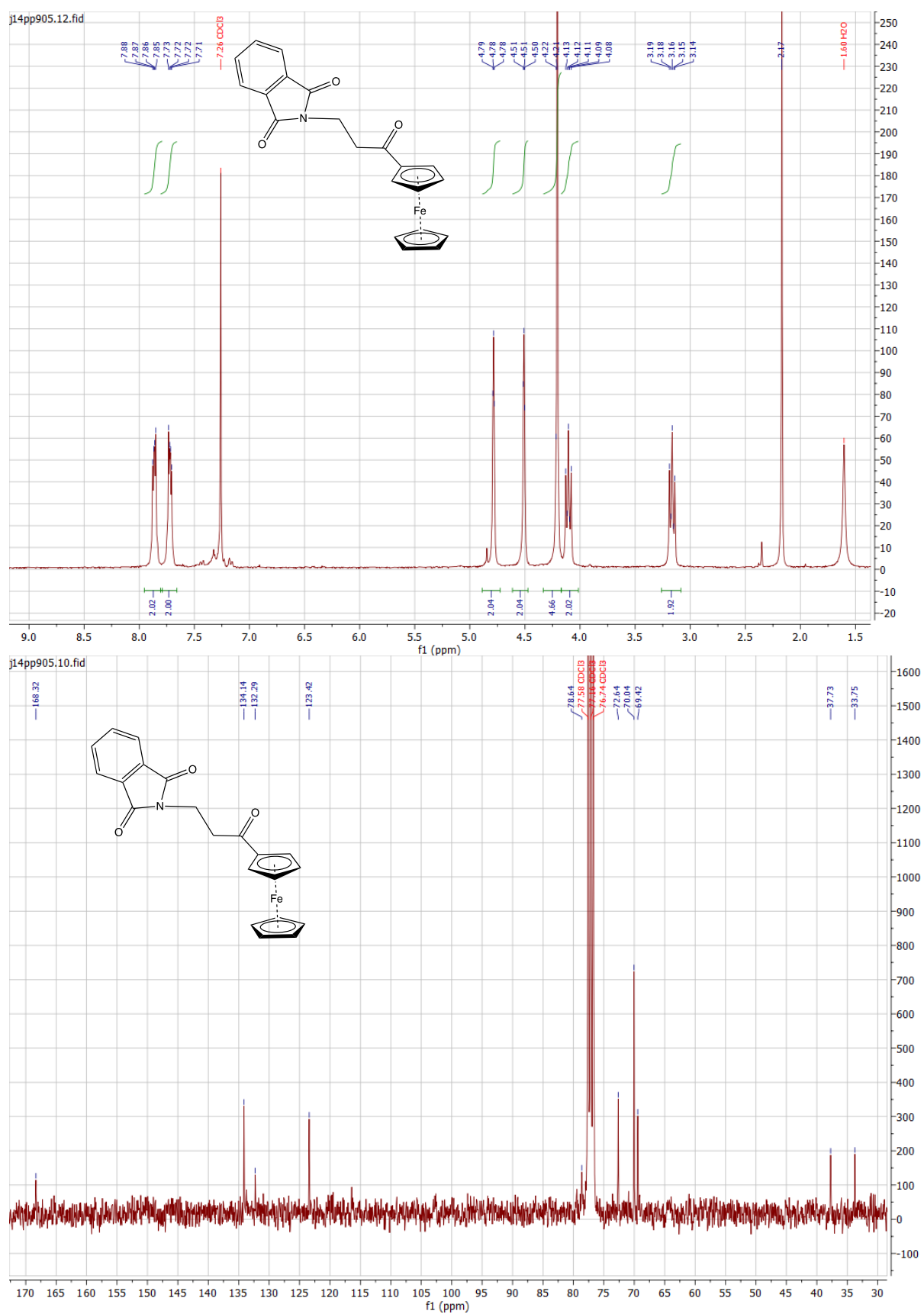


**Figure S15:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **4f**





**Figure S16:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **4g**



# Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 100.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 9

Monoisotopic Mass, Even Electron Ions

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

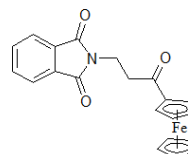
Elements Used:

C: 0-100 H: 1-120 N: 0-10 O: 0-10 Fe: 1-1

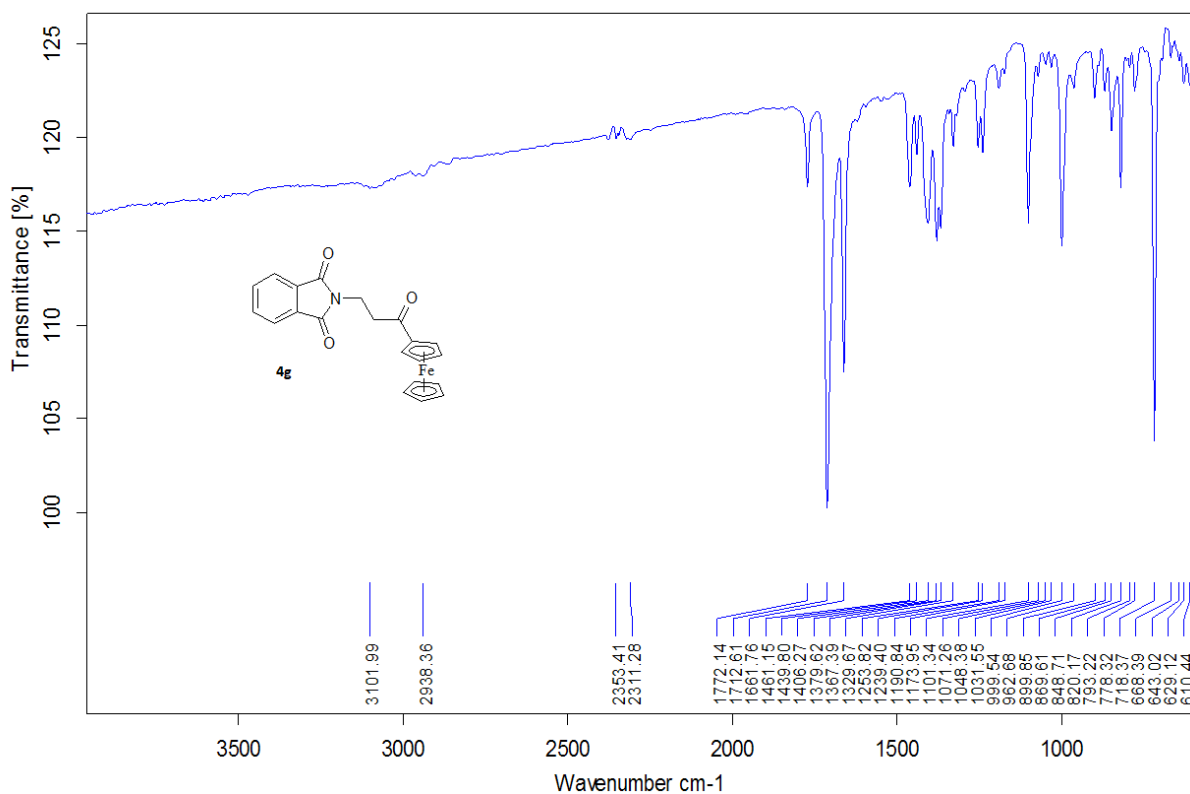
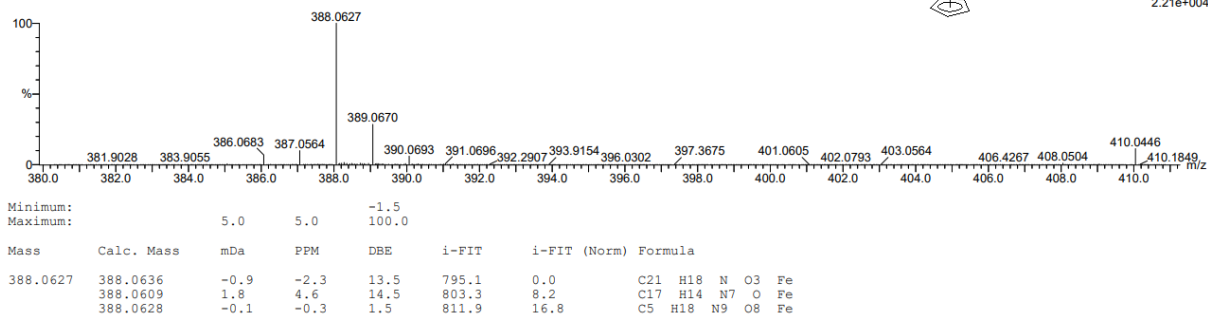
06-Sep-2013 5:21:1

ENSCP\_P662 26 (0.680) Cm (26.32)

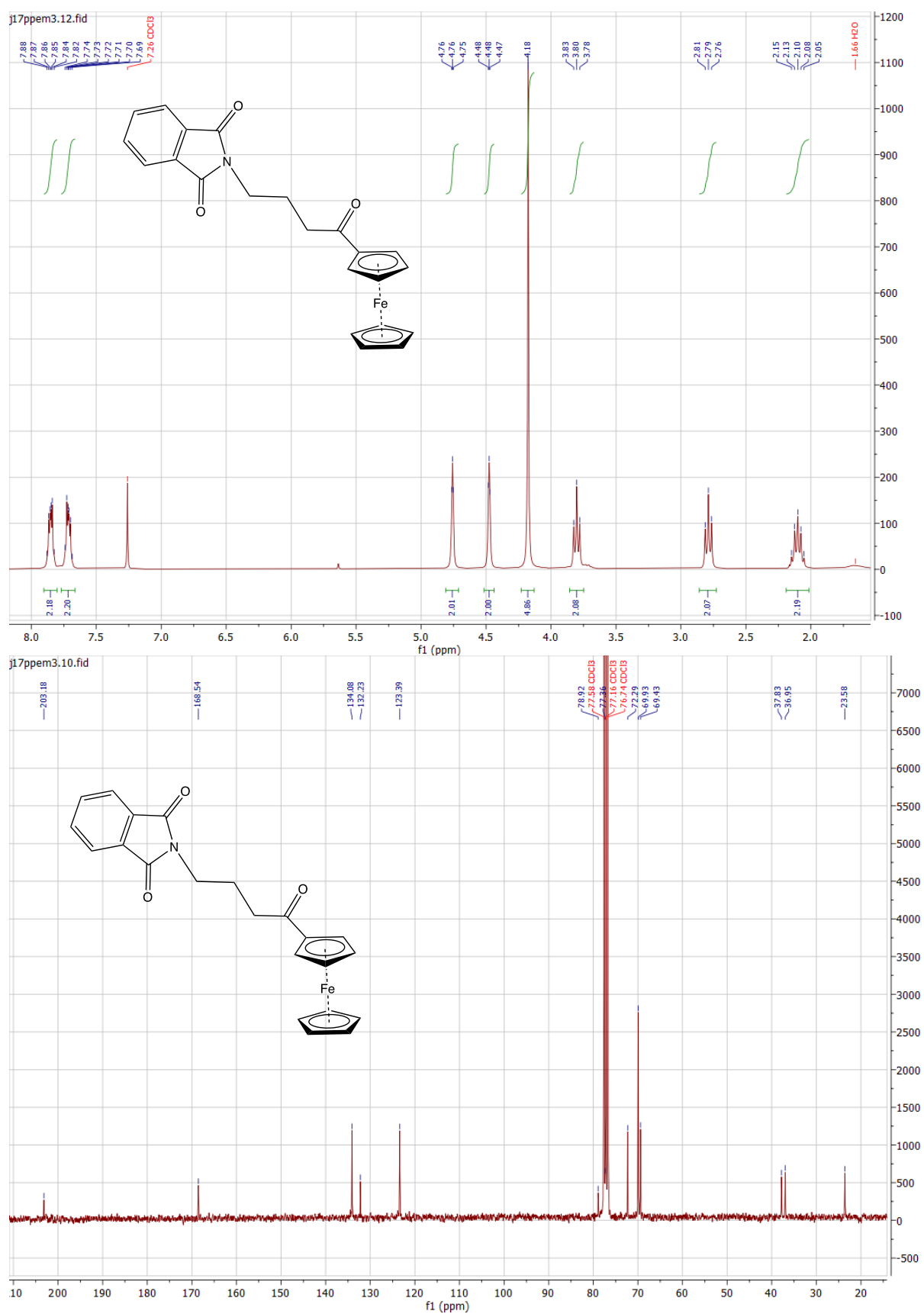
MeOH



LCT Premier XE KE483  
1: TOF MS ES+  
2.21e+004



**Figure S17:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **4h**



# Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 100.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 9

Monoisotopic Mass, Even Electron Ions

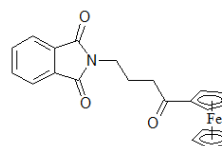
423 formula(e) evaluated with 2 results within limits (all results (up to 1000) for each mass)

Elements Used:

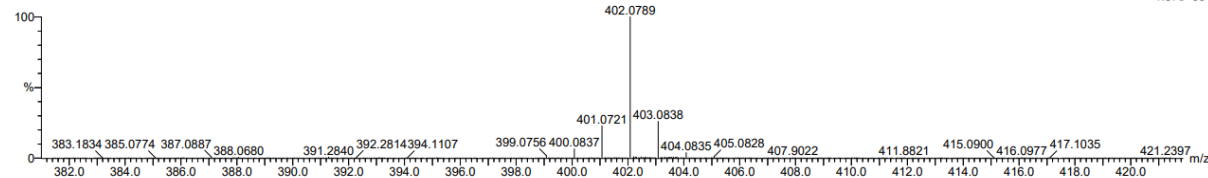
C: 0-100 H: 1-120 N: 0-10 O: 0-10 Fe: 1-1

06-Sep-2013 5:5:9

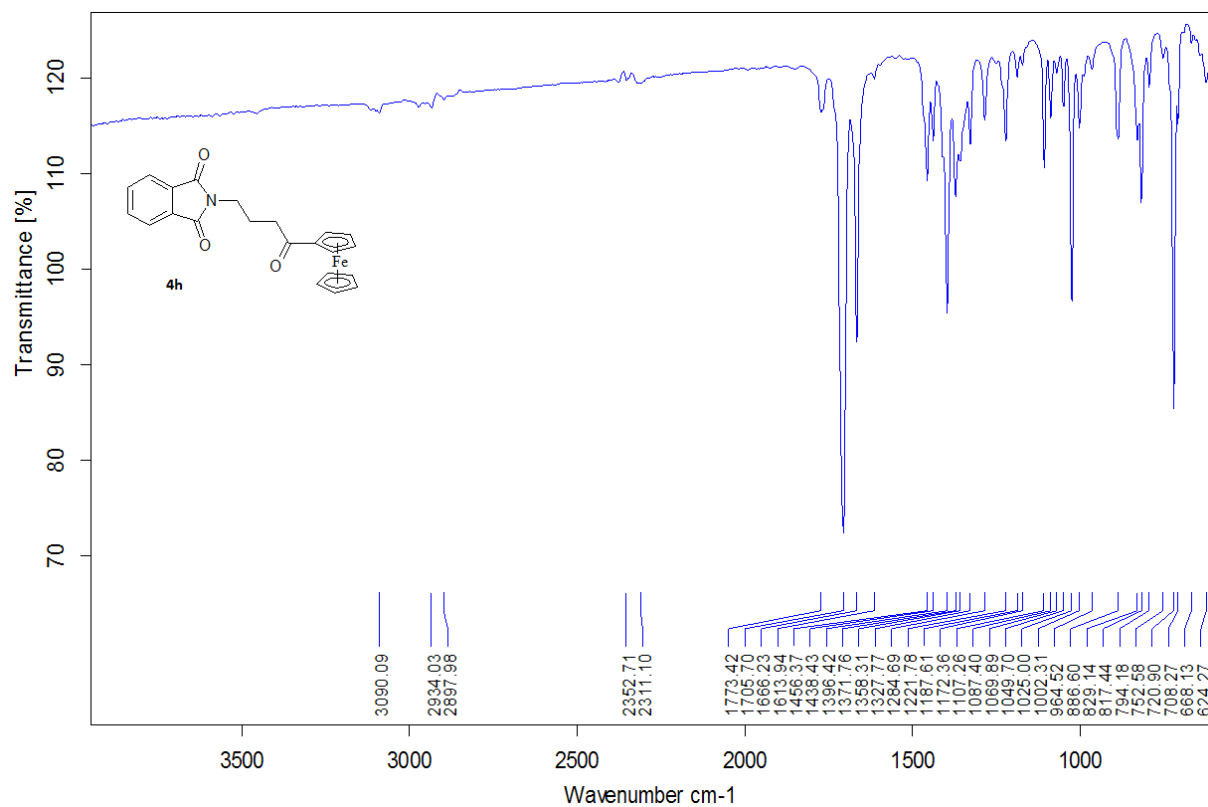
ENSCP\_P671 28 (0.715) Cm (28.38)



LCT Premier XE KE483  
1: TOF MS ES+  
1.37e+004

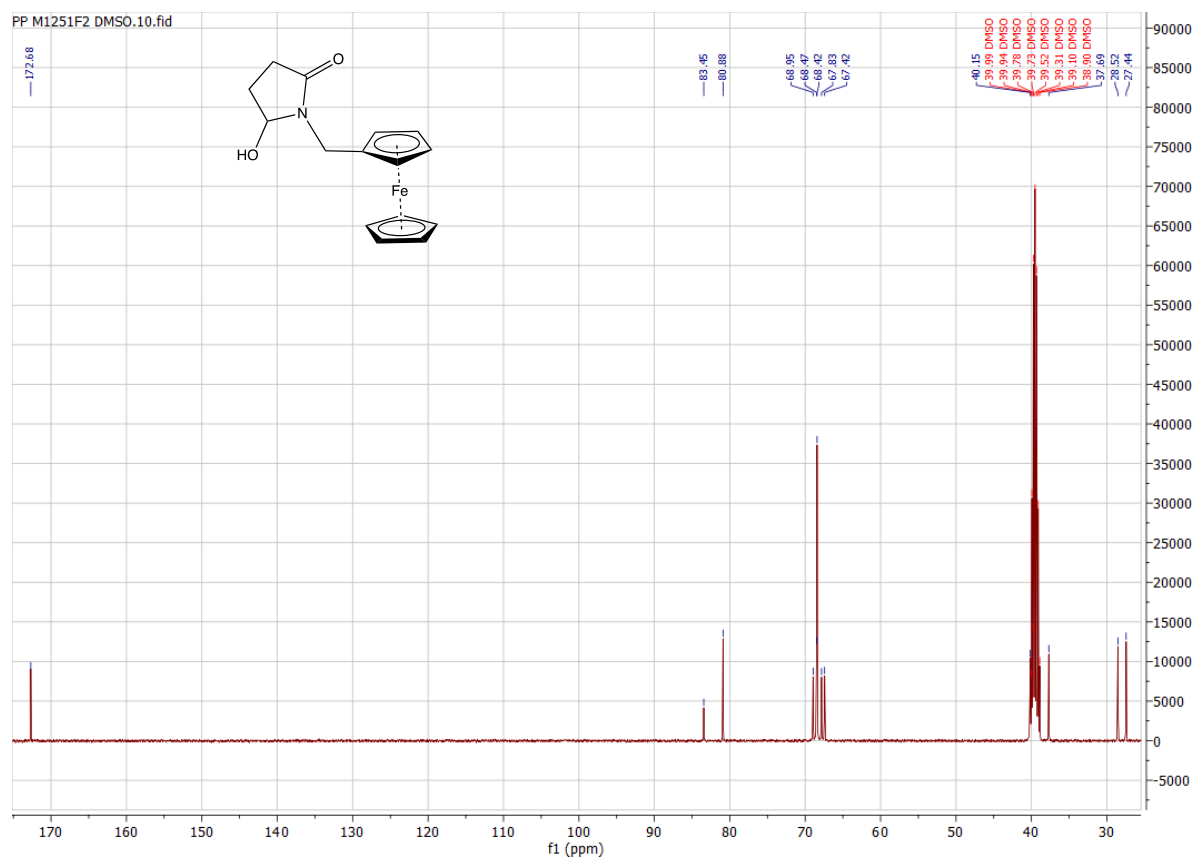
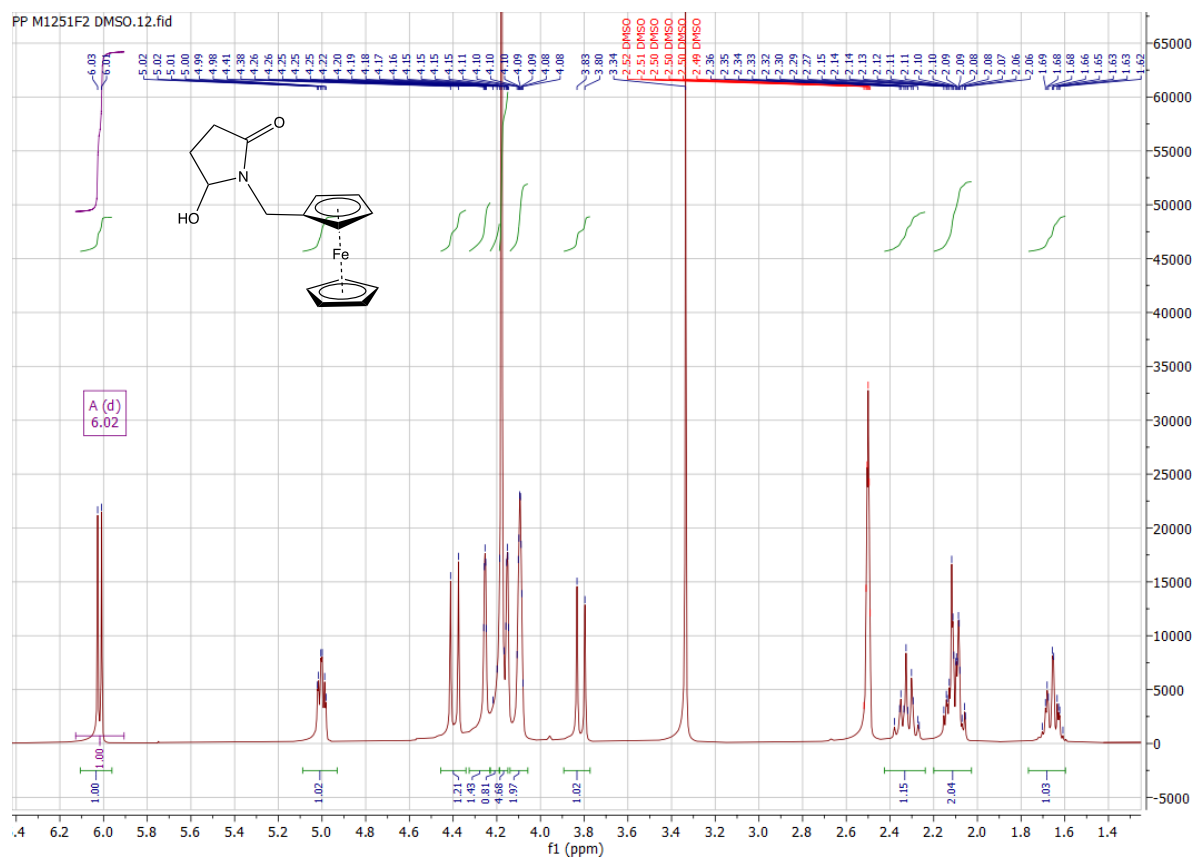


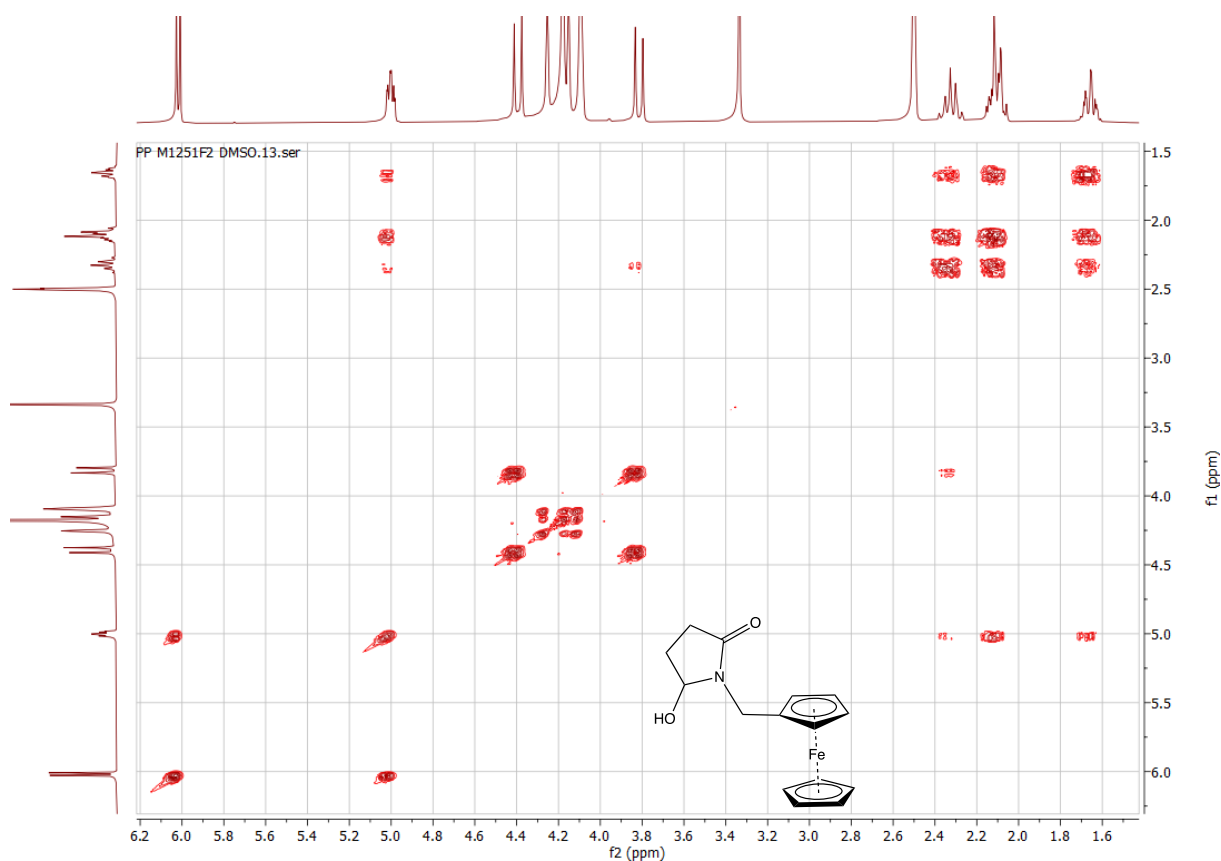
Minimum:				-1.5					
Maximum:		5.0	5.0	100.0					
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	i-FIT (Norm)	Formula		
402.0789	402.0793	-0.4	-1.0	13.5	810.4	0.0	C22	H20	N O3 Fe
	402.0784	0.5	1.2	1.5	824.7	14.3	C6	H20	N9 O8 Fe





**Figure S18:**  $^1\text{H}$  (in  $\text{DMSO-d}_6$ ),  $^{13}\text{C}$  (in  $\text{DMSO-d}_6$ ), COSY (in  $\text{DMSO-d}_6$ ) NMR, NMR, HR-MS and IR data for compound **6a**

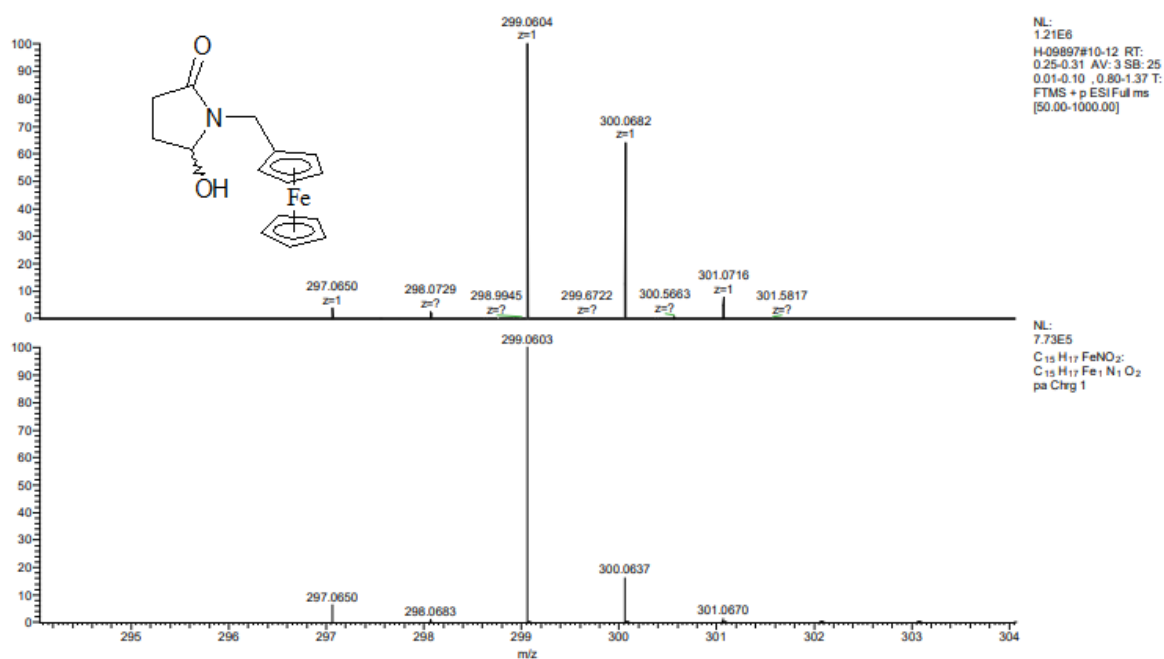




C:\Xcalibur\data\Analyses\H-09897  
MeCN

3/7/2022 3:47:47 PM

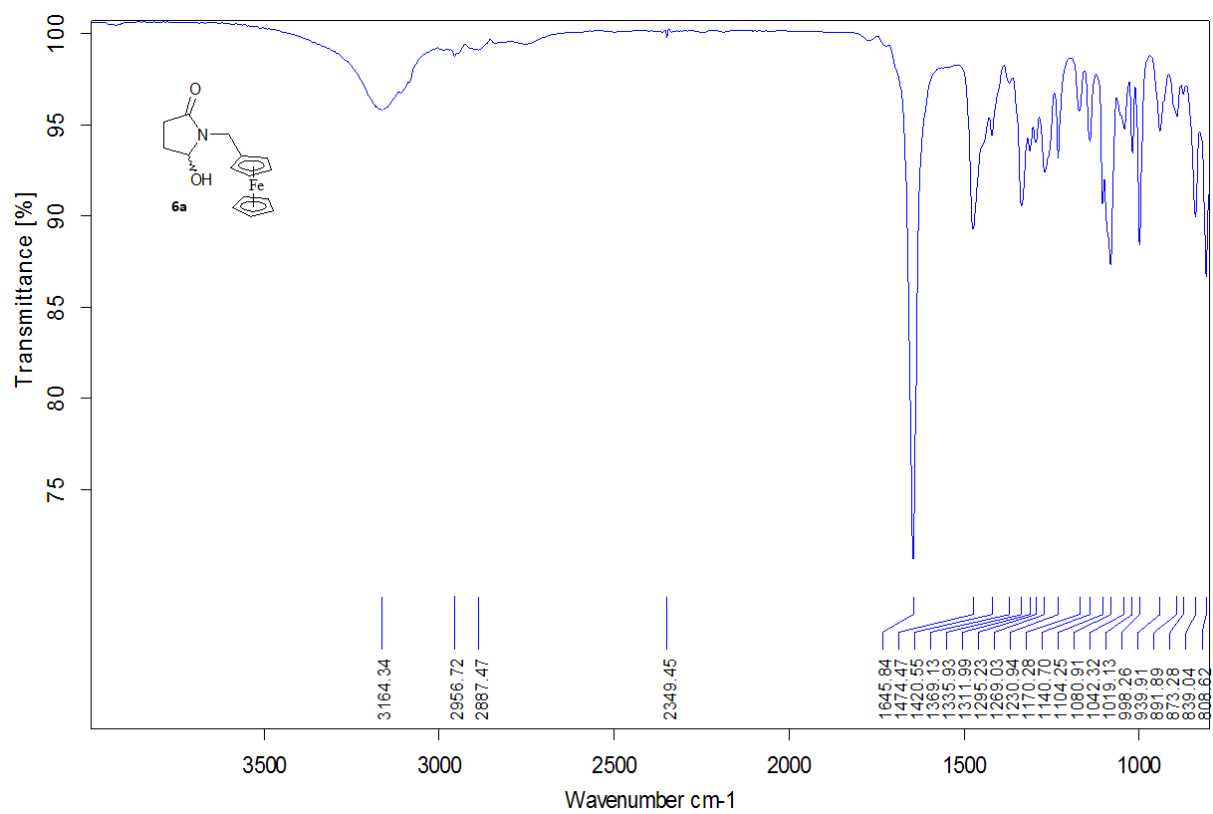
Pascal Pigeon P954



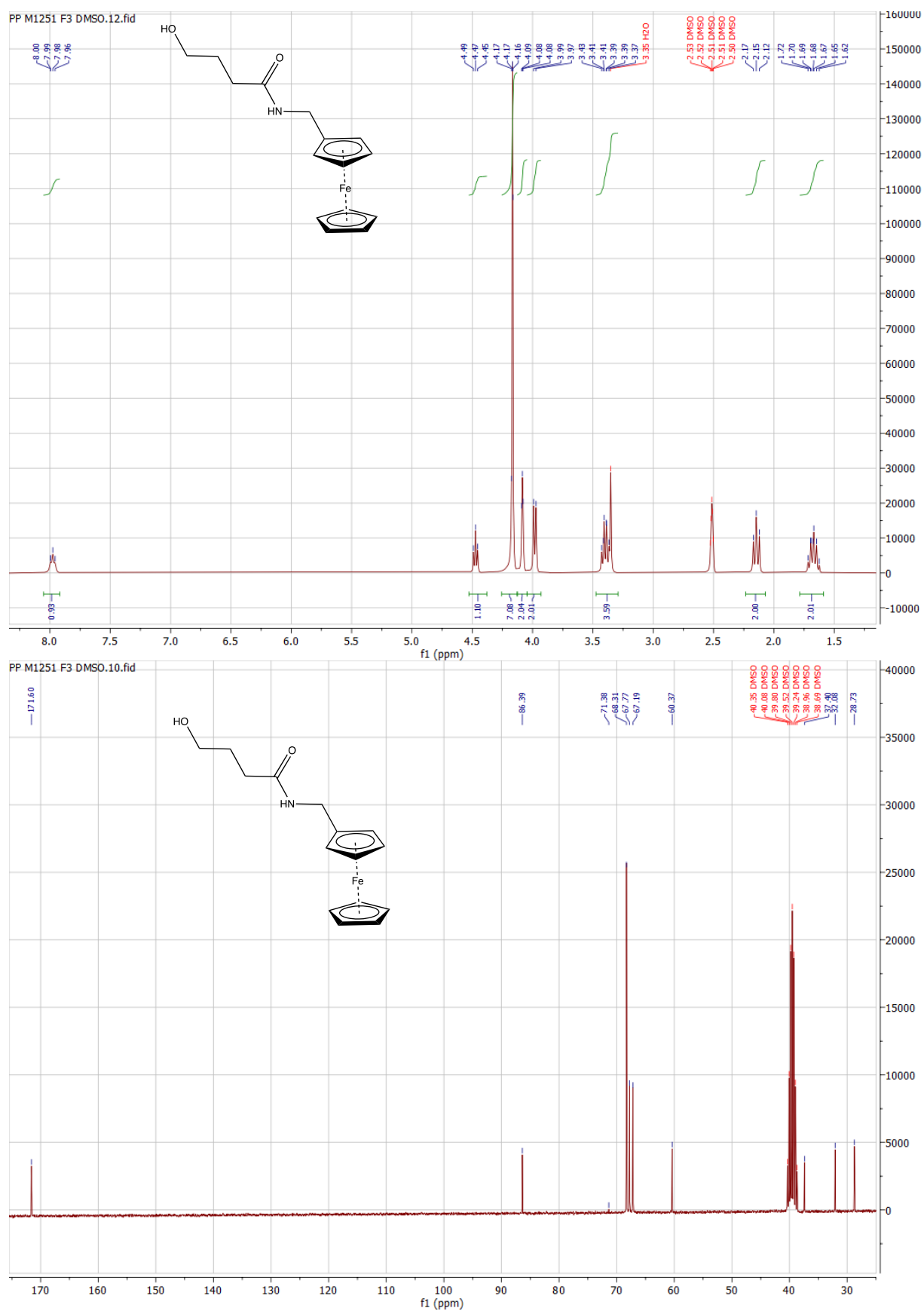
## Experimental/theoretical isotopic pattern MS spectrum

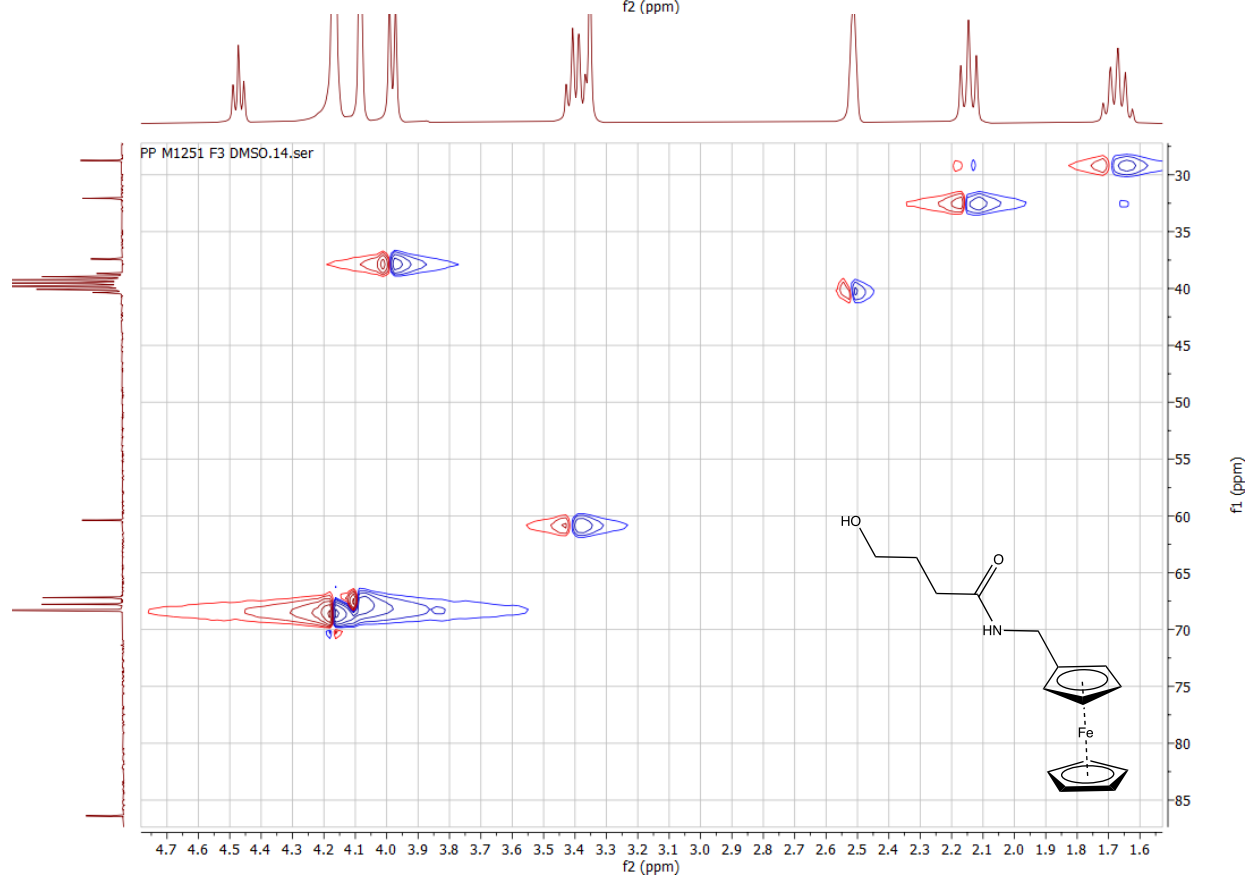
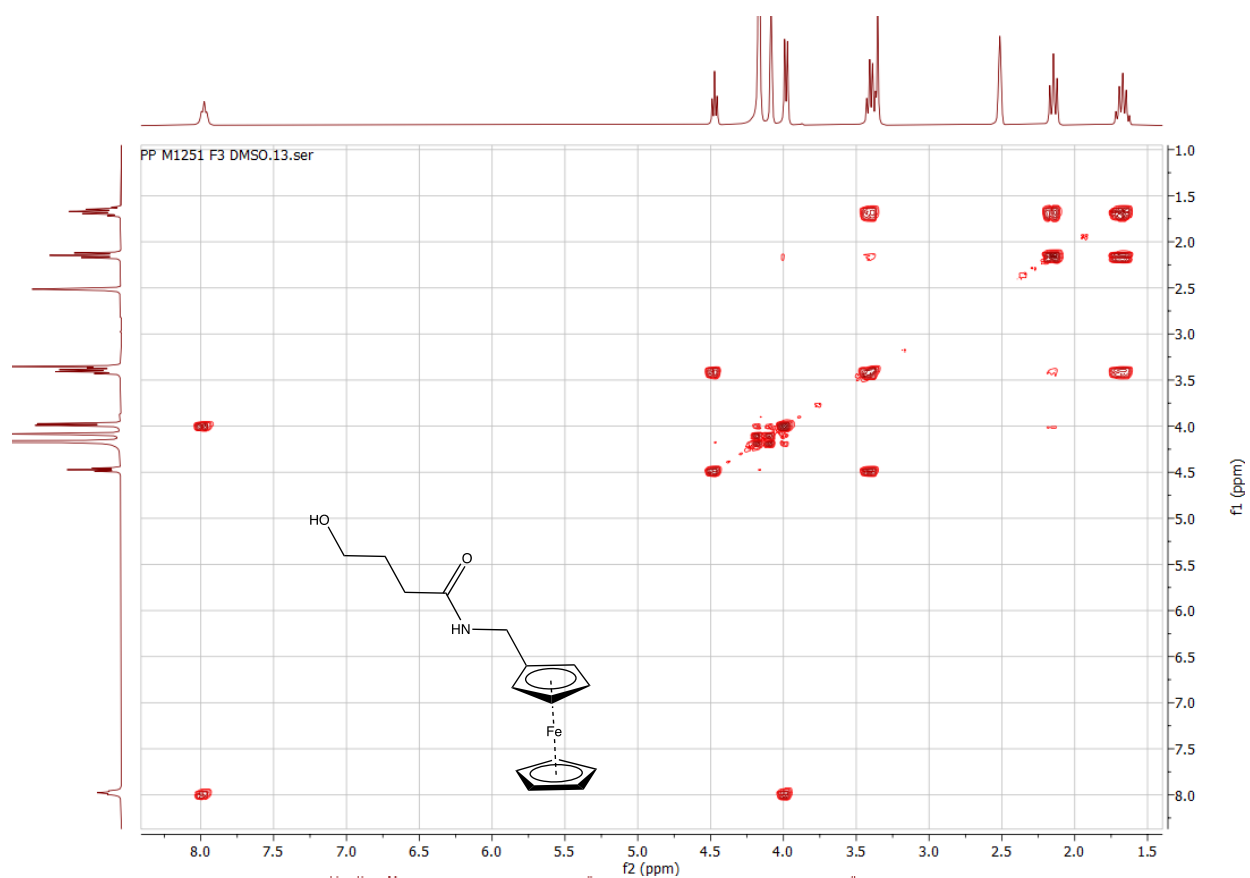
Error = 0.3 ppm; Relative Intensity (%) 100

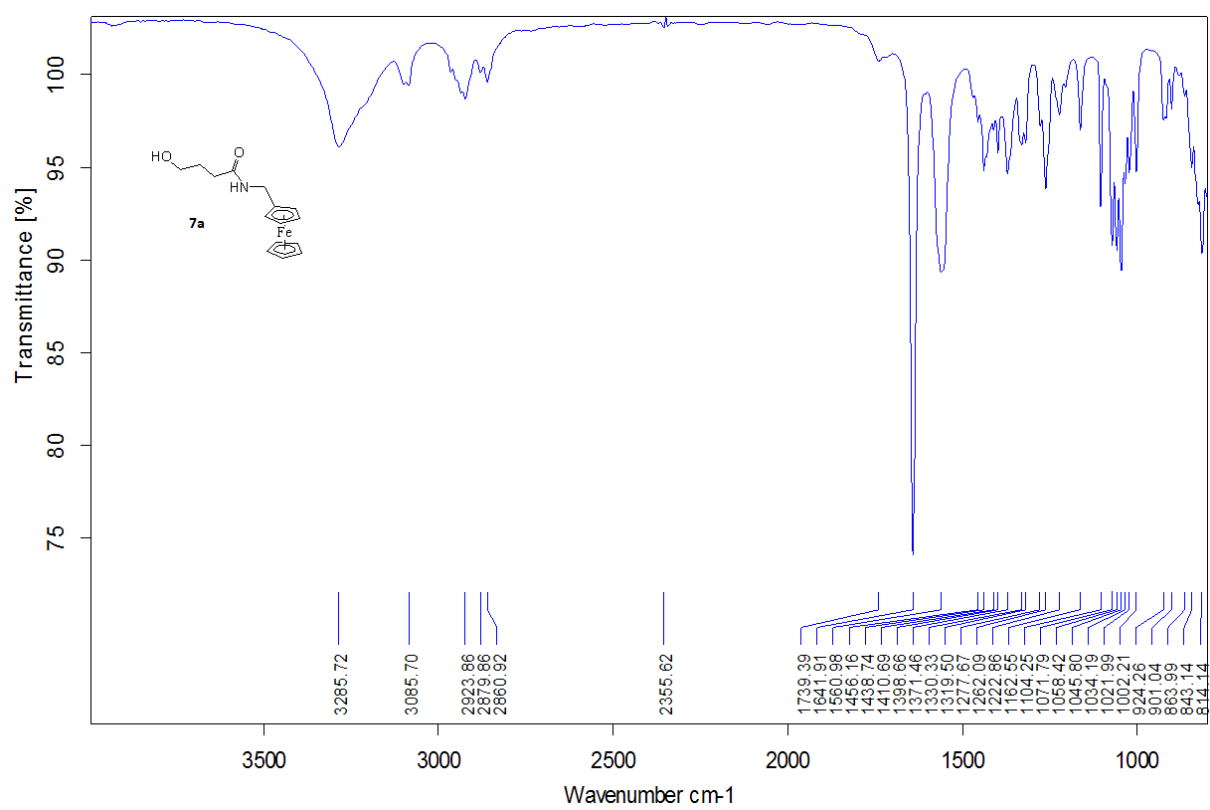
HRMS (ESI) m/z: [M]<sup>+</sup> Calcd for C<sub>15</sub>H<sub>17</sub>FeNO<sub>2</sub> 299.0603 . Found 299.0604; (Error: 0.3 ppm).



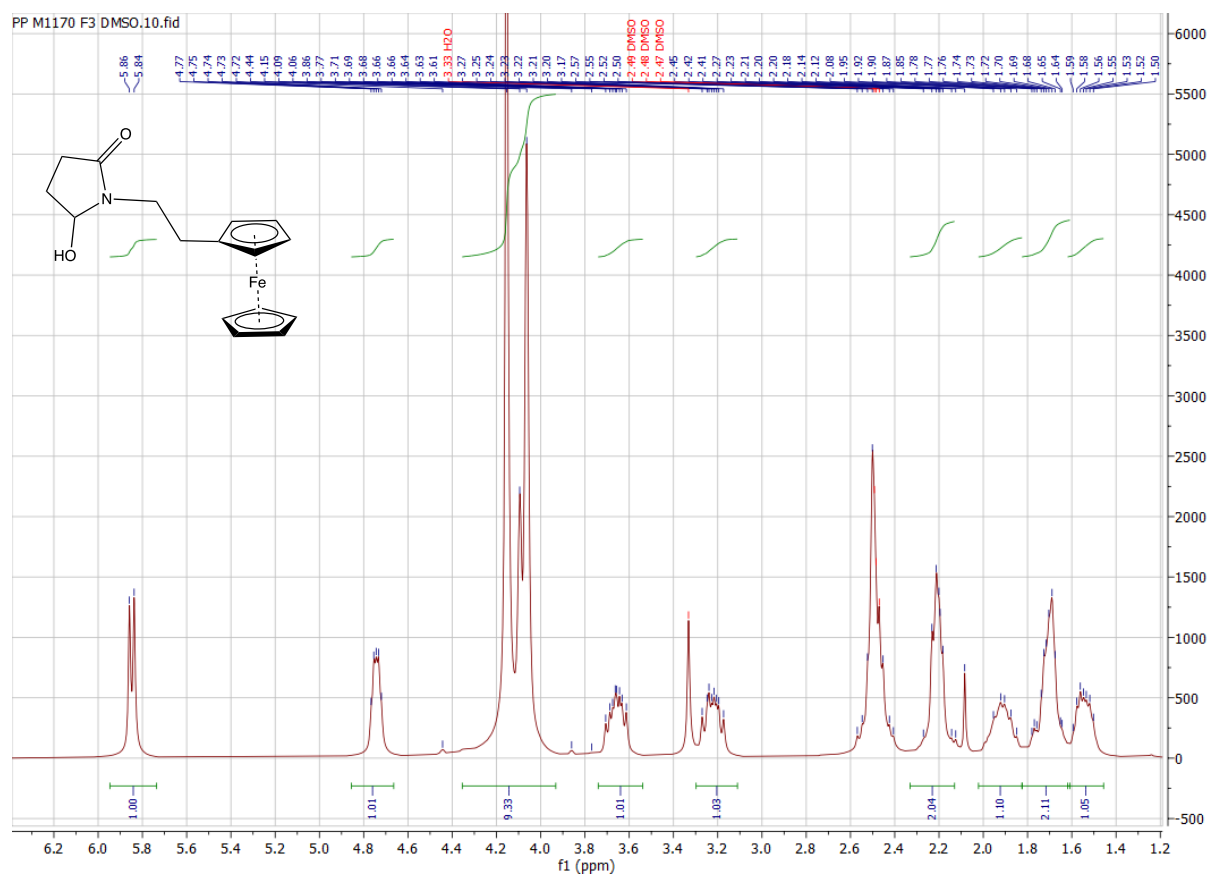
**Figure S19:**  $^1\text{H}$  (in  $\text{DMSO-d}_6$ ),  $^{13}\text{C}$  (in  $\text{DMSO-d}_6$ ), COSY (in  $\text{DMSO-d}_6$ ), HMQC (in  $\text{DMSO-d}_6$ ) NMR and IR data for compound **7a**

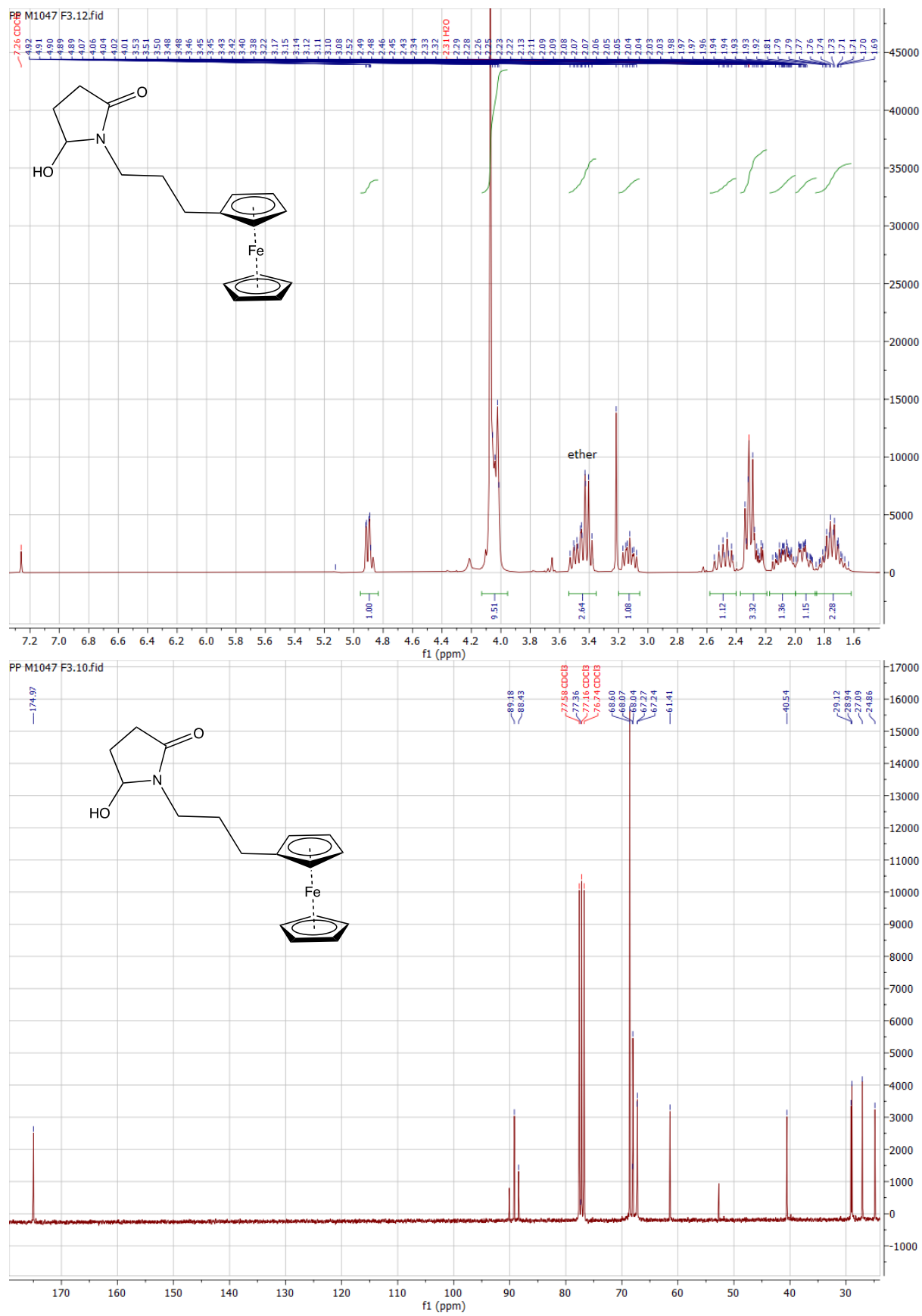




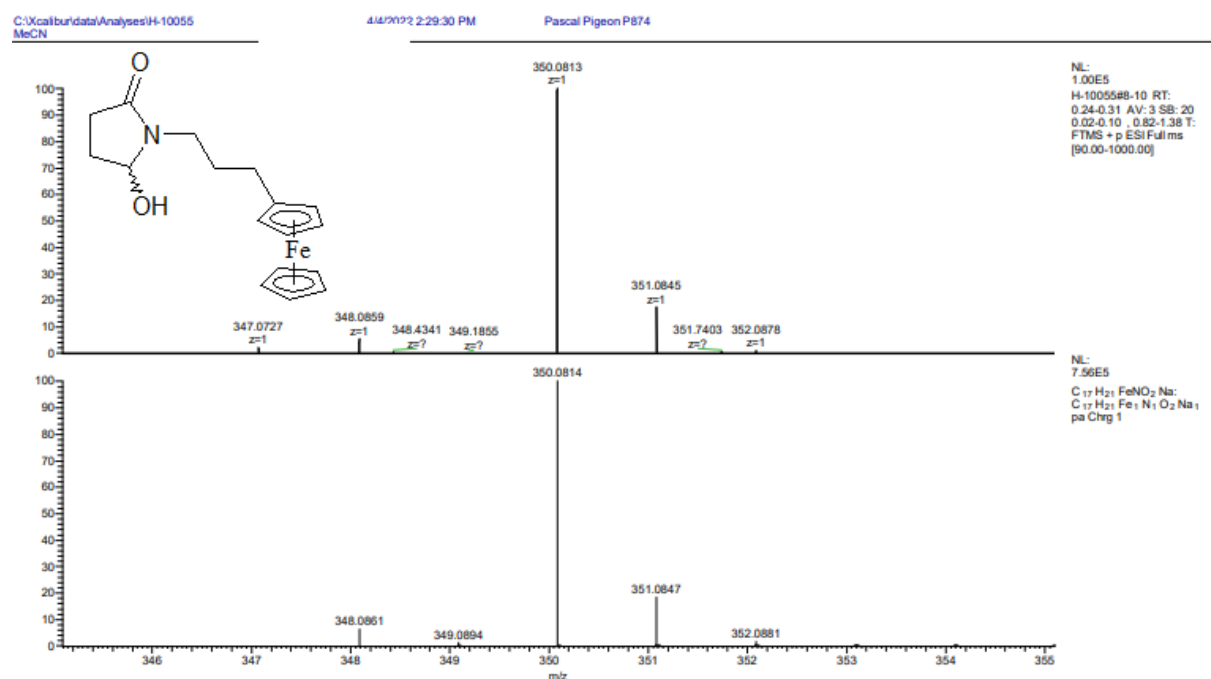
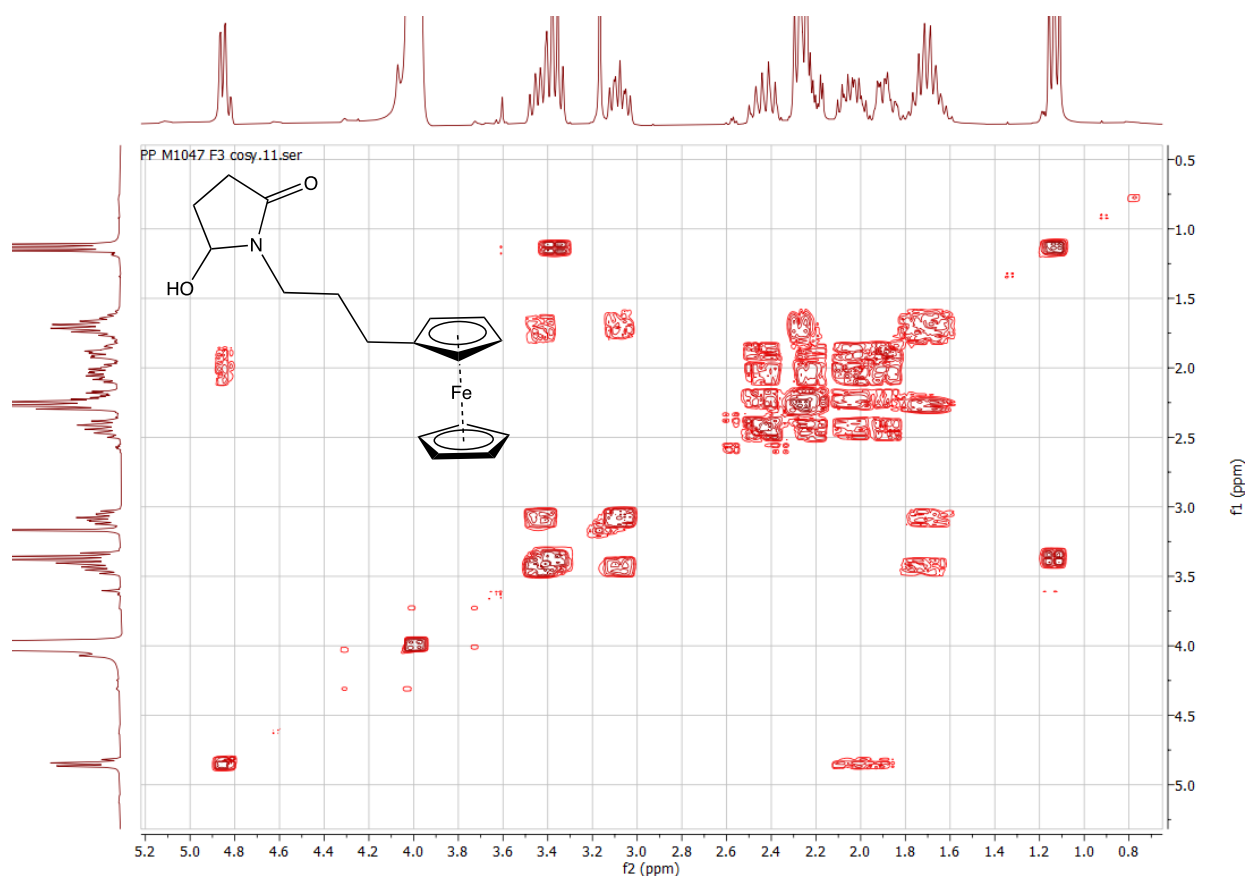


**Figure S20:**  $^1\text{H}$  (in  $\text{DMSO-d}_6$ ) NMR for compound **6b**





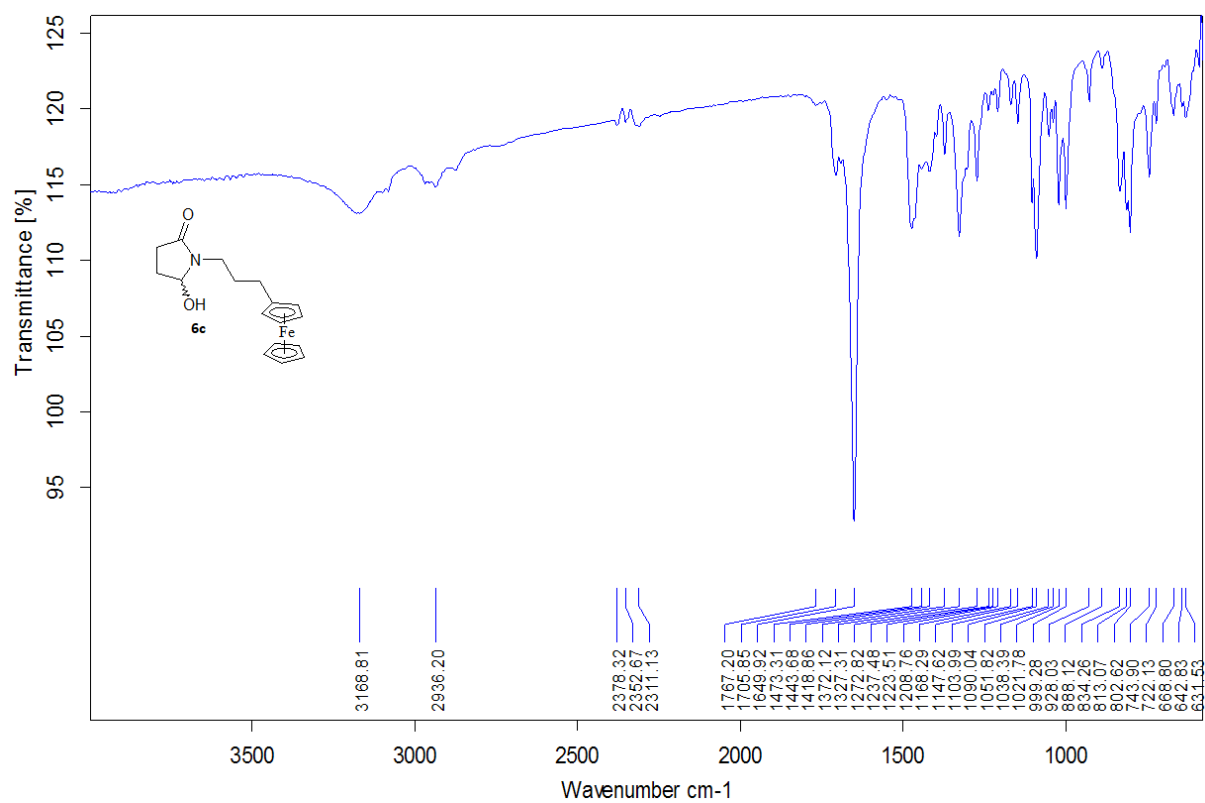




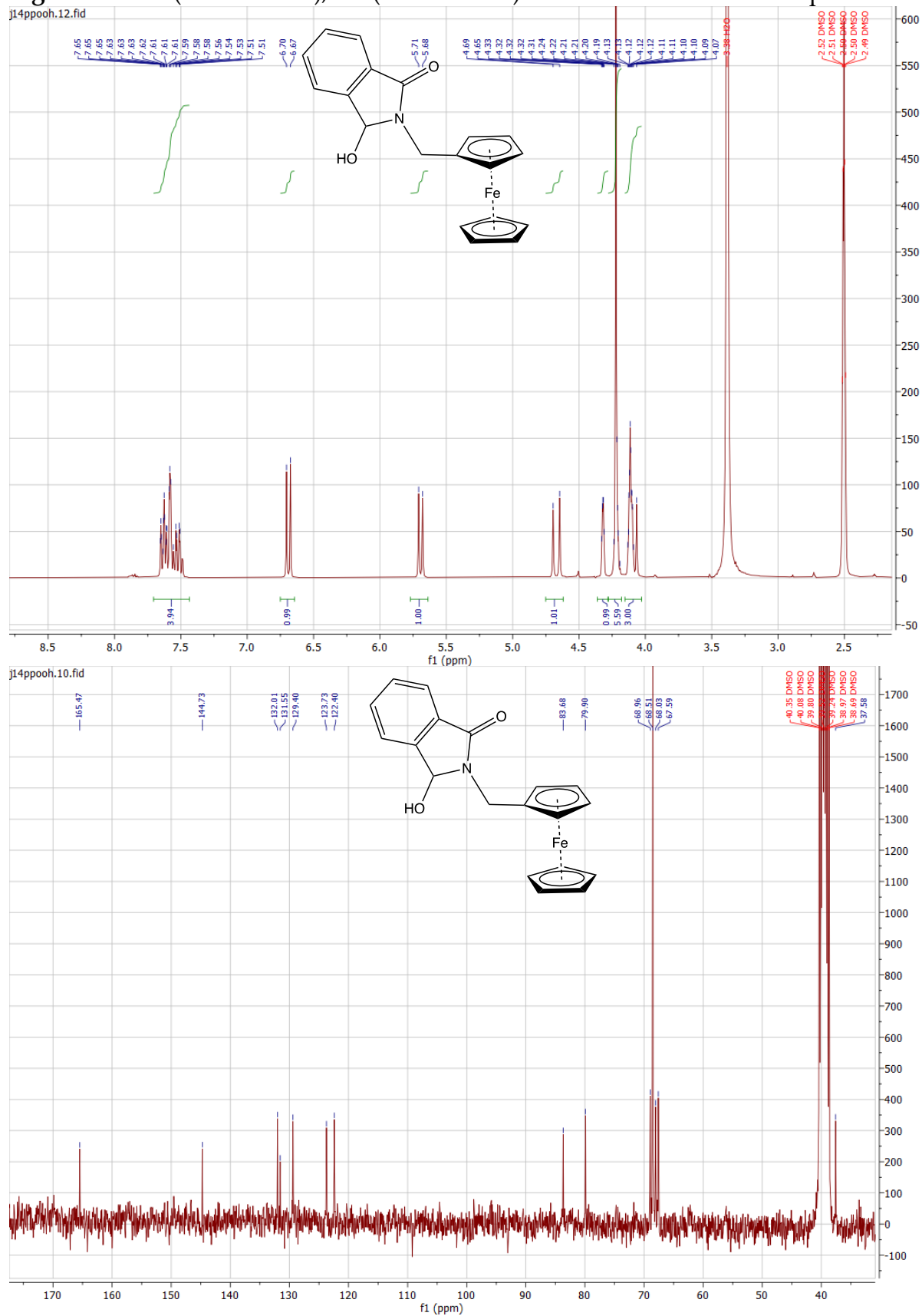
## Experimental/theoretical isotopic pattern MS spectrum

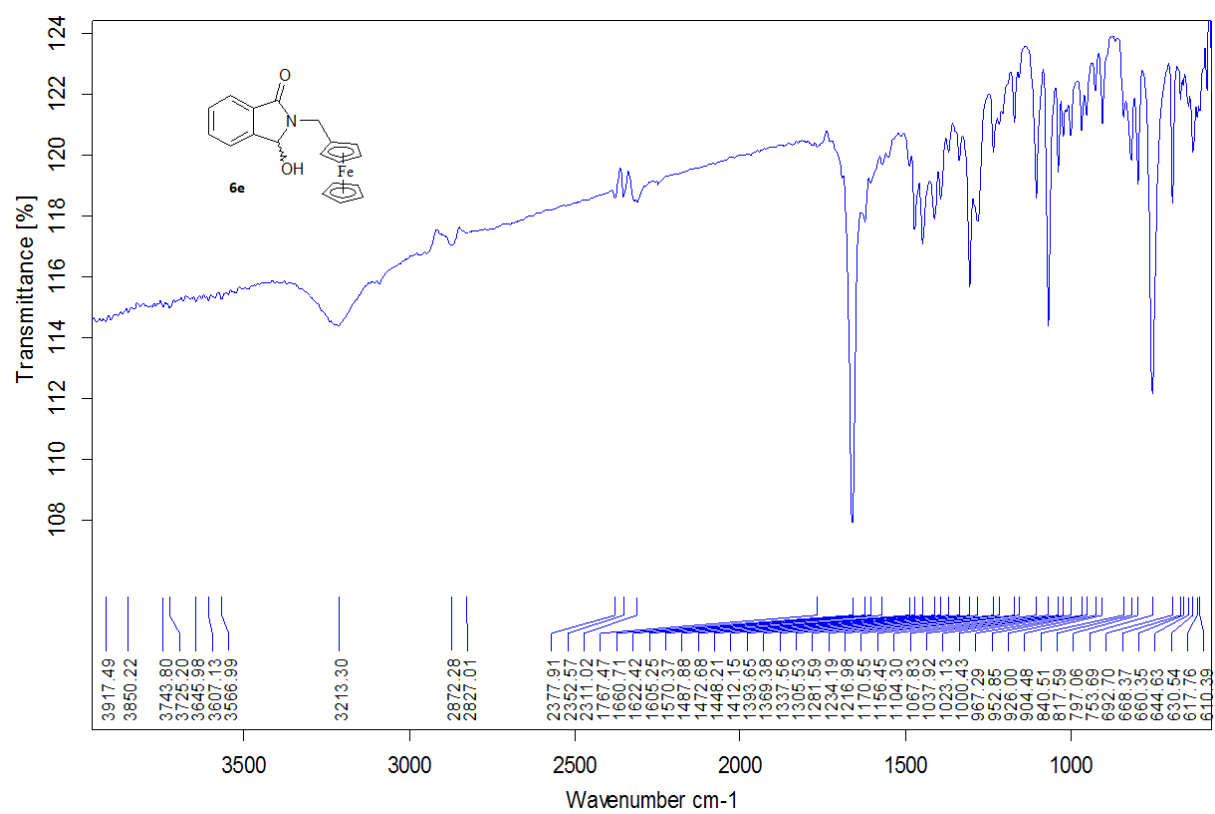
Error = -0.2 ppm; Relative Intensity (%) 100

HRMS (ESI) m/z: [M+Na]<sup>+</sup> Calcd for C<sub>17</sub>H<sub>21</sub>FeNO<sub>2</sub>Na 350.0814. Found 350.0813; (Error: -0.2 ppm).



**Figure S22:**  $^1\text{H}$  (in  $\text{DMSO-d}_6$ ),  $^{13}\text{C}$  (in  $\text{DMSO-d}_6$ ) NMR and IR data for compound **6e**





**1H NMR spectrum of compound 1 in DMSO-d<sub>6</sub>.**

**Chemical structure of compound 1:** O=C1c2ccccc2n(c1)CCc3ccc4c(c3)Fe(c5ccccc54)C6=CC=CC=C6

**Peak list (ppm):** 7.67, 7.66, 7.65, 7.64, 7.63, 7.62, 7.61, 7.60, 7.59, 7.58, 7.57, 7.56, 7.55, 7.53, 7.51, 7.50, 6.63, 6.62, 6.61, 6.60, 6.59, 6.58, 6.57, 6.56, 6.55, 6.54, 6.53, 6.52, 6.51, 6.50, 6.49, 6.48, 6.47, 6.46, 6.45, 6.44, 6.43, 6.42, 6.41, 6.40, 6.39, 6.38, 6.37, 6.36, 6.35, 6.34, 6.33, 6.32, 6.31, 6.30, 6.29, 6.28, 6.27, 6.26, 6.25, 6.24, 6.23, 6.22, 6.21, 6.20, 6.19, 6.18, 6.17, 6.16, 6.15, 6.14, 6.13, 6.12, 6.11, 6.10, 6.09, 6.08, 6.07, 6.06, 6.05, 6.04, 6.03, 6.02, 6.01, 6.00, 5.99, 5.98, 5.97, 5.96, 5.95, 5.94, 5.93, 5.92, 5.91, 5.90, 5.89, 5.88, 5.87, 5.86, 5.85, 5.84, 5.83, 5.82, 5.81, 5.80, 5.79, 5.78, 5.77, 5.76, 5.75, 5.74, 5.73, 5.72, 5.71, 5.70, 5.69, 5.68, 5.67, 5.66, 5.65, 5.64, 5.63, 5.62, 5.61, 5.60, 5.59, 5.58, 5.57, 5.56, 5.55, 5.54, 5.53, 5.52, 5.51, 5.50, 5.49, 5.48, 5.47, 5.46, 5.45, 5.44, 5.43, 5.42, 5.41, 5.40, 5.39, 5.38, 5.37, 5.36, 5.35, 5.34, 5.33, 5.32, 5.31, 5.30, 5.29, 5.28, 5.27, 5.26, 5.25, 5.24, 5.23, 5.22, 5.21, 5.20, 5.19, 5.18, 5.17, 5.16, 5.15, 5.14, 5.13, 5.12, 5.11, 5.10, 5.09, 5.08, 5.07, 5.06, 5.05, 5.04, 5.03, 5.02, 5.01, 5.00, 4.99, 4.98, 4.97, 4.96, 4.95, 4.94, 4.93, 4.92, 4.91, 4.90, 4.89, 4.88, 4.87, 4.86, 4.85, 4.84, 4.83, 4.82, 4.81, 4.80, 4.79, 4.78, 4.77, 4.76, 4.75, 4.74, 4.73, 4.72, 4.71, 4.70, 4.69, 4.68, 4.67, 4.66, 4.65, 4.64, 4.63, 4.62, 4.61, 4.60, 4.59, 4.58, 4.57, 4.56, 4.55, 4.54, 4.53, 4.52, 4.51, 4.50, 4.49, 4.48, 4.47, 4.46, 4.45, 4.44, 4.43, 4.42, 4.41, 4.40, 4.39, 4.38, 4.37, 4.36, 4.35, 4.34, 4.33, 4.32, 4.31, 4.30, 4.29, 4.28, 4.27, 4.26, 4.25, 4.24, 4.23, 4.22, 4.21, 4.20, 4.19, 4.18, 4.17, 4.16, 4.15, 4.14, 4.13, 4.12, 4.11, 4.10, 4.09, 4.08, 4.07, 4.06, 4.05, 4.04, 4.03, 4.02, 4.01, 4.00, 3.99, 3.98, 3.97, 3.96, 3.95, 3.94, 3.93, 3.92, 3.91, 3.90, 3.89, 3.88, 3.87, 3.86, 3.85, 3.84, 3.83, 3.82, 3.81, 3.80, 3.79, 3.78, 3.77, 3.76, 3.75, 3.74, 3.73, 3.72, 3.71, 3.70, 3.69, 3.68, 3.67, 3.66, 3.65, 3.64, 3.63, 3.62, 3.61, 3.60, 3.59, 3.58, 3.57, 3.56, 3.55, 3.54, 3.53, 3.52, 3.51, 3.50, 3.49, 3.48, 3.47, 3.46, 3.45, 3.44, 3.43, 3.42, 3.41, 3.40, 3.39, 3.38, 3.37, 3.36, 3.35, 3.34, 3.33, 3.32, 3.31, 3.30, 3.29, 3.28, 3.27, 3.26, 3.25, 3.24, 3.23, 3.22, 3.21, 3.20, 3.19, 3.18, 3.17, 3.16, 3.15, 3.14, 3.13, 3.12, 3.11, 3.10, 3.09, 3.08, 3.07, 3.06, 3.05, 3.04, 3.03, 3.02, 3.01, 3.00, 2.99, 2.98, 2.97, 2.96, 2.95, 2.94, 2.93, 2.92, 2.91, 2.90, 2.89, 2.88, 2.87, 2.86, 2.85, 2.84, 2.83, 2.82, 2.81, 2.80, 2.79, 2.78, 2.77, 2.76, 2.75, 2.74, 2.73, 2.72, 2.71, 2.70, 2.69, 2.68, 2.67, 2.66, 2.65, 2.64, 2.63, 2.62, 2.61, 2.60, 2.59, 2.58, 2.57, 2.56, 2.55, 2.54, 2.53, 2.52, 2.51, 2.50, 2.49, 2.48, 2.47, 2.46, 2.45, 2.44, 2.43, 2.42, 2.41, 2.40, 2.39, 2.38, 2.37, 2.36, 2.35, 2.34, 2.33, 2.32, 2.31, 2.30, 2.29, 2.28, 2.27, 2.26, 2.25, 2.24, 2.23, 2.22, 2.21, 2.20, 2.19, 2.18, 2.17, 2.16, 2.15, 2.14, 2.13, 2.12, 2.11, 2.10, 2.09, 2.08, 2.07, 2.06, 2.05, 2.04, 2.03, 2.02, 2.01, 2.00, 1.99, 1.98, 1.97, 1.96, 1.95, 1.94, 1.93, 1.92, 1.91, 1.90, 1.89, 1.88, 1.87, 1.86, 1.85, 1.84, 1.83, 1.82, 1.81, 1.80, 1.79, 1.78, 1.77, 1.76, 1.75, 1.74, 1.73, 1.72, 1.71, 1.70, 1.69, 1.68, 1.67, 1.66, 1.65, 1.64, 1.63, 1.62, 1.61, 1.60, 1.59, 1.58, 1.57, 1.56, 1.55, 1.54, 1.53, 1.52, 1.51, 1.50, 1.49, 1.48, 1.47, 1.46, 1.45, 1.44, 1.43, 1.42, 1.41, 1.40, 1.39, 1.38, 1.37, 1.36, 1.35, 1.34, 1.33, 1.32, 1.31, 1.30, 1.29, 1.28, 1.27, 1.26, 1.25, 1.24, 1.23, 1.22, 1.21, 1.20, 1.19, 1.18, 1.17, 1.16, 1.15, 1.14, 1.13, 1.12, 1.11, 1.10, 1.09, 1.08, 1.07, 1.06, 1.05, 1.04, 1.03, 1.02, 1.01, 1.00, 0.99, 0.98, 0.97, 0.96, 0.95, 0.94, 0.93, 0.92, 0.91, 0.90, 0.89, 0.88, 0.87, 0.86, 0.85, 0.84, 0.83, 0.82, 0.81, 0.80, 0.79, 0.78, 0.77, 0.76, 0.75, 0.74, 0.73, 0.72, 0.71, 0.70, 0.69, 0.68, 0.67, 0.66, 0.65, 0.64, 0.63, 0.62, 0.61, 0.60, 0.59, 0.58, 0.57, 0.56, 0.55, 0.54, 0.53, 0.52, 0.51, 0.50, 0.49, 0.48, 0.47, 0.46, 0.45, 0.44, 0.43, 0.42, 0



# Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 100.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 9

Monoisotopic Mass, Odd Electron Ions

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

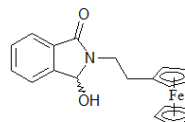
Elements Used:

C: 1-150 H: 1-150 N: 0-3 O: 0-10 Fe: 1-1

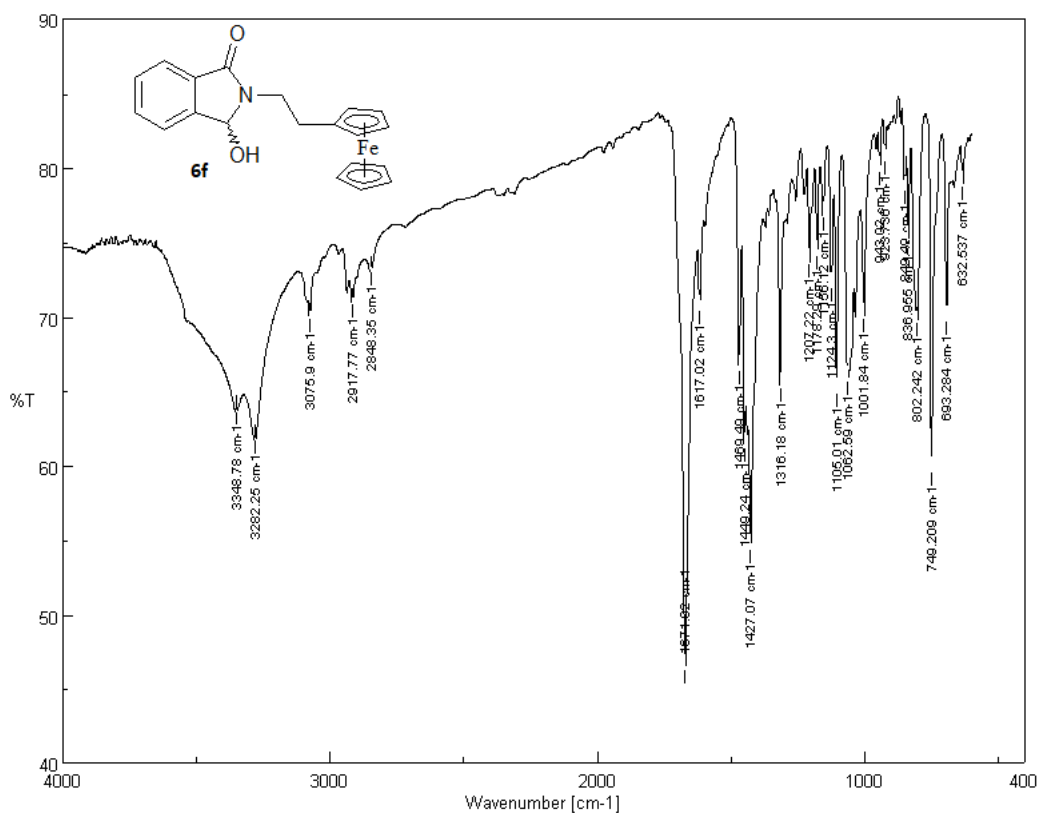
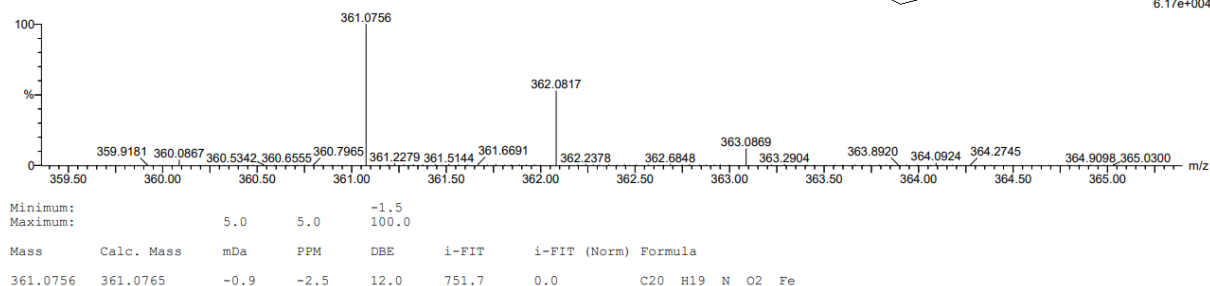
19-Jun-2013 2:5:3

ENSCP\_P677 37 (0.932) Cm (31.44)

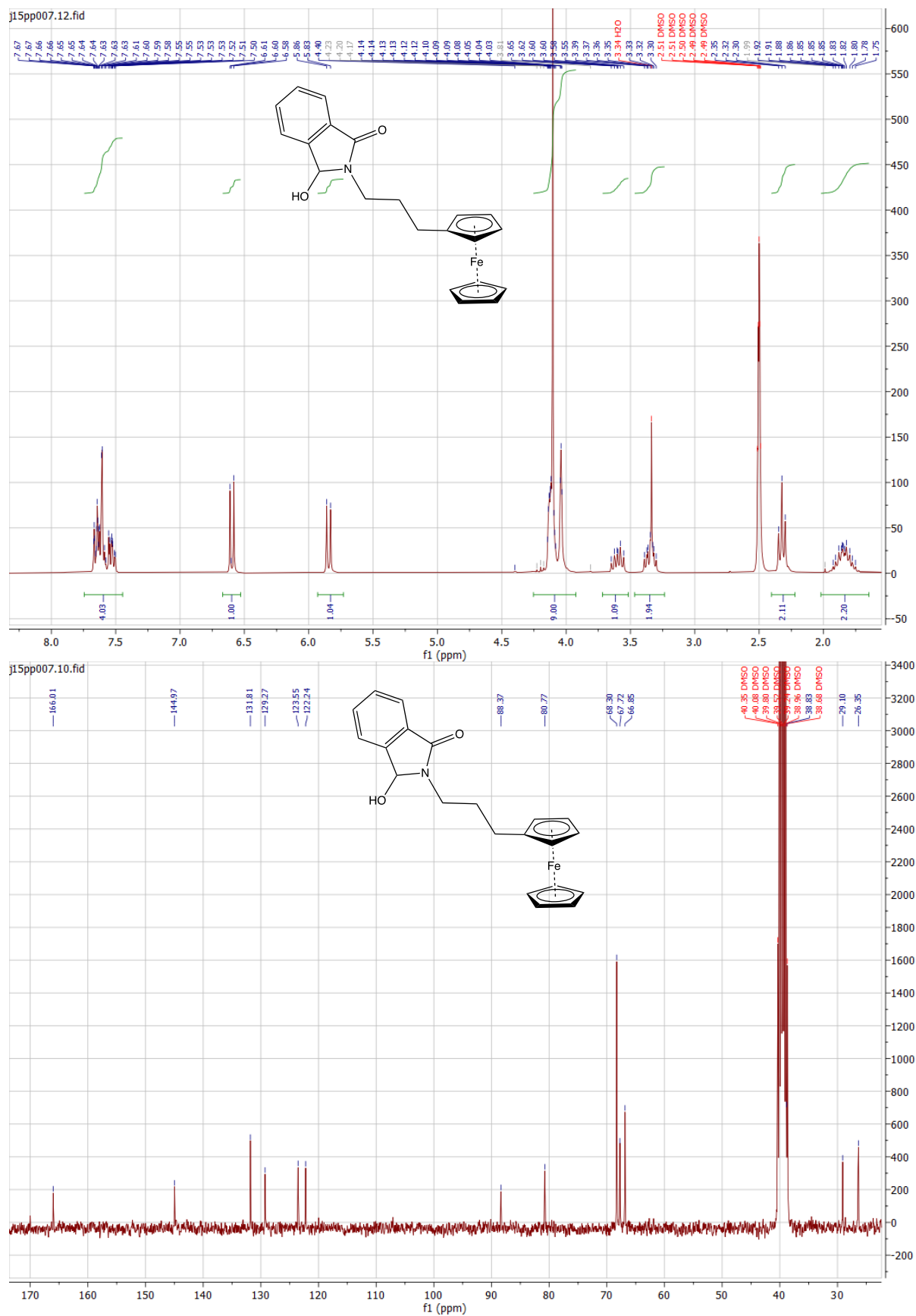
ACN



LCT Premier XE KE483  
1: TOF MS ES+  
6.17e+004



**Figure S24:**  $^1\text{H}$  (in  $\text{DMSO-d}_6$ ),  $^{13}\text{C}$  (in  $\text{DMSO-d}_6$ ) NMR, HR-MS and IR data for compound **6g**



# Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 100.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 9

Monoisotopic Mass, Odd Electron Ions

160 formula(e) evaluated with 2 results within limits (all results (up to 1000) for each mass)

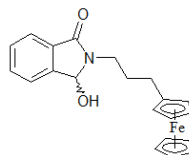
Elements Used:

C: 1-150 H: 1-150 N: 0-3 O: 0-10 Fe: 1-1

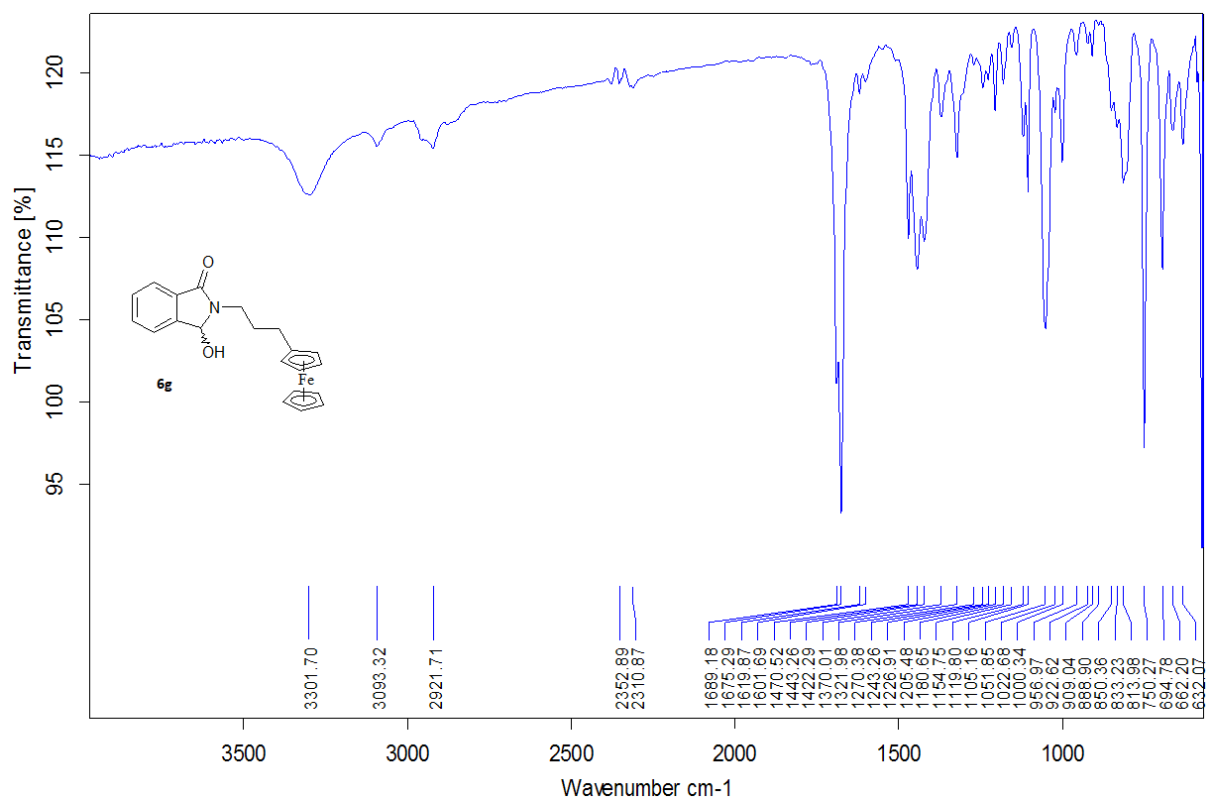
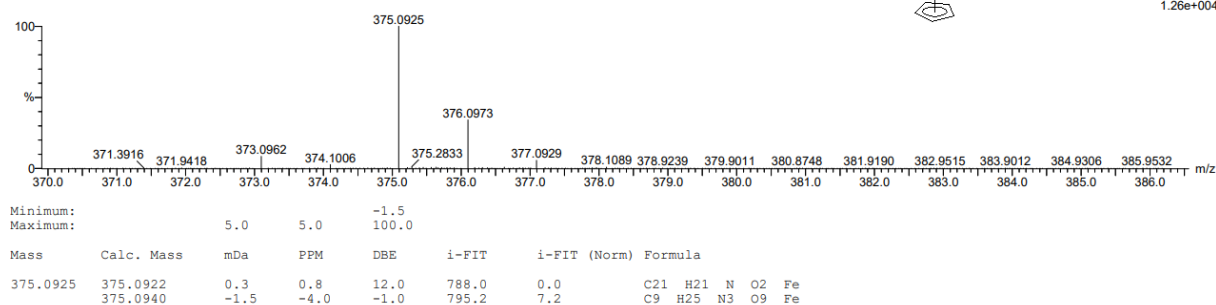
19-Jun-2013 3:00:1

ENSCP\_P678 49 (1.206) Cm (48:58)

ACN

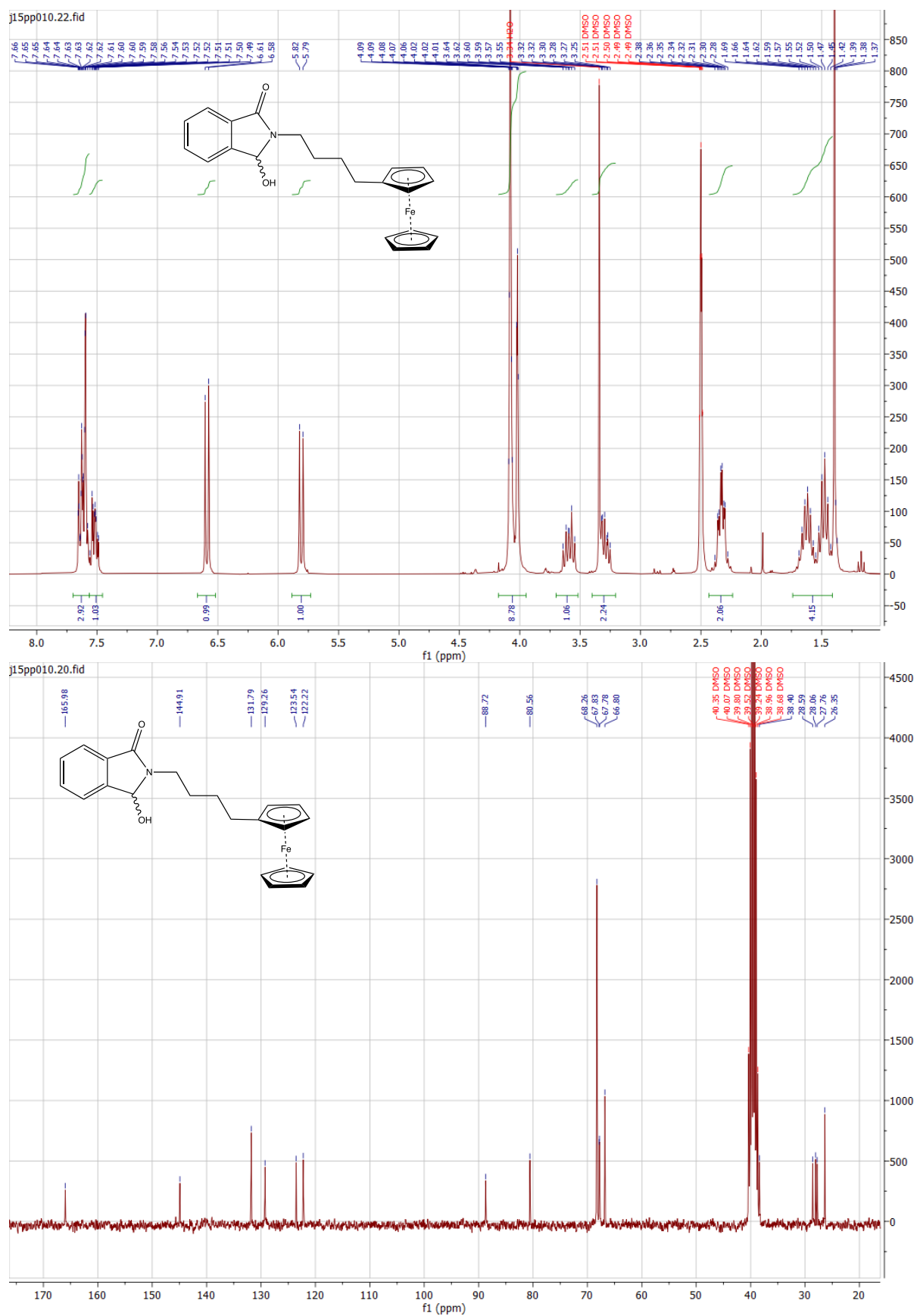


LCT Premier XE KE483  
1: TOF MS ES+  
1.26e+004





**Figure S25:**  $^1\text{H}$  (in  $\text{DMSO-d}_6$ ) and  $^{13}\text{C}$  (in  $\text{DMSO-d}_6$ ) NMR and HR-MS data for compound **6h**



### Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 100.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 9

Monoisotopic Mass, Odd Electron Ions

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

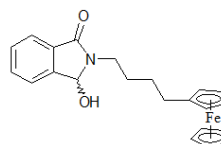
Elements Used:

C: 0-100 H: 1-120 N: 0-10 O: 0-10 Fe: 1-1

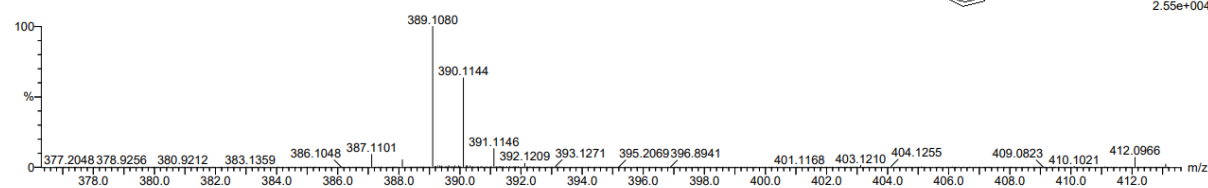
06-Sep-2013 5:7:4

ENSCP\_P679 29 (0.753) Cm (29:39)

MeOH



LCT Premier XE KE483  
1: TOF MS ES+  
2.55e+004



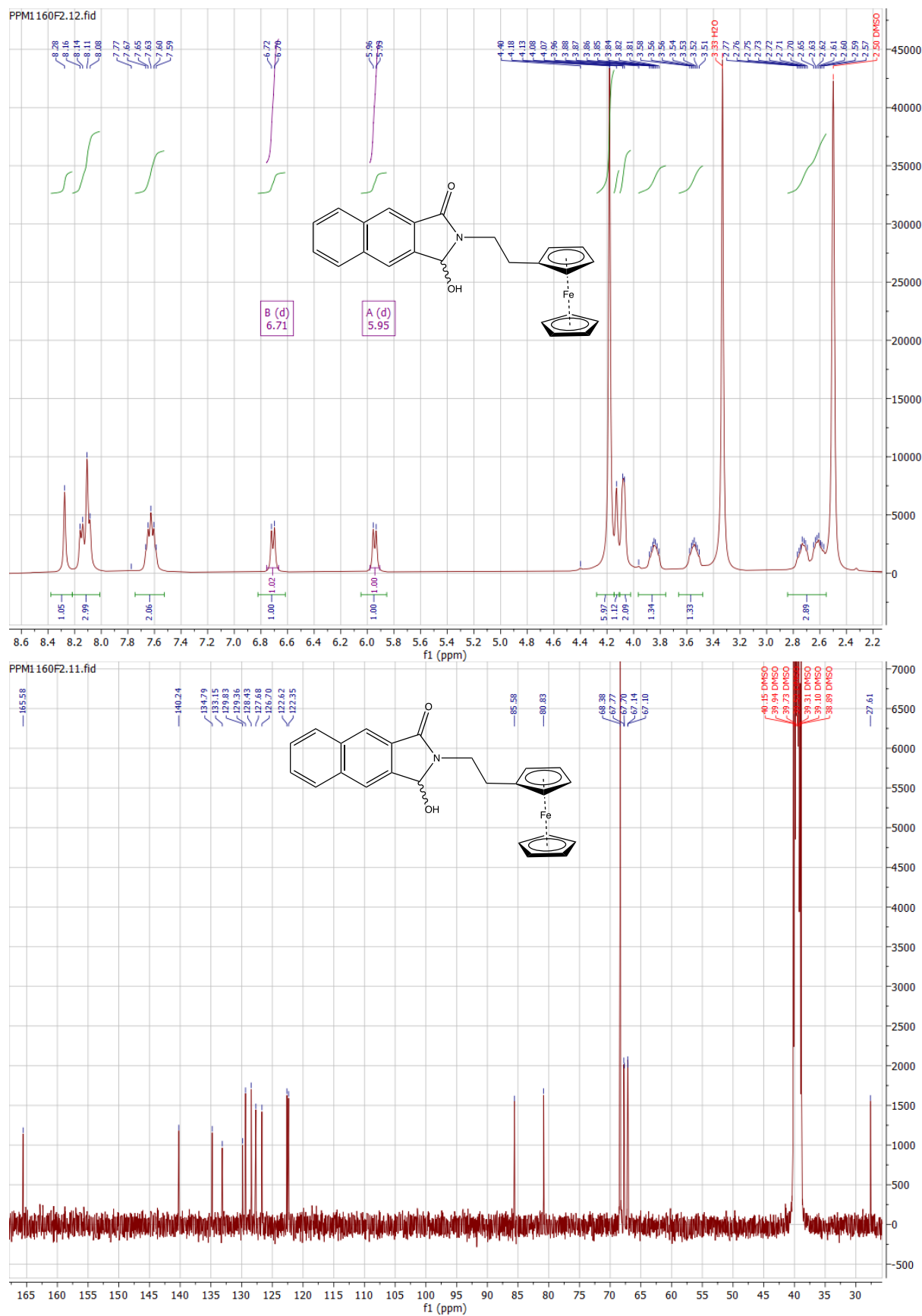
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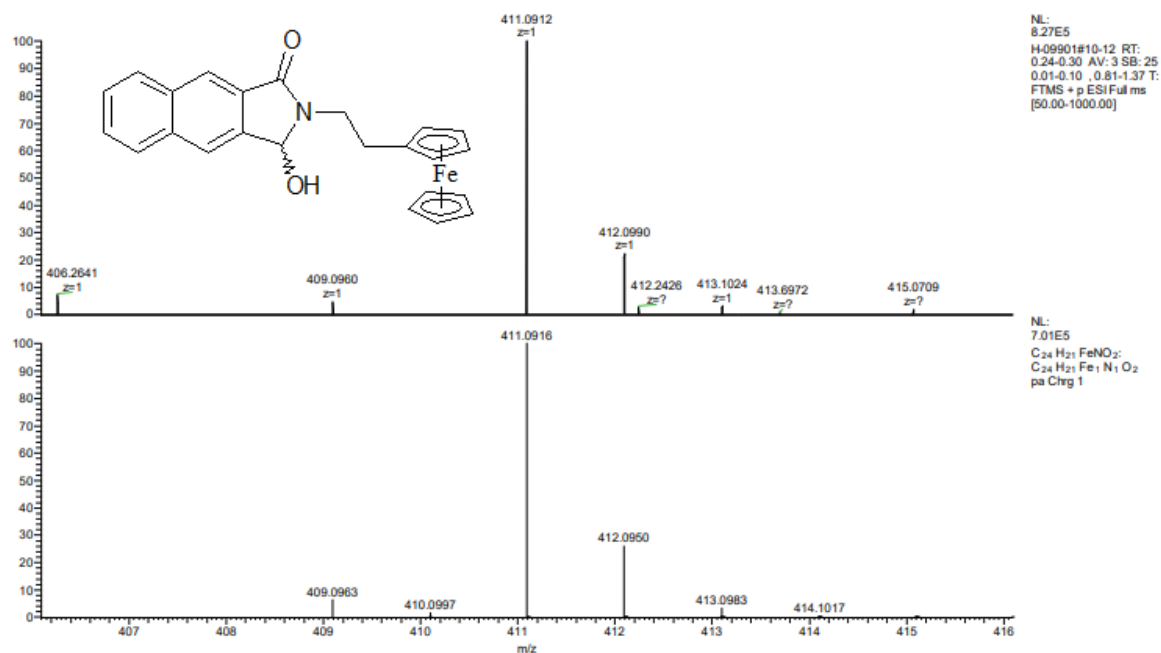
Maximum: 5.0 5.0 -1.5

Mass Calc. Mass mDa PPM DBE i-FIT i-FIT (Norm) Formula

389.1080	389.1078	0.2	0.5	12.0	1020.1	0.0	C22 H23 N O2 Fe
	389.1097	-1.7	-4.4	-1.0	1023.3	3.2	C10 H27 N3 O9 Fe
	389.1070	1.0	2.6	0.0	1026.1	6.1	C6 H23 N9 O7 Fe

**Figure S26:**  $^1\text{H}$  (in  $\text{DMSO-d}_6$ ),  $^{13}\text{C}$  (in  $\text{DMSO-d}_6$ ) NMR, HR-MS and IR data for compound **6i**

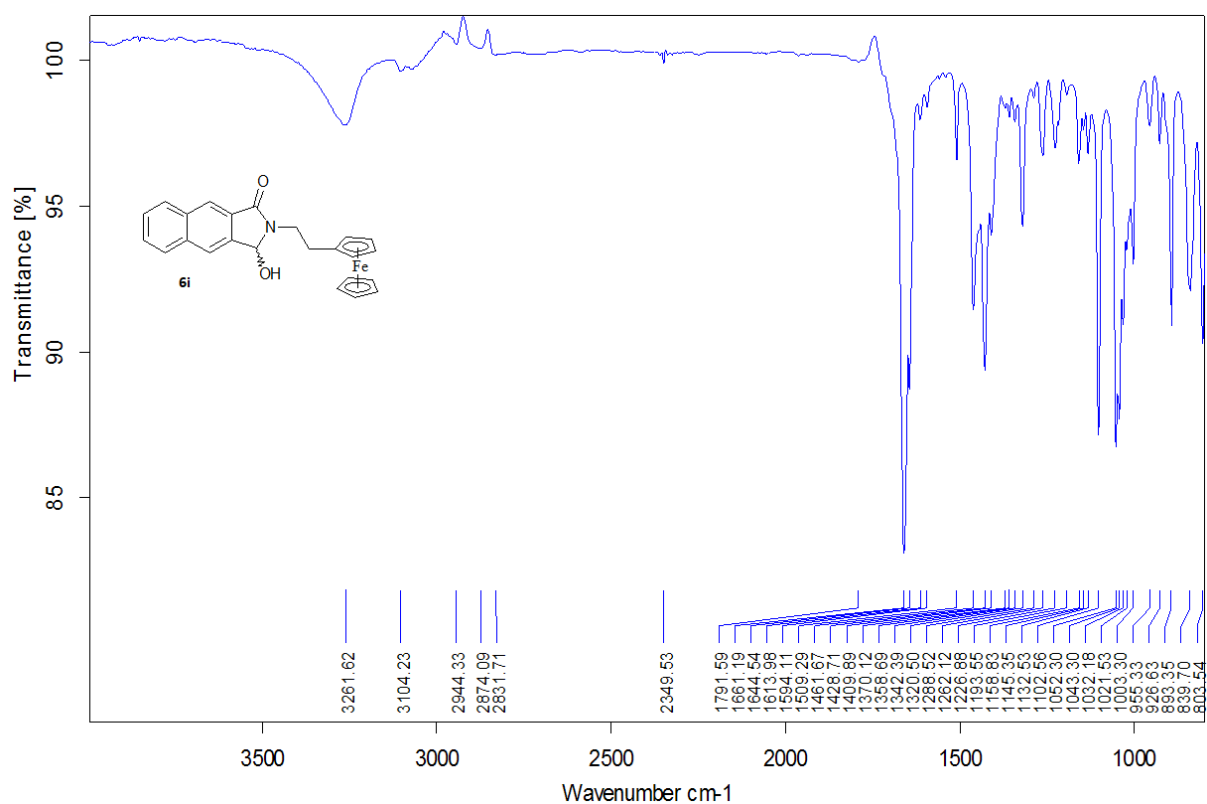




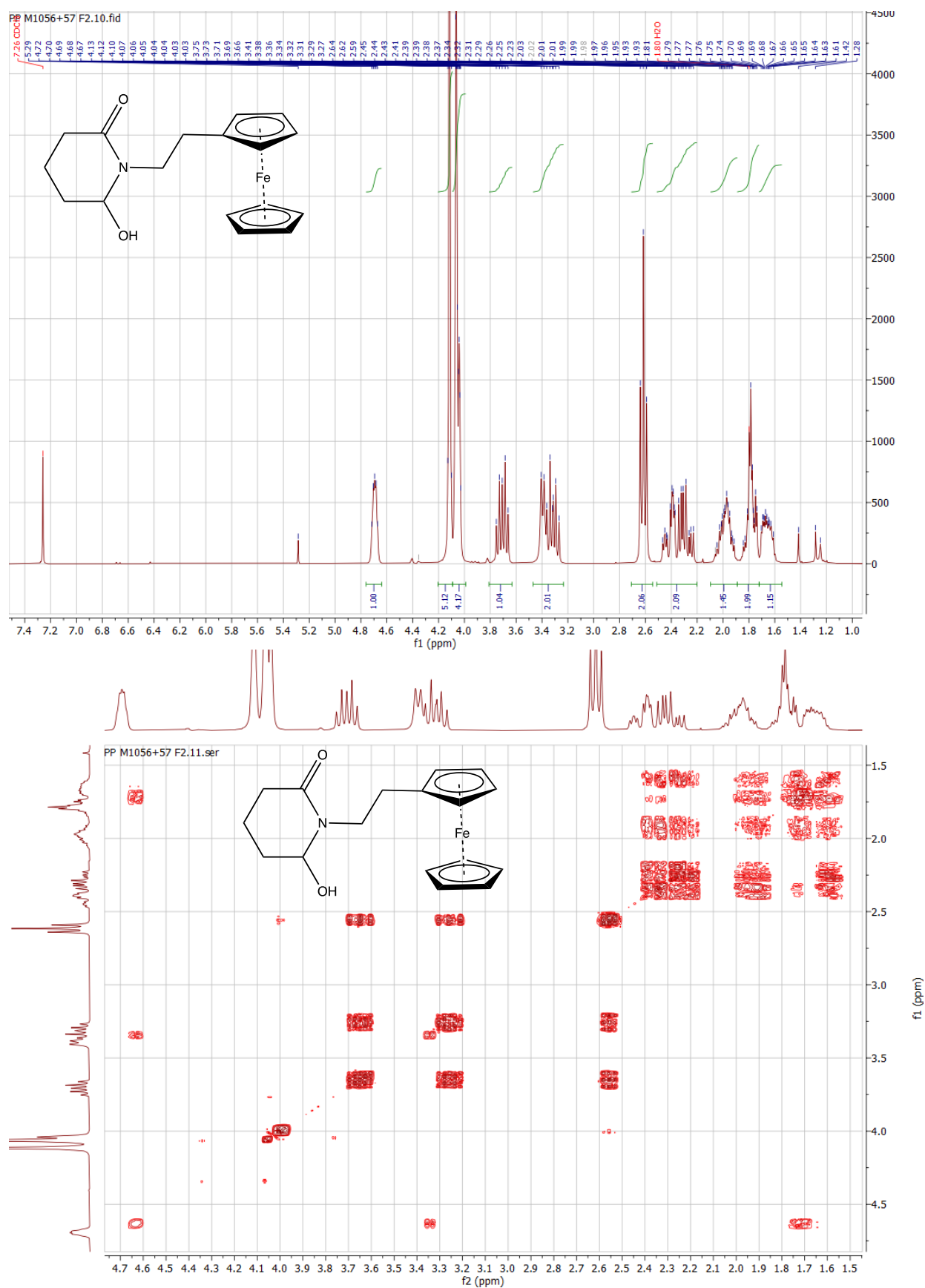
## Experimental/theoretical isotopic pattern MS spectrum

Error = -1.0 ppm; Relative Intensity (%) 100

HRMS (ESI) m/z: [M]<sup>+</sup> Calcd for C<sub>24</sub>H<sub>21</sub>FeNO<sub>2</sub> 411.0916 . Found 411.0912; (Error: -1.0 ppm).



**Figure S27:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ), COSY (in  $\text{CDCl}_3$ ) NMR data for compound **6j**



PP M1057 F3.10.fid

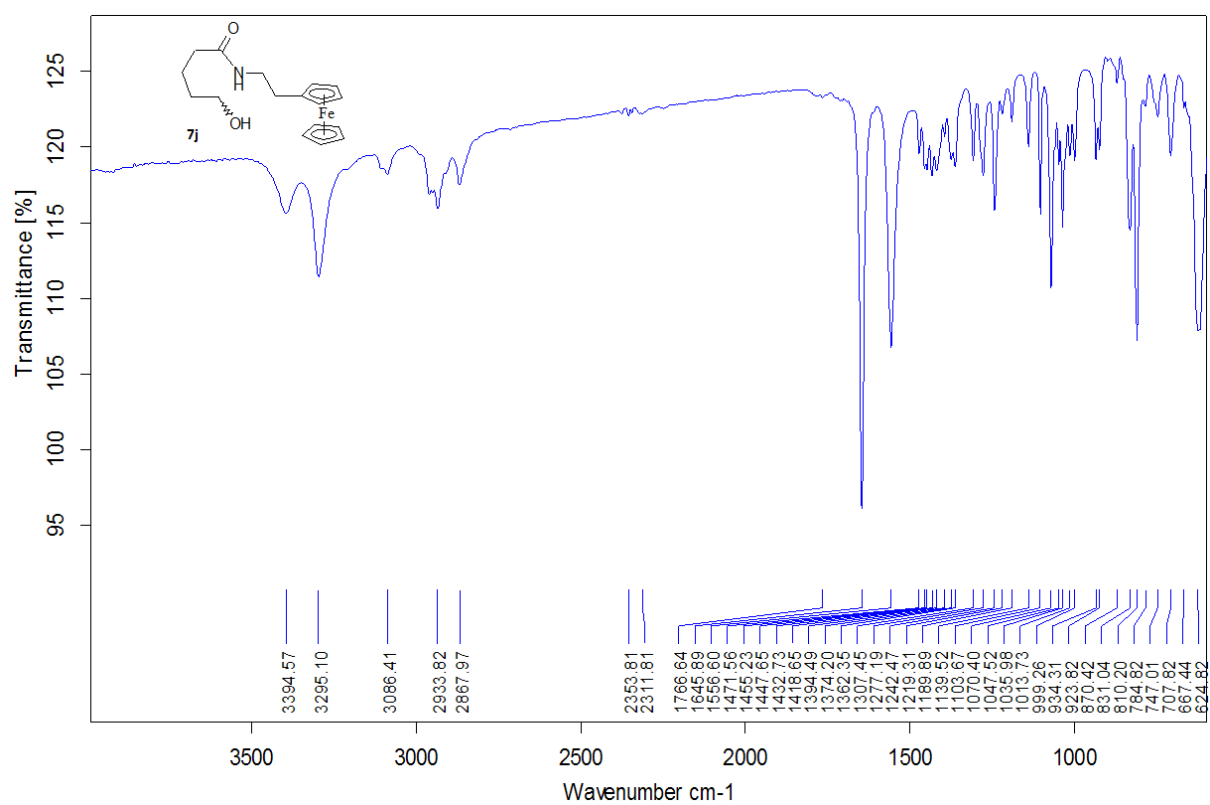
Chemical structure: OC(=O)CCCCNCc1ccc2c(c1)[Fe]3C=CC=CC=3C2

<sup>1</sup>H NMR spectrum (CDCl<sub>3</sub>) showing peaks from 1.4 to 7.5 ppm. Key features include a broad peak at 7.26 ppm (NH), a multiplet at 5.66 ppm (aromatic), a sharp peak at 4.14 ppm (CH<sub>2</sub>), and a complex multiplet between 1.4 and 2.6 ppm (aliphatic). Integration values are provided for several regions: 1.00, 10.19, 2.33, 2.21, 2.30, 1.00, 1.07, 3.31, and 2.44. Peak counts are also indicated: D (t) 3.64, C (q) 3.37, B (t) 2.53, and A (t) 2.20.

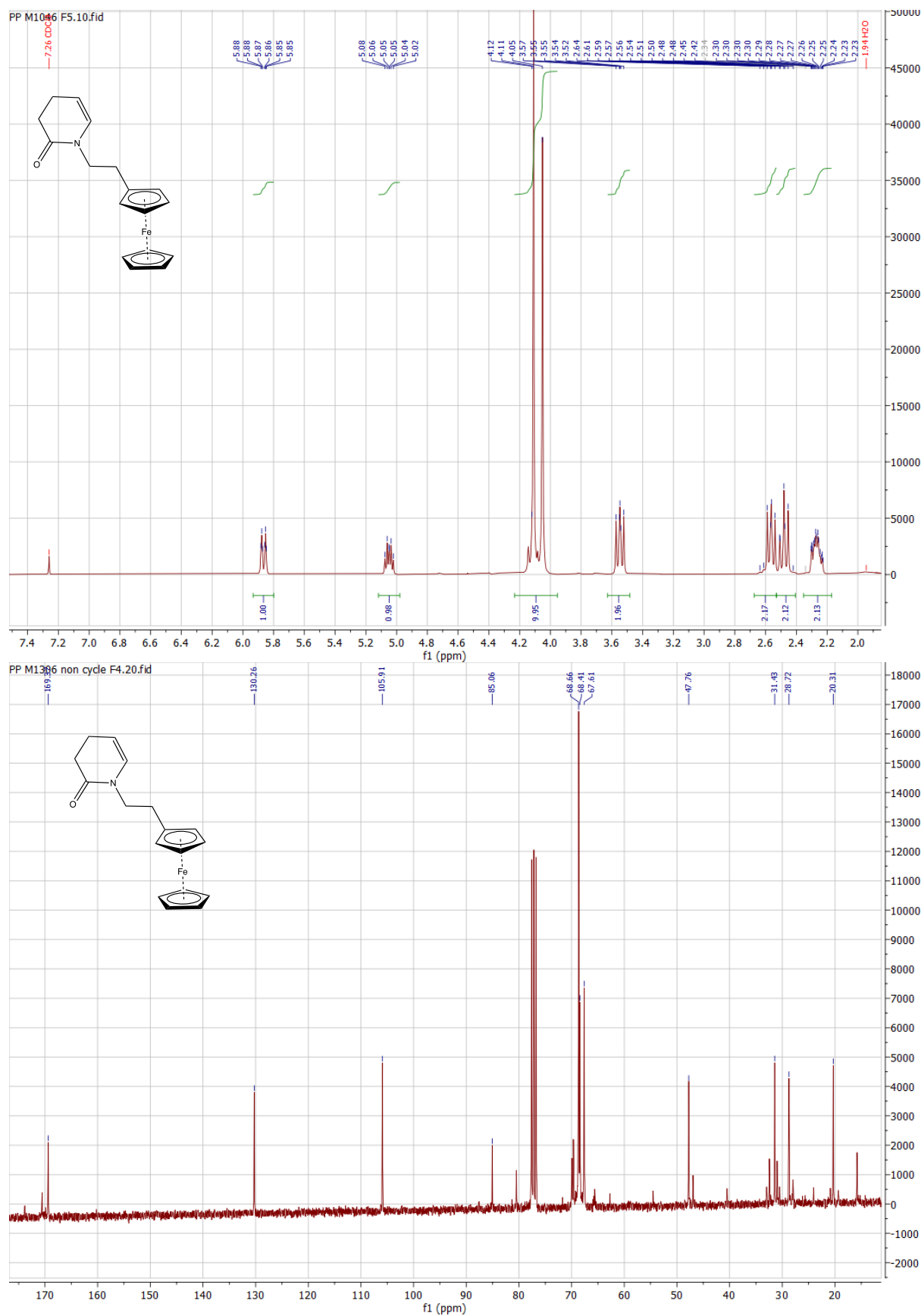
PP M1046 F9.10.fid

Chemical structure: OC(=O)CCCCNCc1ccc2c(c1)[Fe]3C=CC=CC=3C2

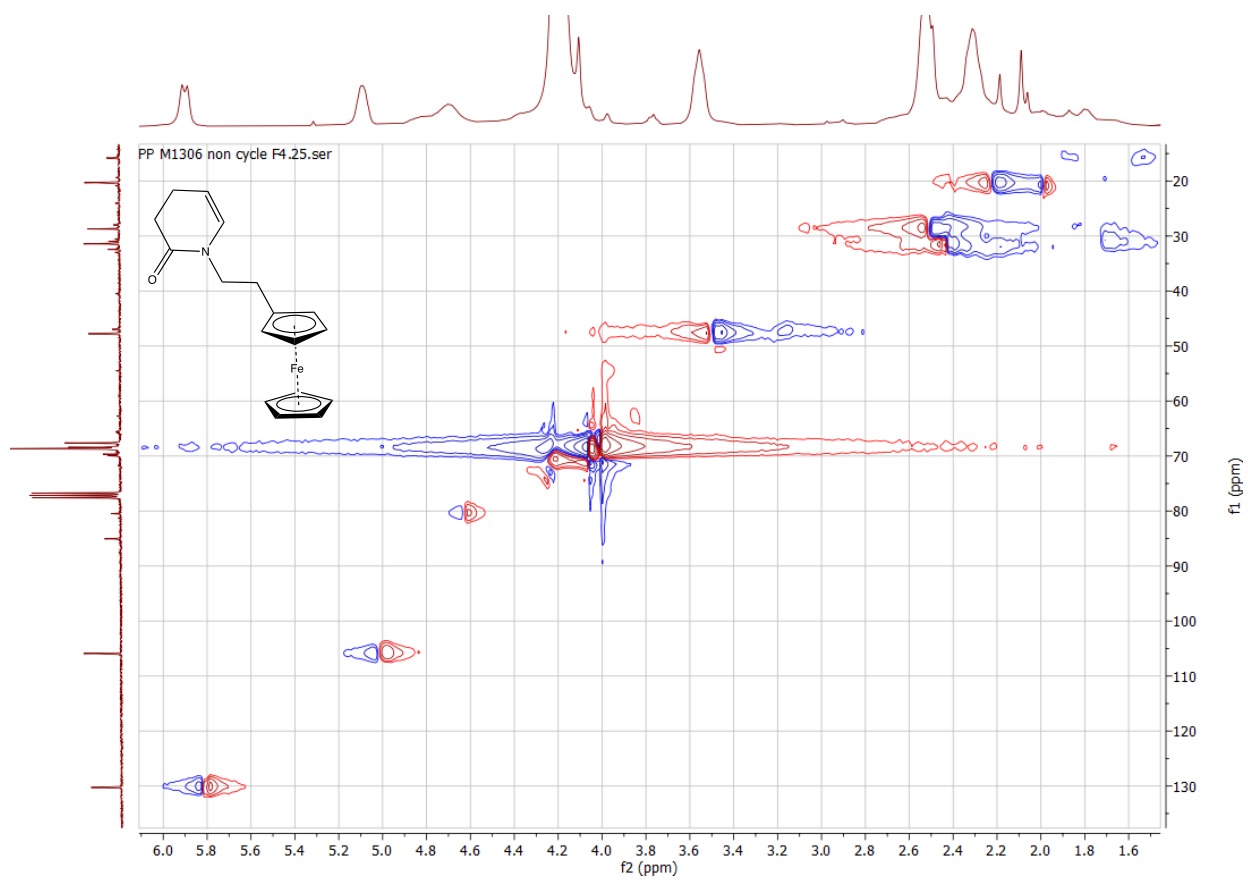
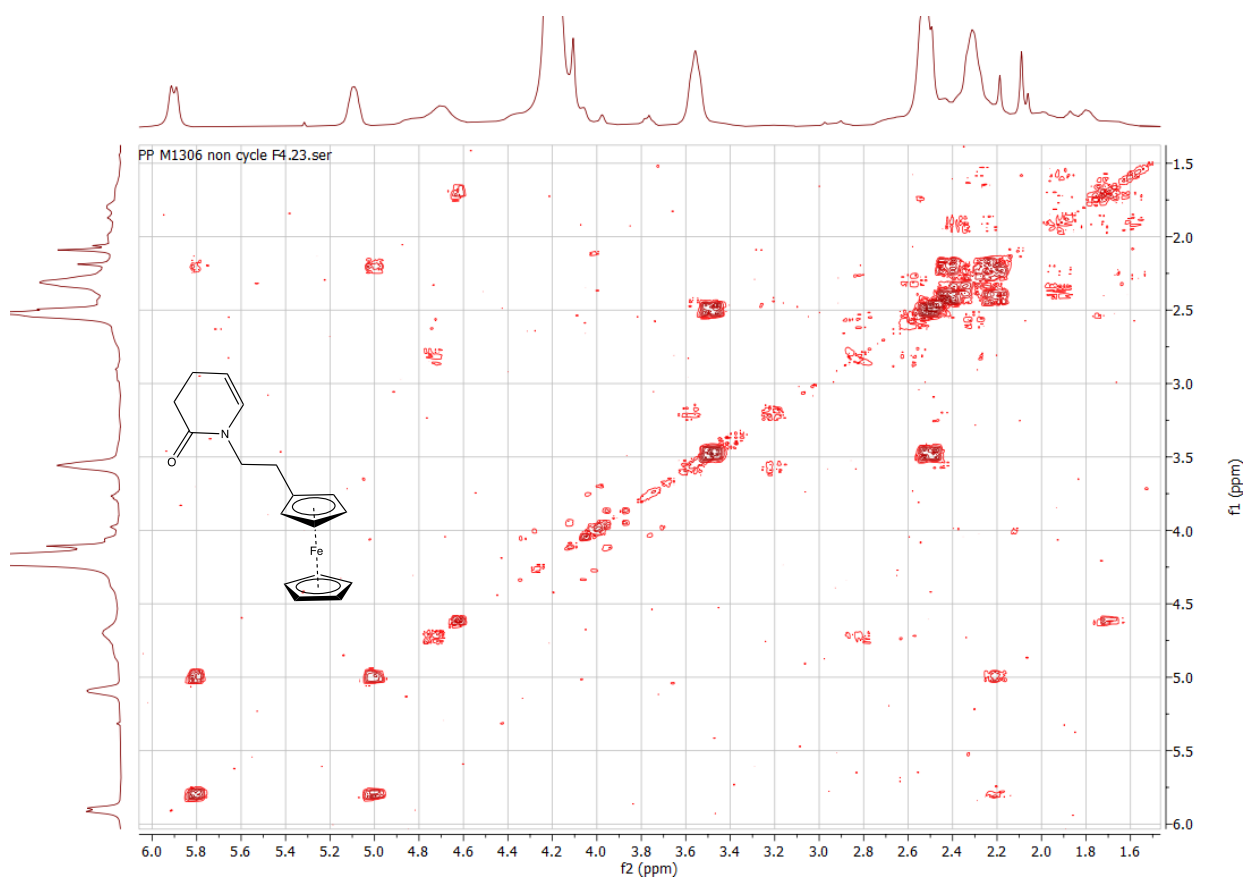
<sup>13</sup>C NMR spectrum (CDCl<sub>3</sub>) showing peaks from 20 to 175 ppm. Key features include a sharp peak at 173.20 ppm (C=O), a cluster of peaks between 70 and 80 ppm (CDCl<sub>3</sub> solvent), and several peaks in the aliphatic region (40-60 ppm). Peak labels include 173.20, 85.73, 77.58 CDCl<sub>3</sub>, 77.26 CDCl<sub>3</sub>, 76.74 CDCl<sub>3</sub>, 68.97, 68.54, 67.91, 62.14, 40.71, 36.20, 32.10, 29.80, and 21.78.

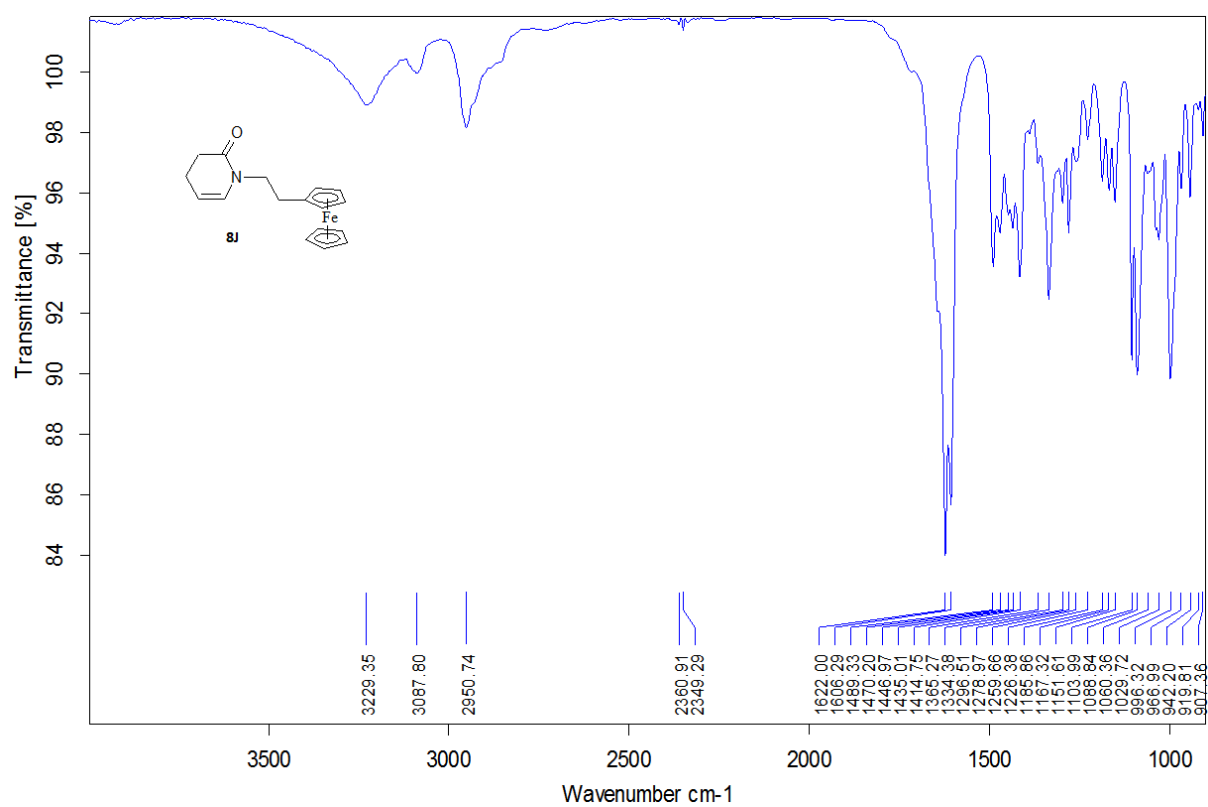


**Figure S29:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ), COSY (in  $\text{CDCl}_3$ ), HMQC (in  $\text{CDCl}_3$ ) NMR and IR data for compound **8j**

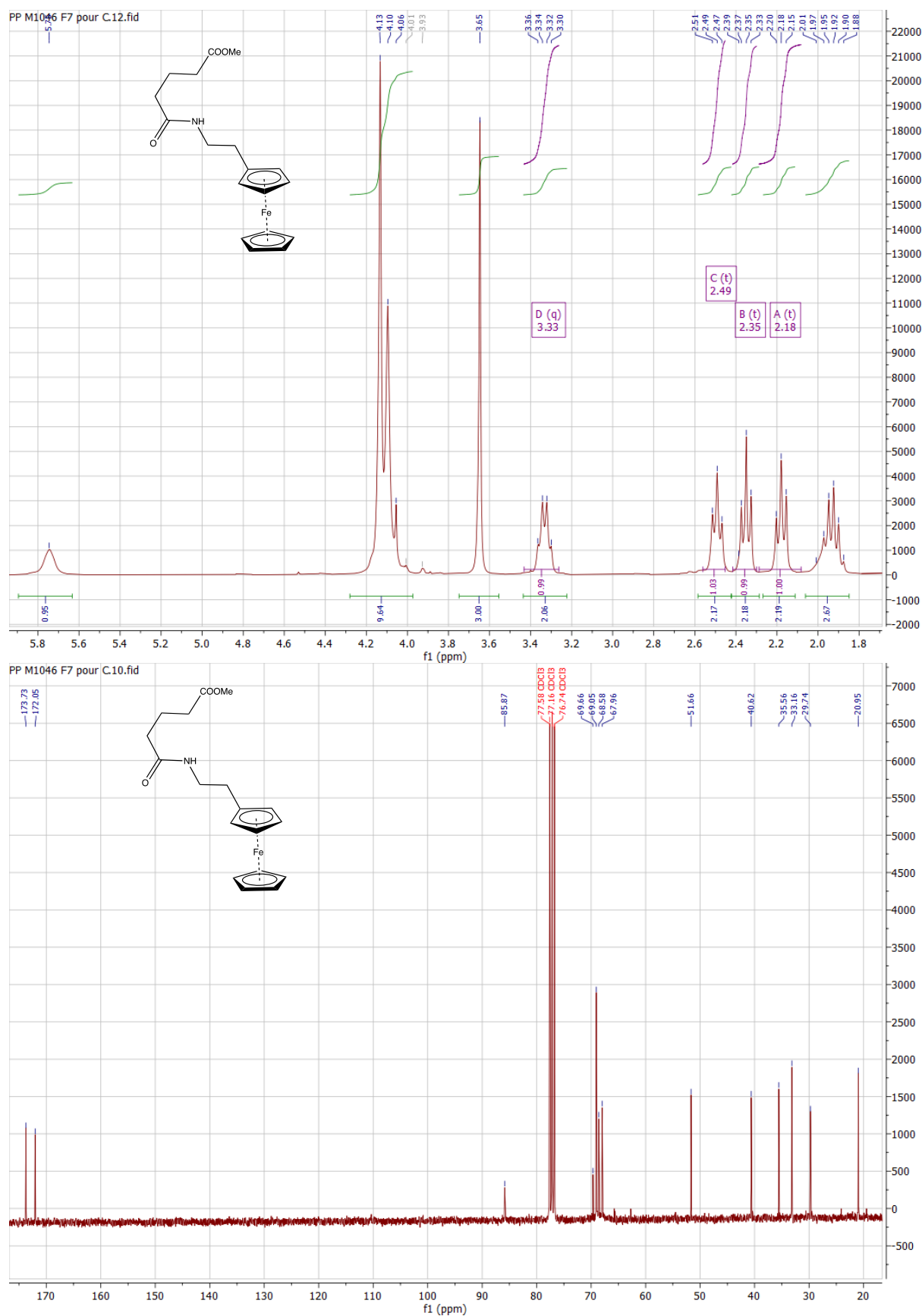


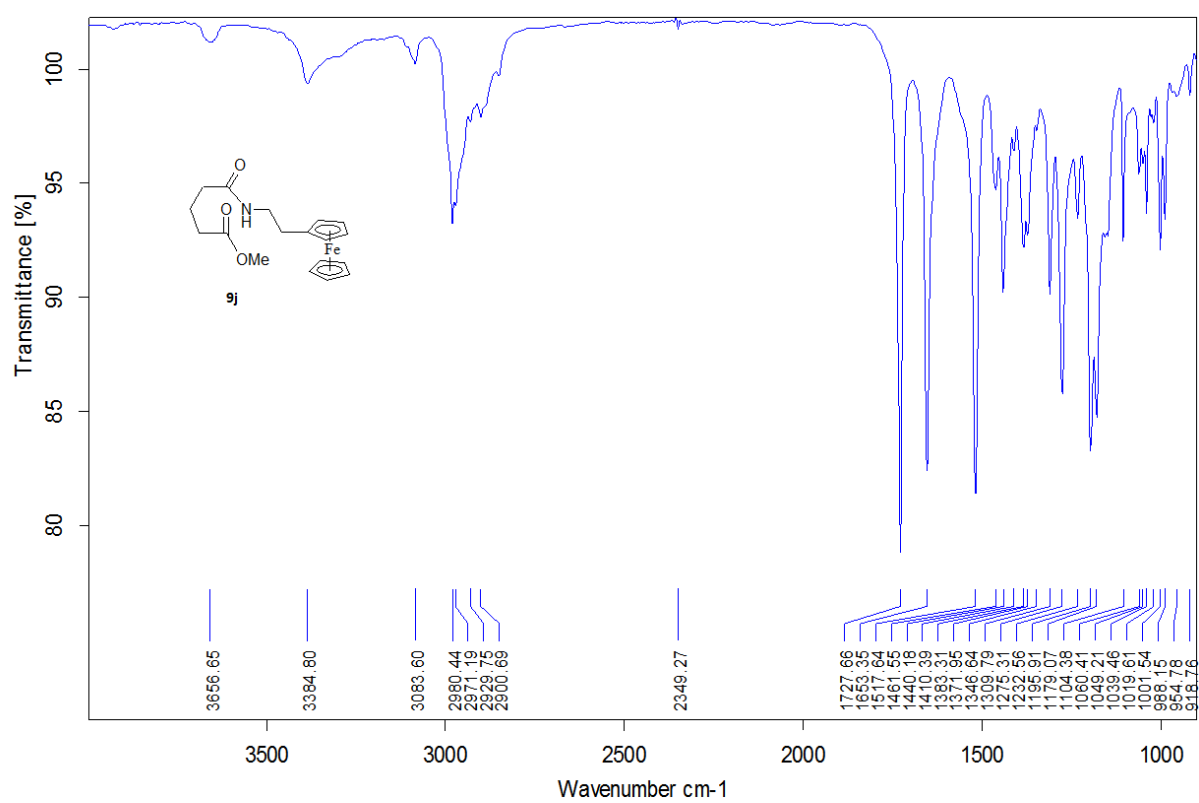




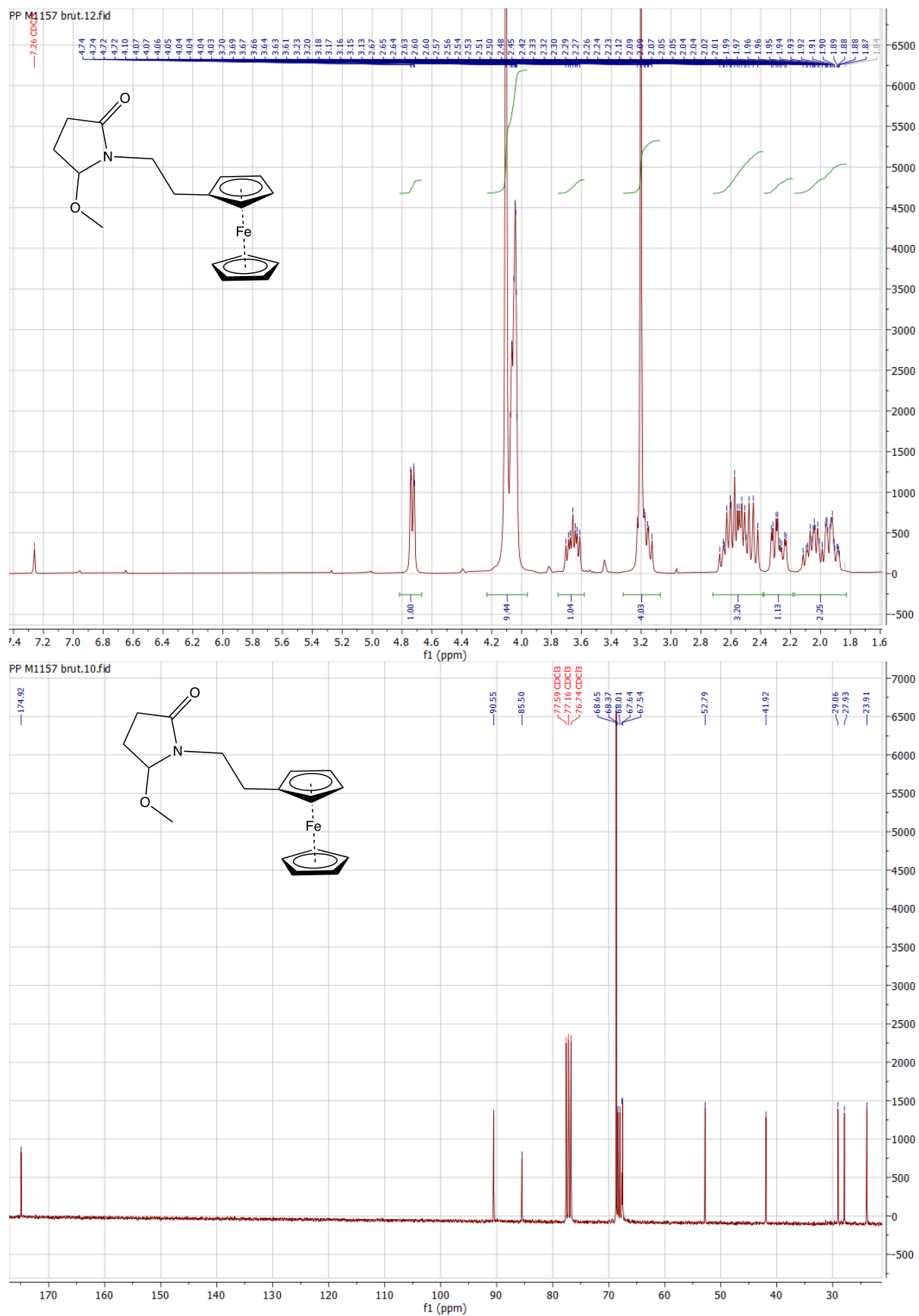


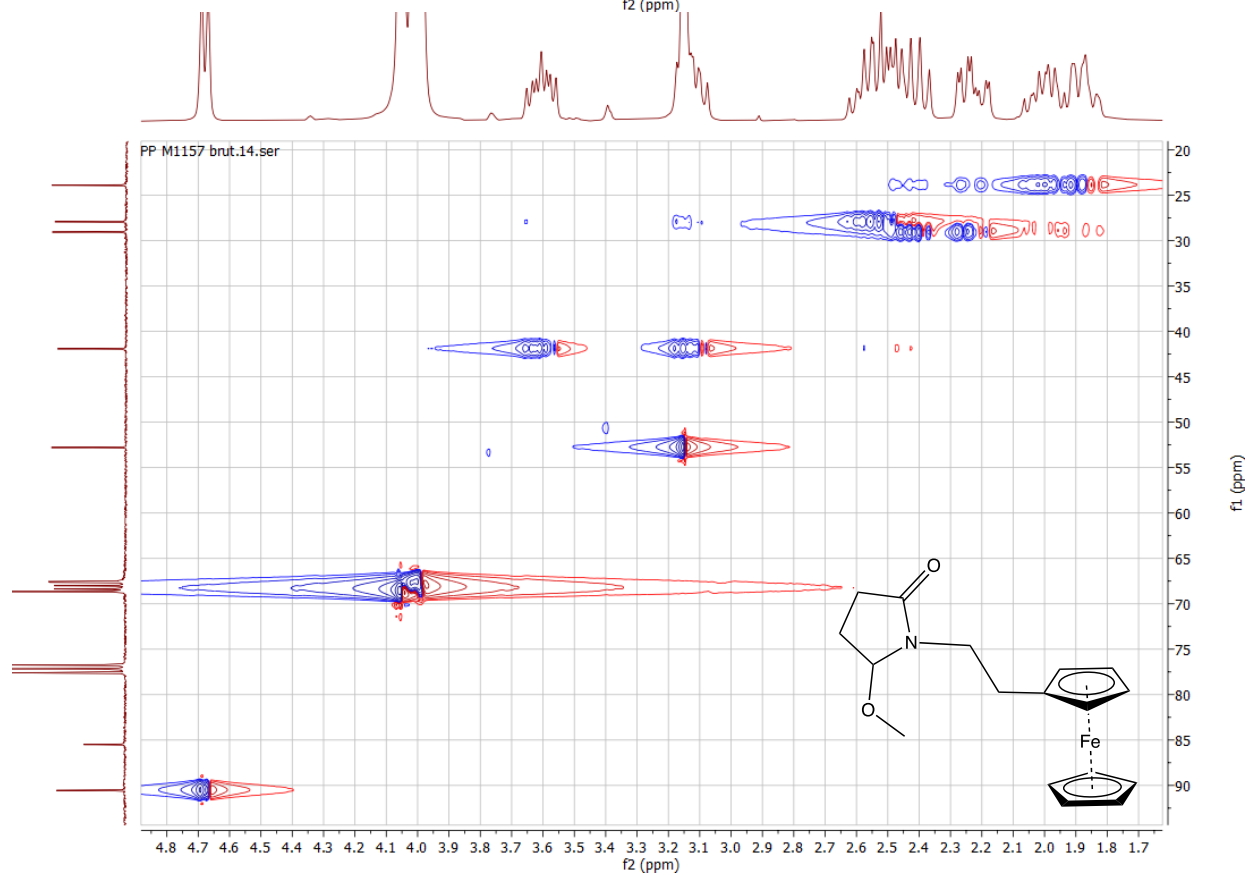
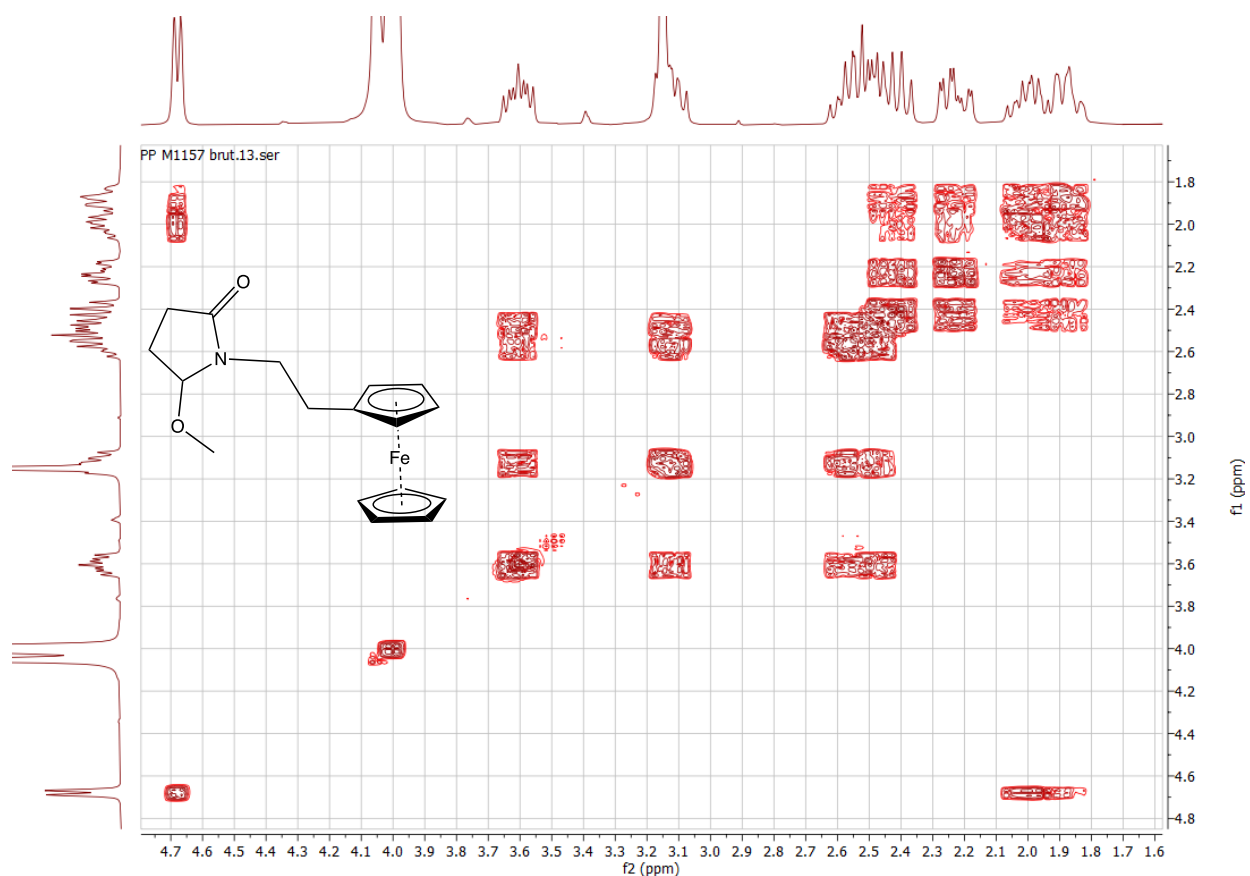
**Figure S30:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR and IR data for compound **9j**

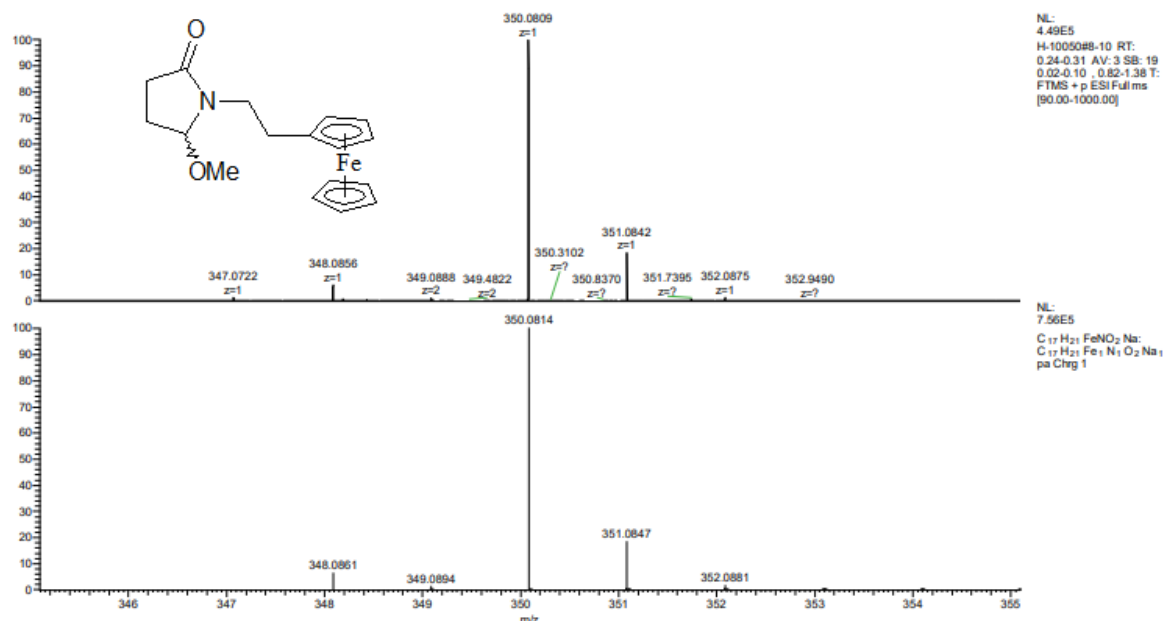




**Figure S31:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ), COSY (in  $\text{CDCl}_3$ ), HMQC (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **10b**



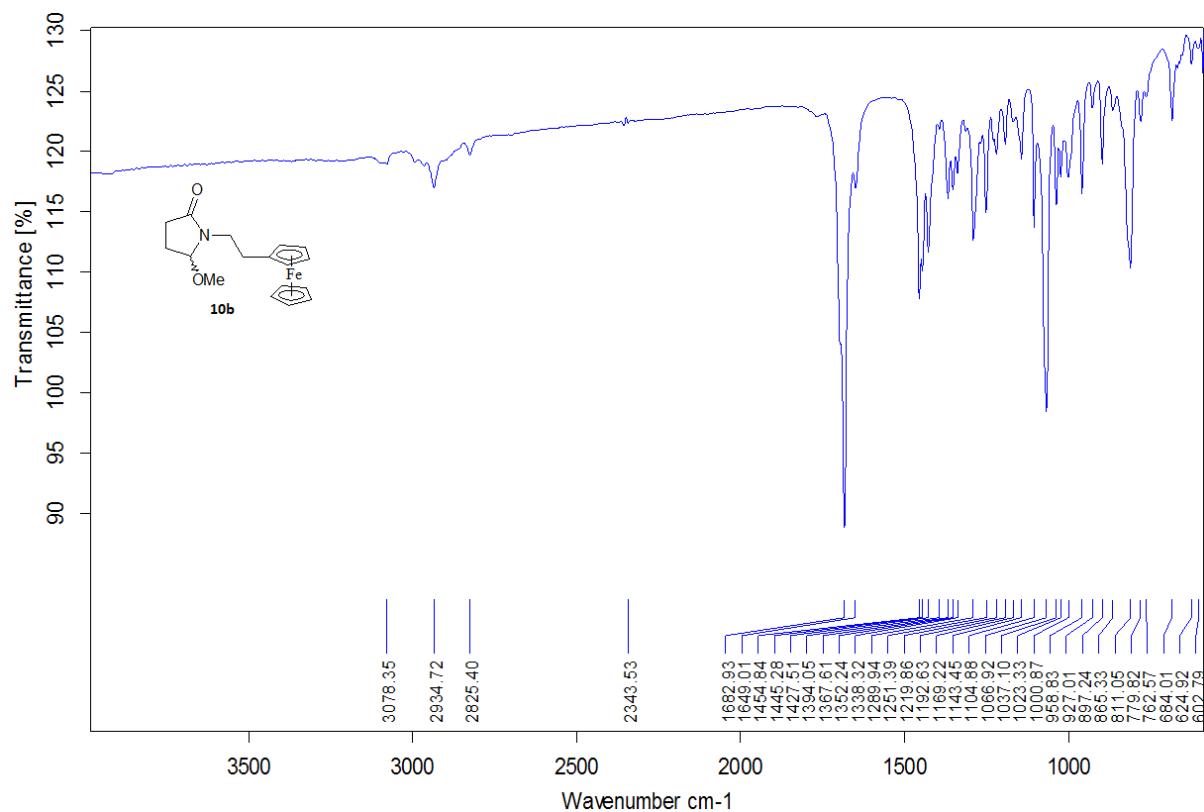




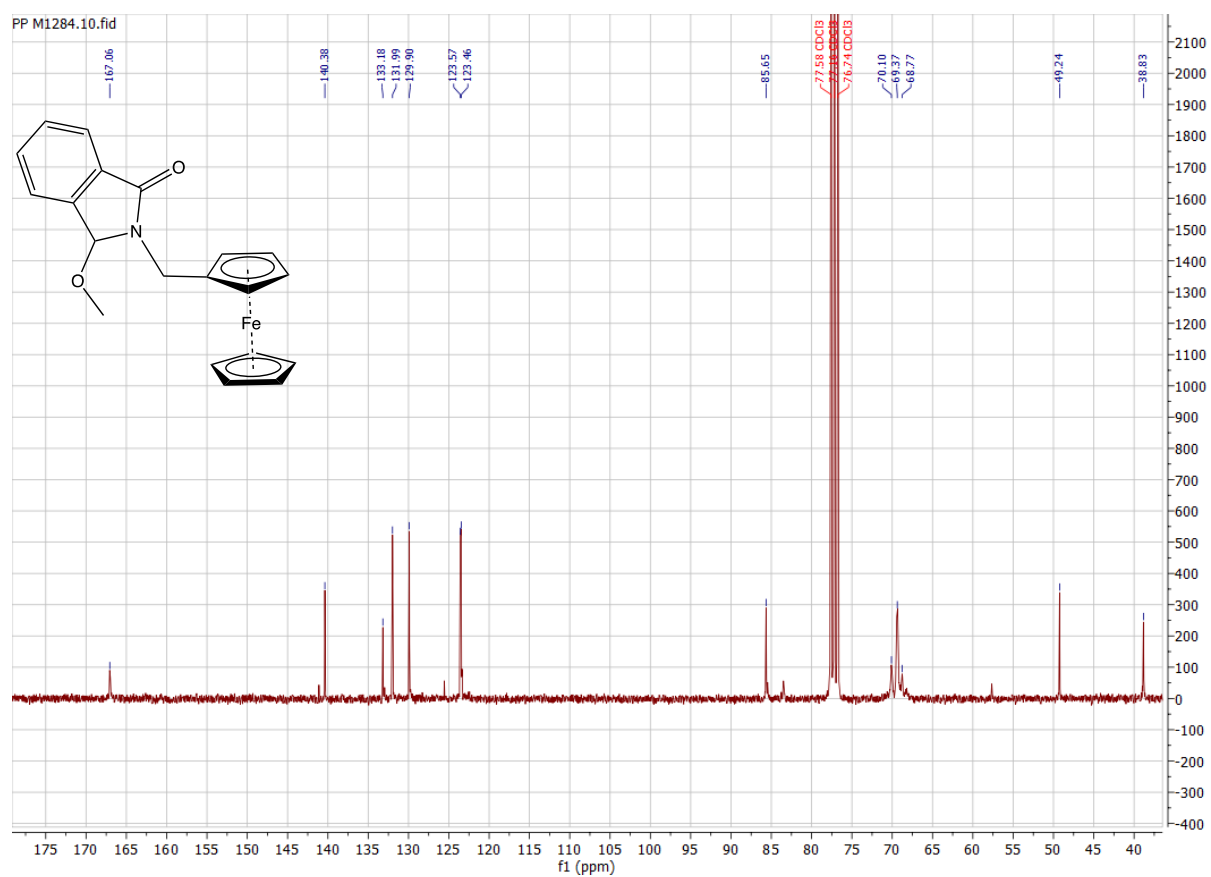
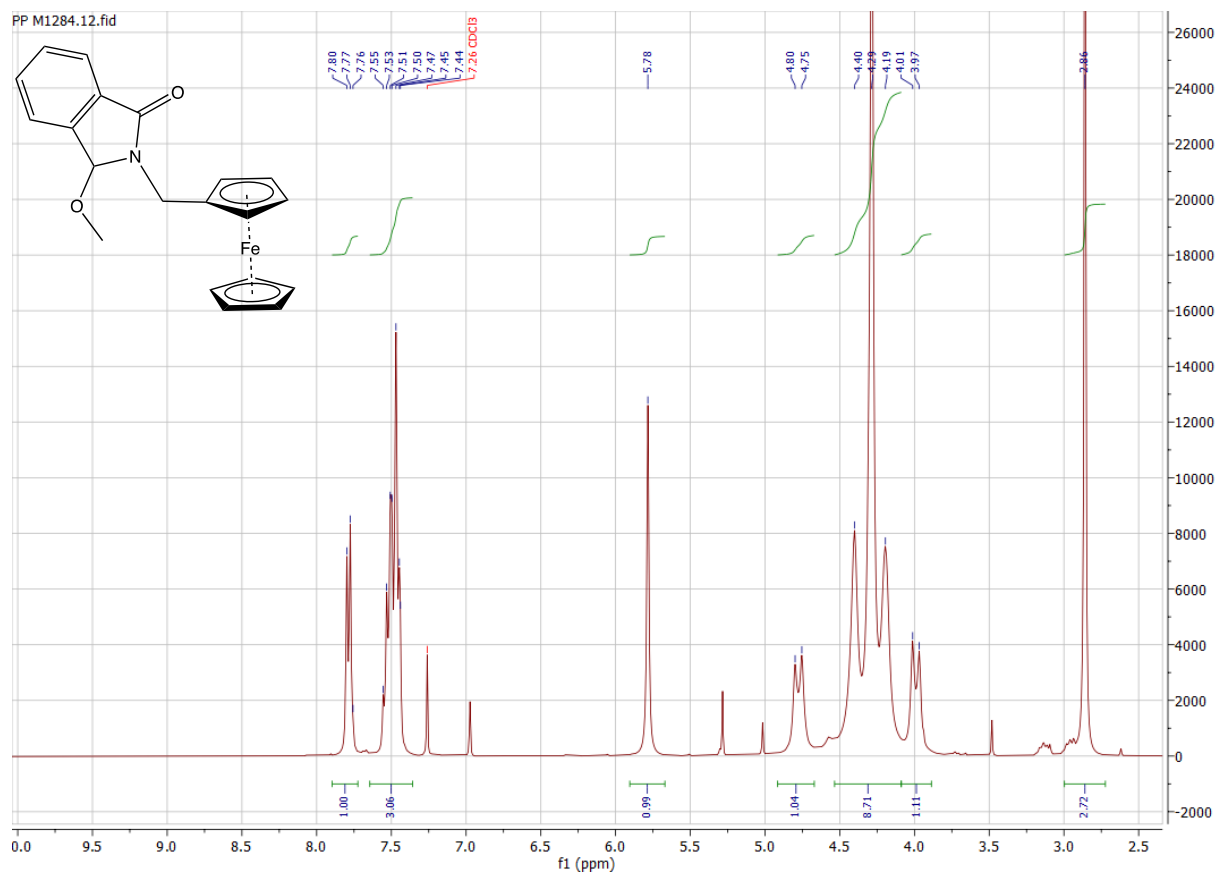
## Experimental/theoretical isotopic pattern MS spectrum

Error = -1.4 ppm; Relative Intensity (%) 100

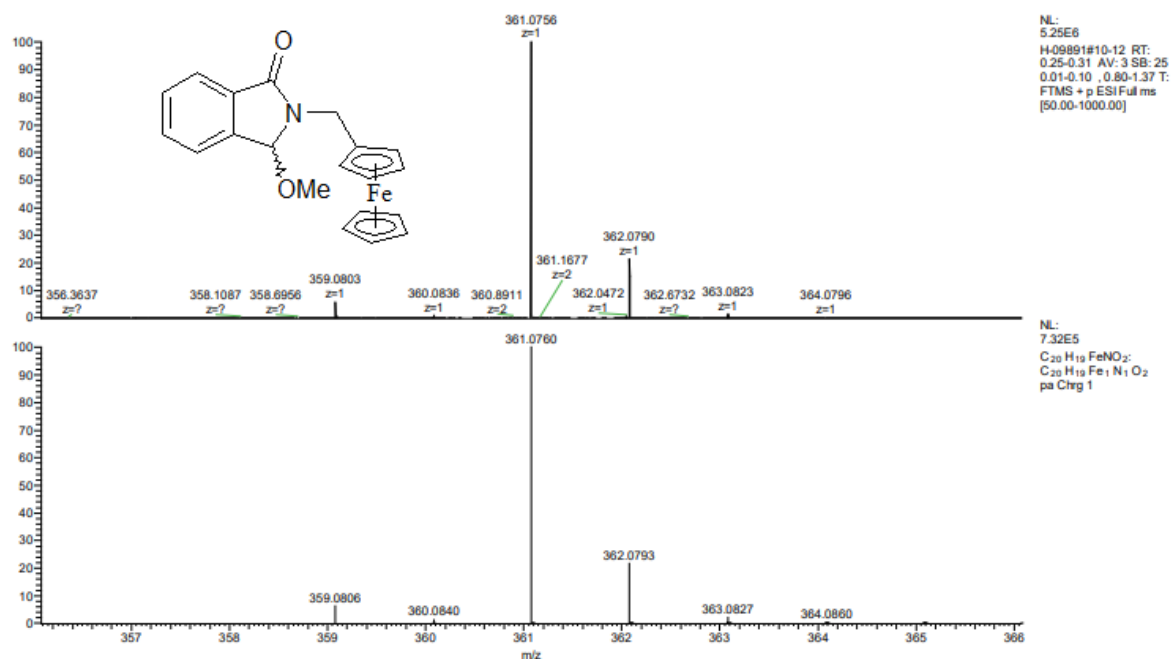
HRMS (ESI) m/z: [M+Na]<sup>+</sup> Calcd for C<sub>17</sub>H<sub>21</sub>FeNO<sub>2</sub>Na 350.0814. Found 350.0809; (Error: -1.4 ppm).



**Figure S32:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound 10e



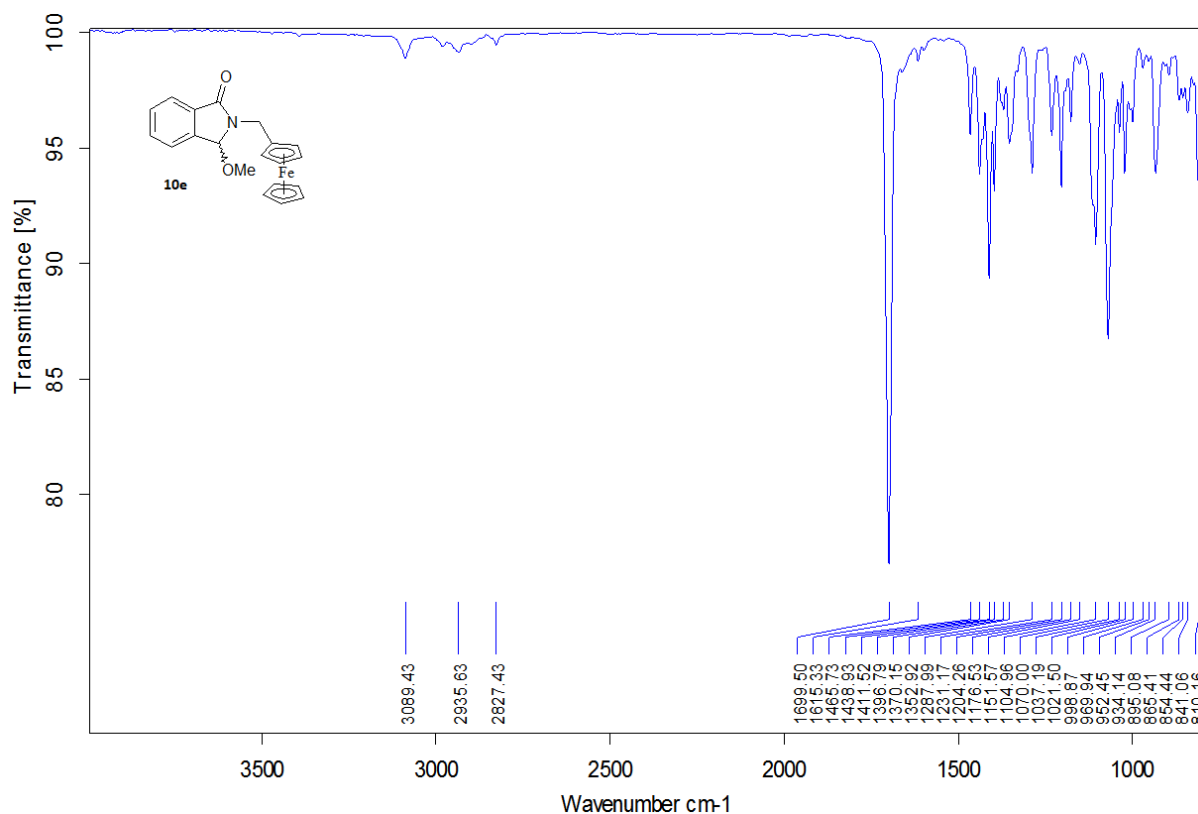




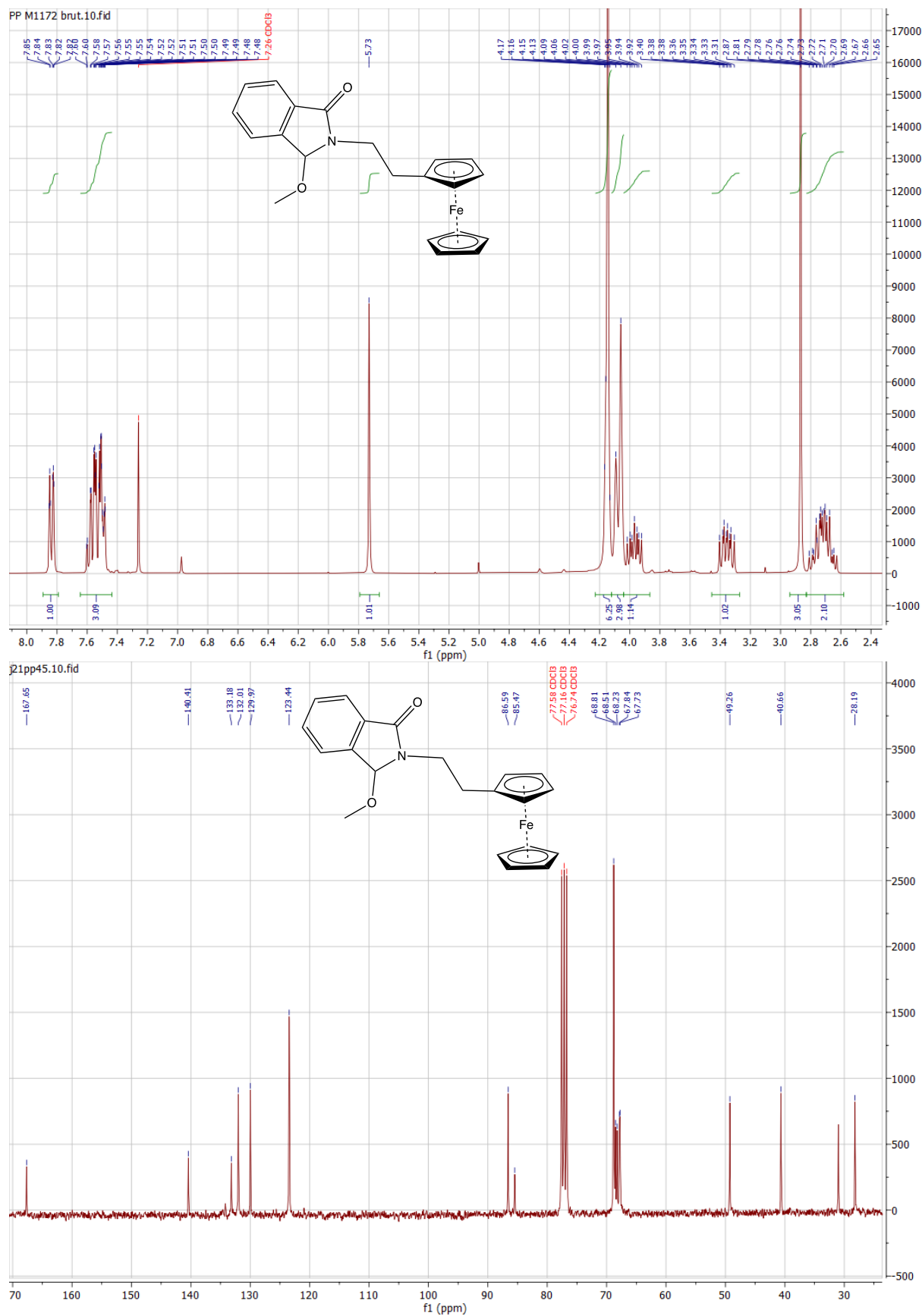
## Experimental/theoretical isotopic pattern MS spectrum

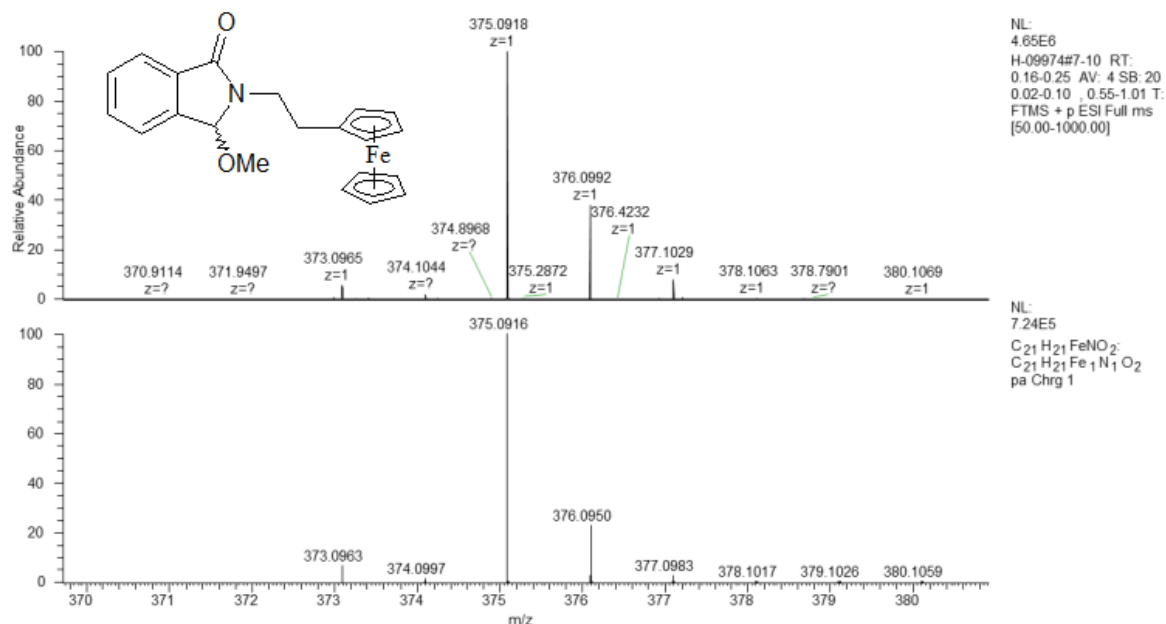
Error = -1.0 ppm; Relative Intensity (%) 100

HRMS (ESI) m/z: [M]<sup>+</sup> Calcd for C<sub>20</sub>H<sub>19</sub>FeNO<sub>2</sub> 361.0760 . Found 361.0756; (Error: -1.0 ppm).



**Figure S33:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound 10f

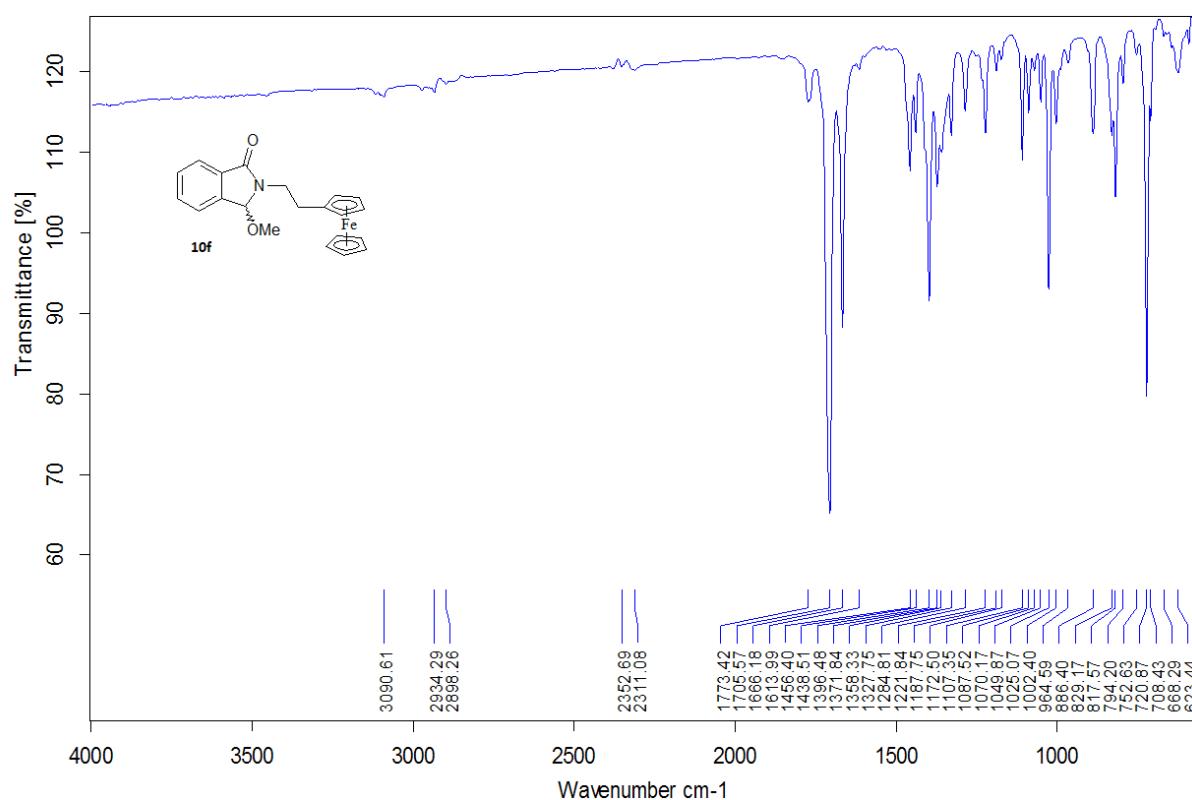




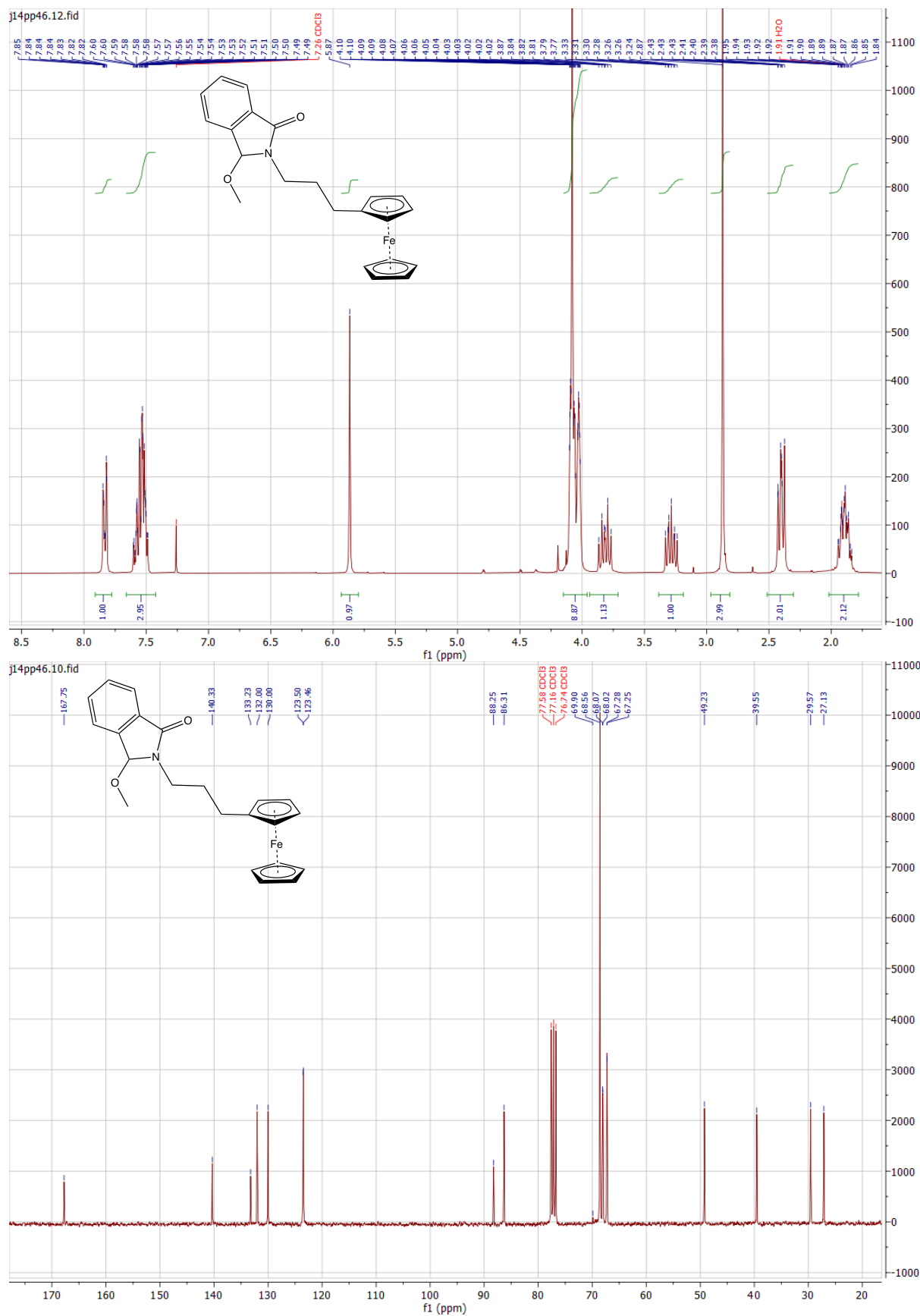
## Experimental/theoretical isotopic pattern MS spectrum

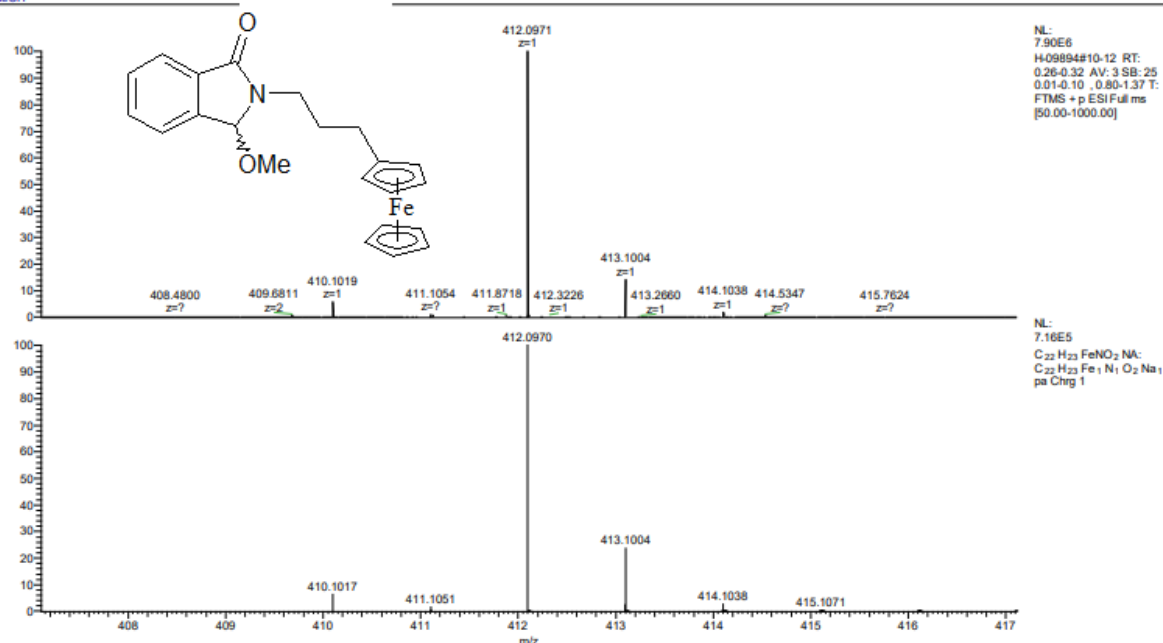
Error = 0.2 ppm; Relative Intensity (%) 100

HRMS (ESI) m/z: [M+H]<sup>+</sup> Calcd for C<sub>21</sub>H<sub>21</sub>FeNO<sub>2</sub>H 376.0994. Found 376.0995; (Error: 0.2 ppm).



**Figure S34:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **10g**

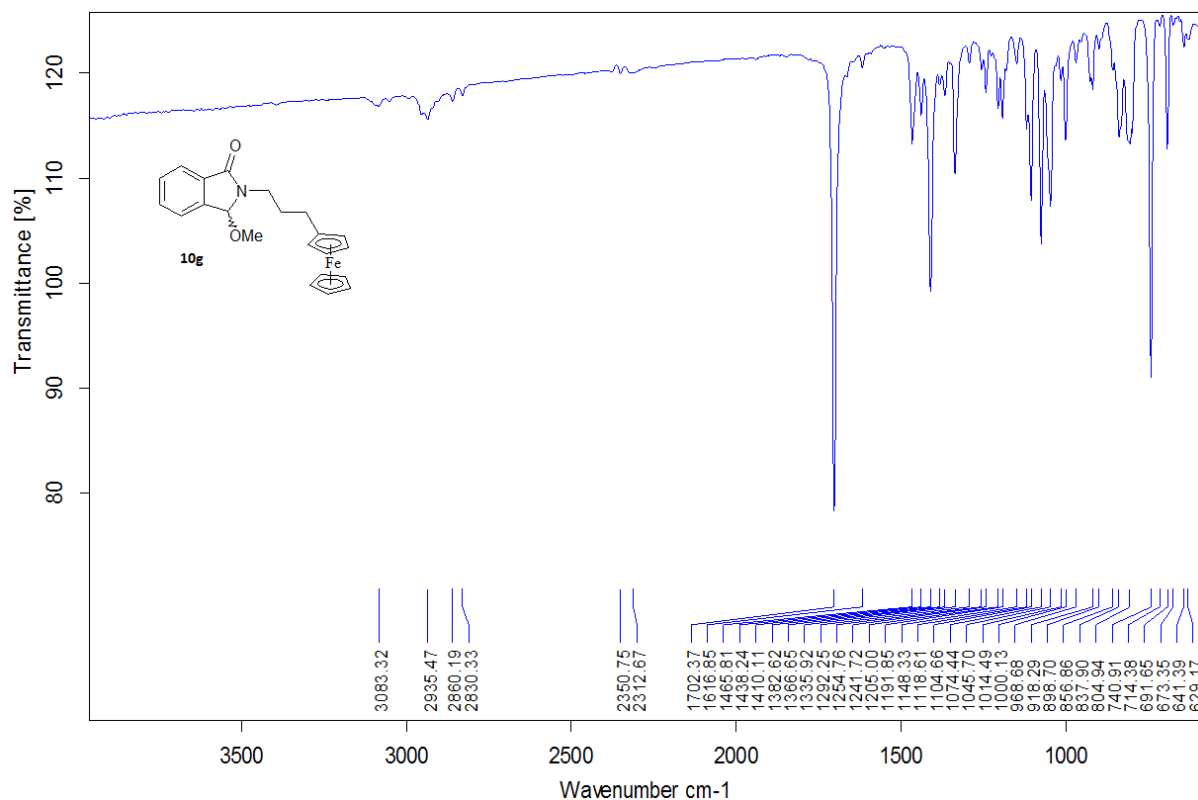




## Experimental/theoretical isotopic pattern MS spectrum

Error = 0.2 ppm; Relative Intensity (%) 100

HRMS (ESI) m/z: [M]<sup>+</sup> Calcd for C<sub>22</sub>H<sub>23</sub>FeNO<sub>2</sub>Na 412.0970 . Found 412.0971; (Error: 0.2 ppm).



**1H NMR spectrum of compound 1 in CDCl<sub>3</sub>.**

**Chemical structure of compound 1:** COc1ccc(cc1)CCCN2C(=O)c3ccccc3N2C(=O)OCC4=CC=CC=C4[Fe]5C=CC=CC=C5

**1H NMR spectrum (CDCl<sub>3</sub>) data:**

Chemical Shift (ppm)	Integration
7.84, 7.83, 7.82, 7.81, 7.61, 7.60, 7.59, 7.58, 7.57, 7.56, 7.55, 7.54, 7.53, 7.52, 7.51, 7.50, 7.49, 7.48, 7.47, 7.46, 7.45, 7.44, 7.43, 7.42, 7.41, 7.40, 7.39, 7.38, 7.37, 7.36, 7.35, 7.34, 7.33, 7.32, 7.31, 7.30, 7.29, 7.28, 7.27, 7.26, 7.25, 7.24, 7.23, 7.22, 7.21, 7.20, 7.19, 7.18, 7.17, 7.16, 7.15, 7.14, 7.13, 7.12, 7.11, 7.10, 7.09, 7.08, 7.07, 7.06, 7.05, 7.04, 7.03, 7.02, 7.01, 7.00, 6.99, 6.98, 6.97, 6.96, 6.95, 6.94, 6.93, 6.92, 6.91, 6.90, 6.89, 6.88, 6.87, 6.86, 6.85, 6.84, 6.83, 6.82, 6.81, 6.80, 6.79, 6.78, 6.77, 6.76, 6.75, 6.74, 6.73, 6.72, 6.71, 6.70, 6.69, 6.68, 6.67, 6.66, 6.65, 6.64, 6.63, 6.62, 6.61, 6.60, 6.59, 6.58, 6.57, 6.56, 6.55, 6.54, 6.53, 6.52, 6.51, 6.50, 6.49, 6.48, 6.47, 6.46, 6.45, 6.44, 6.43, 6.42, 6.41, 6.40, 6.39, 6.38, 6.37, 6.36, 6.35, 6.34, 6.33, 6.32, 6.31, 6.30, 6.29, 6.28, 6.27, 6.26, 6.25, 6.24, 6.23, 6.22, 6.21, 6.20, 6.19, 6.18, 6.17, 6.16, 6.15, 6.14, 6.13, 6.12, 6.11, 6.10, 6.09, 6.08, 6.07, 6.06, 6.05, 6.04, 6.03, 6.02, 6.01, 6.00, 5.99, 5.98, 5.97, 5.96, 5.95, 5.94, 5.93, 5.92, 5.91, 5.90, 5.89, 5.88, 5.87, 5.86, 5.85, 5.84, 5.83, 5.82, 5.81, 5.80, 5.79, 5.78, 5.77, 5.76, 5.75, 5.74, 5.73, 5.72, 5.71, 5.70, 5.69, 5.68, 5.67, 5.66, 5.65, 5.64, 5.63, 5.62, 5.61, 5.60, 5.59, 5.58, 5.57, 5.56, 5.55, 5.54, 5.53, 5.52, 5.51, 5.50, 5.49, 5.48, 5.47, 5.46, 5.45, 5.44, 5.43, 5.42, 5.41, 5.40, 5.39, 5.38, 5.37, 5.36, 5.35, 5.34, 5.33, 5.32, 5.31, 5.30, 5.29, 5.28, 5.27, 5.26, 5.25, 5.24, 5.23, 5.22, 5.21, 5.20, 5.19, 5.18, 5.17, 5.16, 5.15, 5.14, 5.13, 5.12, 5.11, 5.10, 5.09, 5.08, 5.07, 5.06, 5.05, 5.04, 5.03, 5.02, 5.01, 5.00, 4.99, 4.98, 4.97, 4.96, 4.95, 4.94, 4.93, 4.92, 4.91, 4.90, 4.89, 4.88, 4.87, 4.86, 4.85, 4.84, 4.83, 4.82, 4.81, 4.80, 4.79, 4.78, 4.77, 4.76, 4.75, 4.74, 4.73, 4.72, 4.71, 4.70, 4.69, 4.68, 4.67, 4.66, 4.65, 4.64, 4.63, 4.62, 4.61, 4.60, 4.59, 4.58, 4.57, 4.56, 4.55, 4.54, 4.53, 4.52, 4.51, 4.50, 4.49, 4.48, 4.47, 4.46, 4.45, 4.44, 4.43, 4.42, 4.41, 4.40, 4.39, 4.38, 4.37, 4.36, 4.35, 4.34, 4.33, 4.32, 4.31, 4.30, 4.29, 4.28, 4.27, 4.26, 4.25, 4.24, 4.23, 4.22, 4.21, 4.20, 4.19, 4.18, 4.17, 4.16, 4.15, 4.14, 4.13, 4.12, 4.11, 4.10, 4.09, 4.08, 4.07, 4.06, 4.05, 4.04, 4.03, 4.02, 4.01, 4.00, 3.99, 3.98, 3.97, 3.96, 3.95, 3.94, 3.93, 3.92, 3.91, 3.90, 3.89, 3.88, 3.87, 3.86, 3.85, 3.84, 3.83, 3.82, 3.81, 3.80, 3.79, 3.78, 3.77, 3.76, 3.75, 3.74, 3.73, 3.72, 3.71, 3.70, 3.69, 3.68, 3.67, 3.66, 3.65, 3.64, 3.63, 3.62, 3.61, 3.60, 3.59, 3.58, 3.57, 3.56, 3.55, 3.54, 3.53, 3.52, 3.51, 3.50, 3.49, 3.48, 3.47, 3.46, 3.45, 3.44, 3.43, 3.42, 3.41, 3.40, 3.39, 3.38, 3.37, 3.36, 3.35, 3.34, 3.33, 3.32, 3.31, 3.30, 3.29, 3.28, 3.27, 3.26, 3.25, 3.24, 3.23, 3.22, 3.21, 3.20, 3.19, 3.18, 3.17, 3.16, 3.15, 3.14, 3.13, 3.12, 3.11, 3.10, 3.09, 3.08, 3.07, 3.06, 3.05, 3.04, 3.03, 3.02, 3.01, 3.00, 2.99, 2.98, 2.97, 2.96, 2.95, 2.94, 2.93, 2.92, 2.91, 2.90, 2.89, 2.88, 2.87, 2.86, 2.85, 2.84, 2.83, 2.82, 2.81, 2.80, 2.79, 2.78, 2.77, 2.76, 2.75, 2.74, 2.73, 2.72, 2.71, 2.70, 2.69, 2.68, 2.67, 2.66, 2.65, 2.64, 2.63, 2.62, 2.61, 2.60, 2.59, 2.58, 2.57, 2.56, 2.55, 2.54, 2.53, 2.52, 2.51, 2.50, 2.49, 2.48, 2.47, 2.46, 2.45, 2.44, 2.43, 2.42, 2.41, 2.40, 2.39, 2.38, 2.37, 2.36, 2.35, 2.34, 2.33, 2.32, 2.31, 2.30, 2.29, 2.28, 2.27, 2.26, 2.25, 2.24, 2.23, 2.22, 2.21, 2.20, 2.19, 2.18, 2.17, 2.16, 2.15, 2.14, 2.13, 2.12, 2.11, 2.10, 2.09, 2.08, 2.07, 2.06, 2.05, 2.04, 2.03, 2.02, 2.01, 2.00, 1.99, 1.98, 1.97, 1.96, 1.95, 1.94, 1.93, 1.92, 1.91, 1.90, 1.89, 1.88, 1.87, 1.86, 1.85, 1.84, 1.83, 1.82, 1.81, 1.80, 1.79, 1.78, 1.77, 1.76, 1.75, 1.74, 1.73, 1.72, 1.71, 1.70, 1.69, 1.68, 1.67, 1.66, 1.65, 1.64, 1.63, 1.62, 1.61, 1.60, 1.59, 1.58, 1.57, 1.56, 1.55, 1.54, 1.53, 1.52, 1.51, 1.50, 1.49, 1.48, 1.47, 1.46, 1.45, 1.44, 1.43, 1.42, 1.41, 1.40, 1.39, 1.38, 1.37, 1.36, 1.35, 1.34, 1.33, 1.32, 1.31, 1.30, 1.29, 1.28, 1.27,	



# Single Mass Analysis

Tolerance = 5.0 PPM / DBE: min = -1.5, max = 100.0

Element prediction: Off

Number of isotope peaks used for i-FIT = 9

Monoisotopic Mass, Odd Electron Ions

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

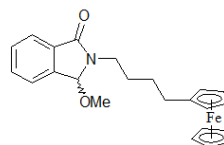
Elements Used:

C: 1-150 H: 1-150 N: 0-3 O: 0-10 Fe: 1-1

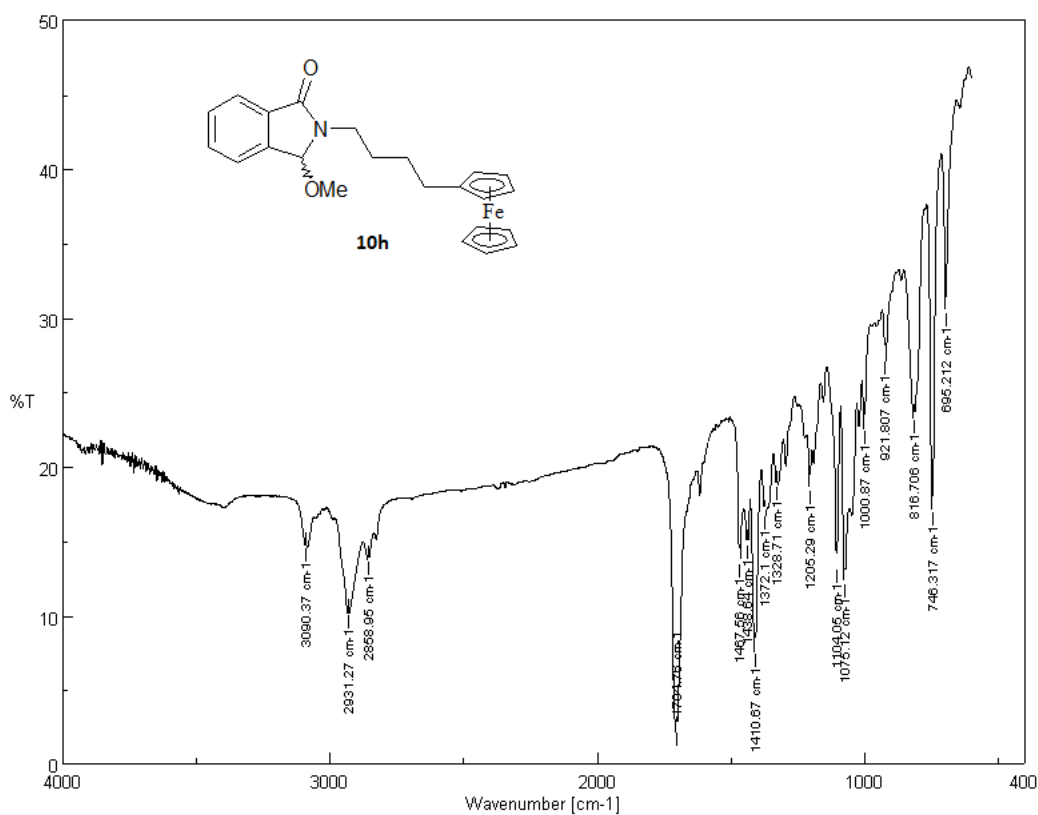
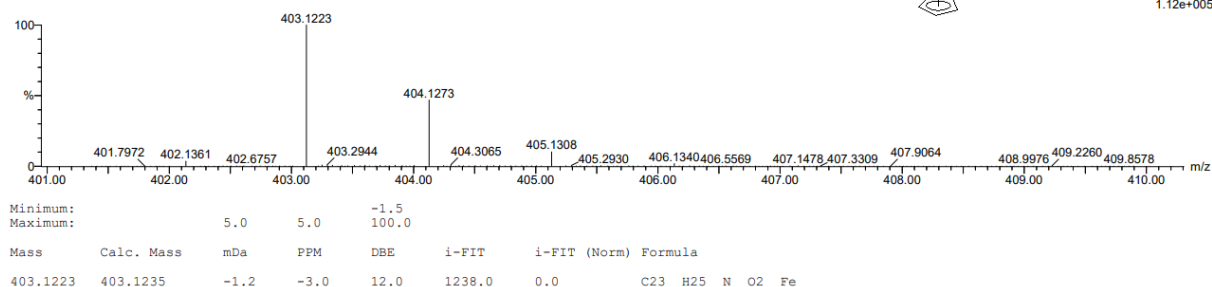
19-Jun-2013 2:11:06

ENSCP\_P715 37 (0.932) Cm (32.47)

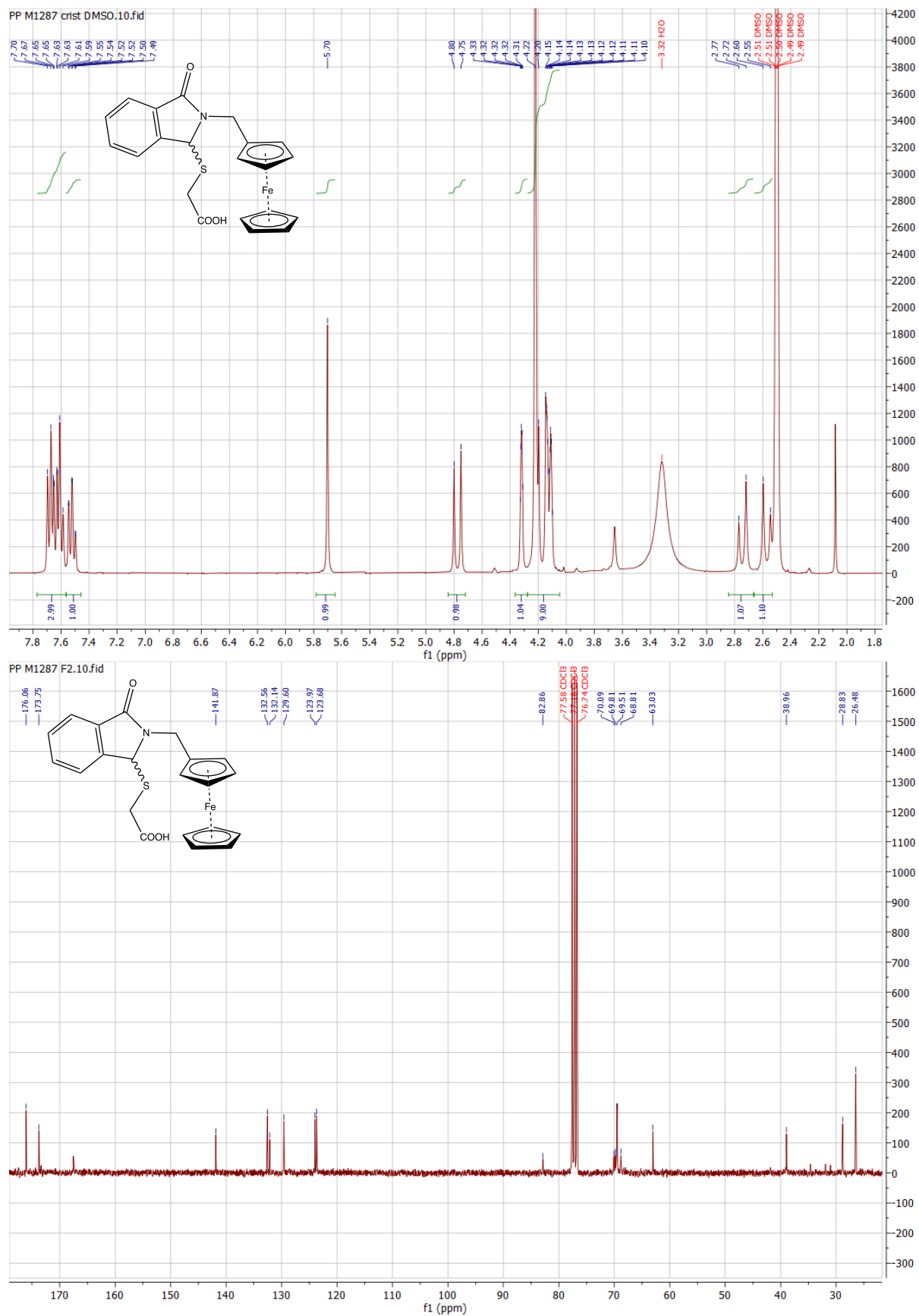
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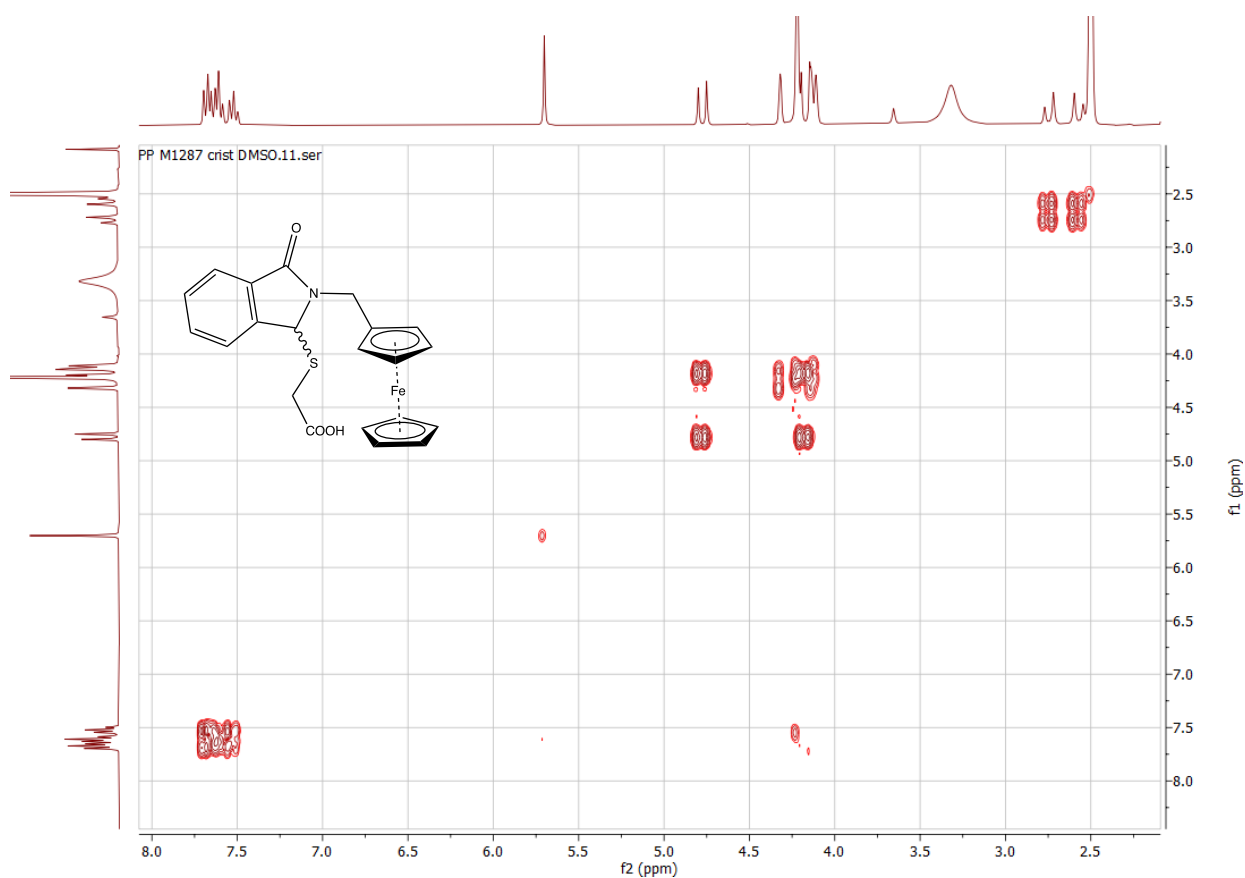
LCT Premier XE KE483  
1: TOF MS ES+  
1.12e+005



**Figure S36:**  $^1\text{H}$  (in  $\text{DMSO-d}_6$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ), COSY (in  $\text{DMSO-d}_6$ ) NMR, HR-MS and IR data for compound **11**



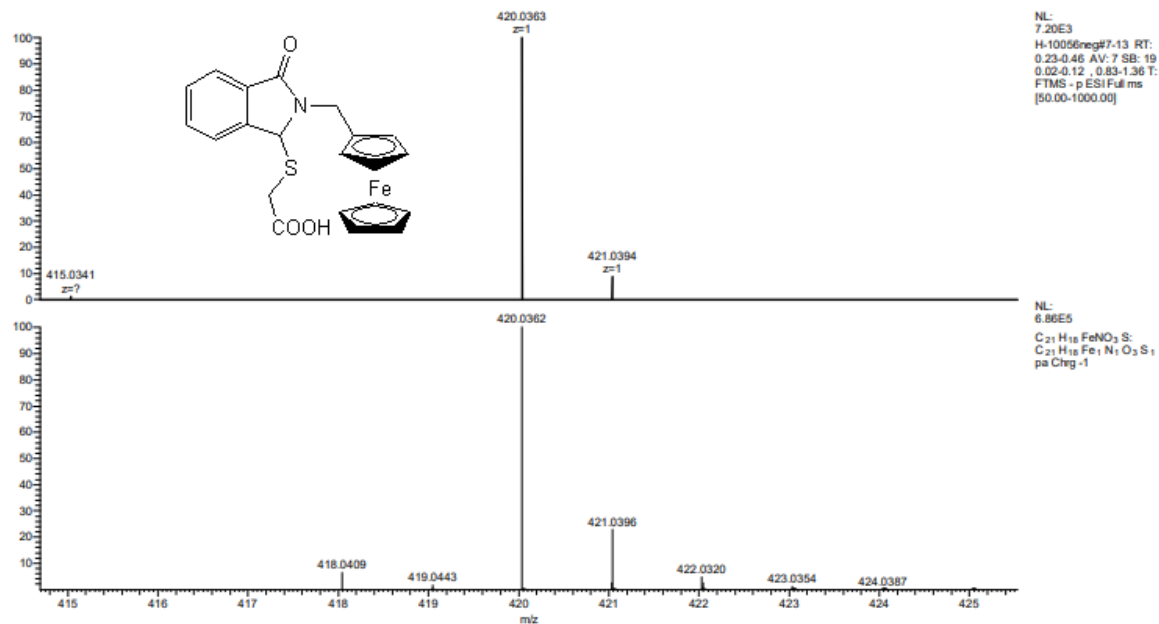




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MeCN

4/5/2022 10:50:04 AM

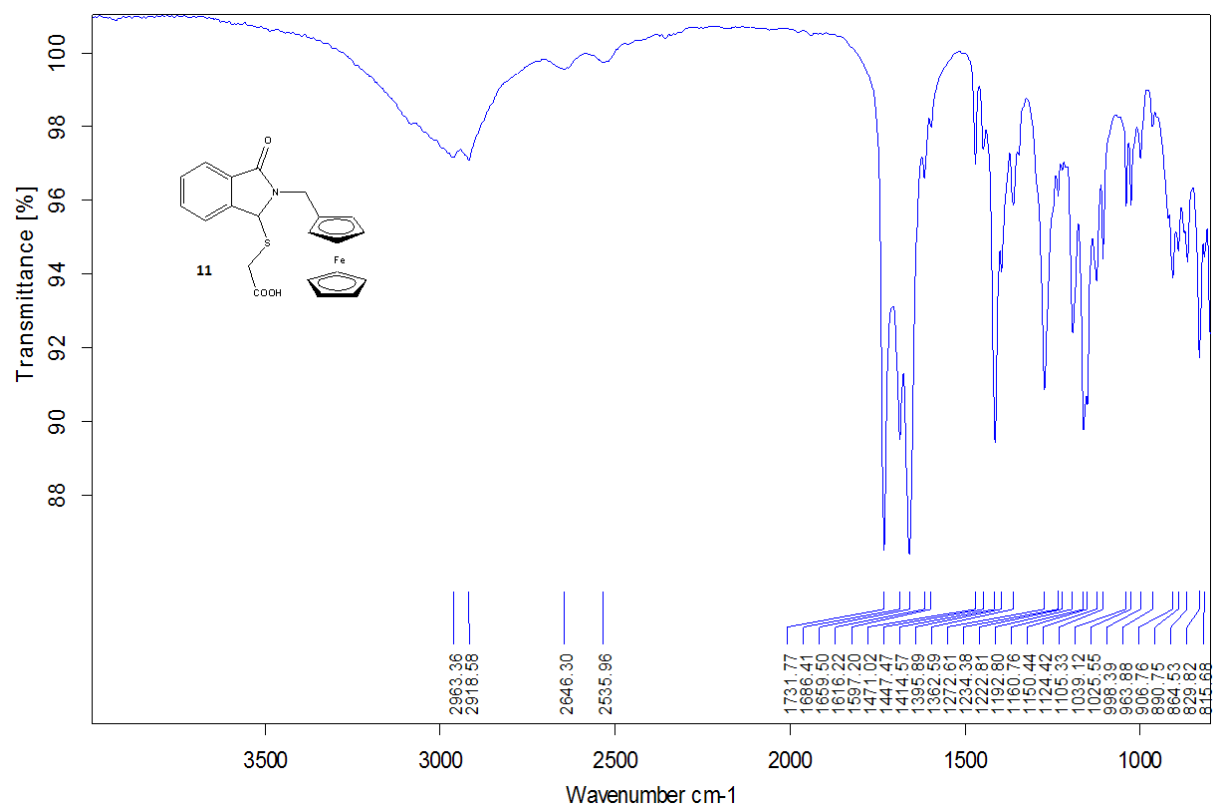
Pascal Pigeon P1015



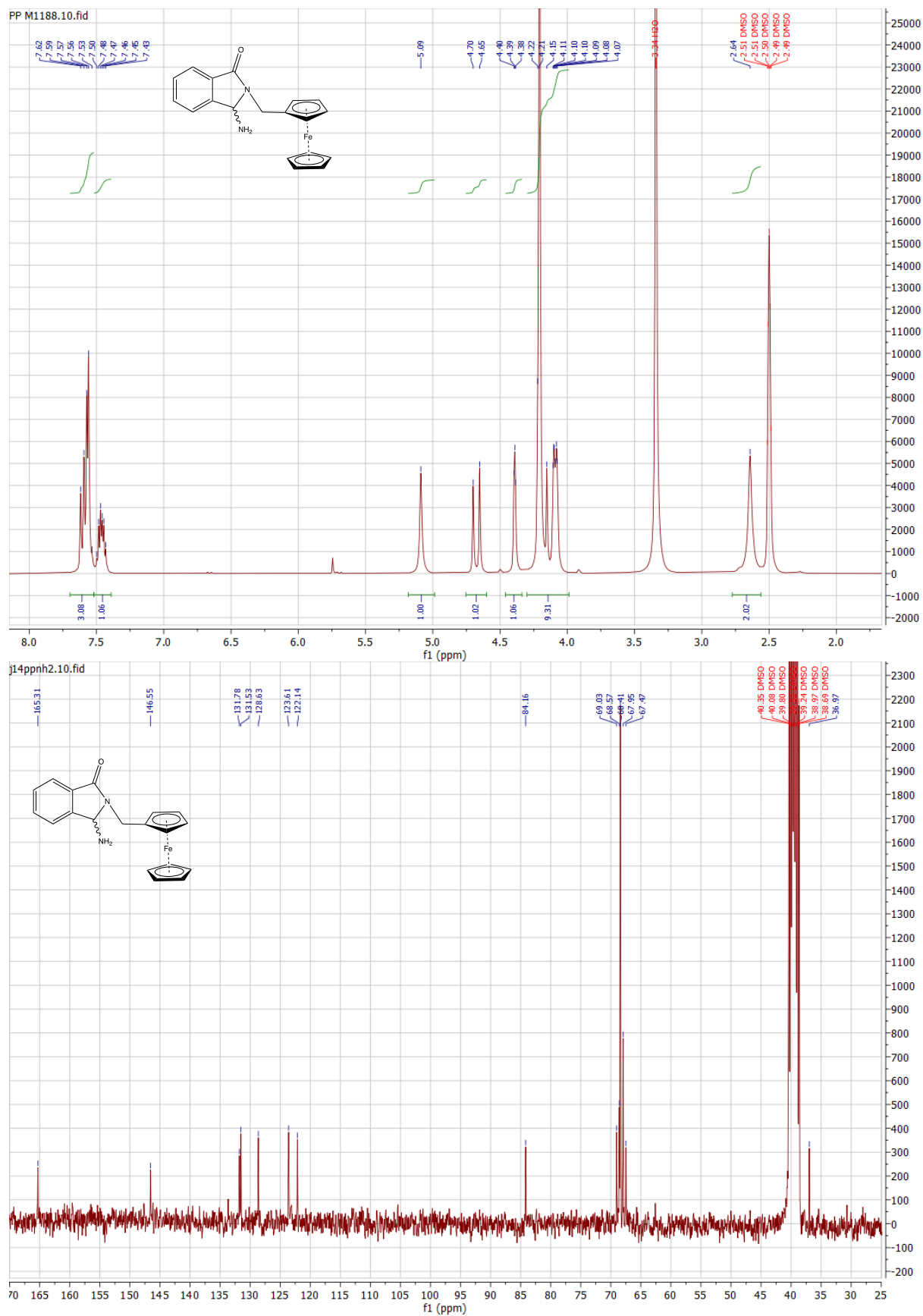
## Experimental/theoretical isotopic pattern MS spectrum

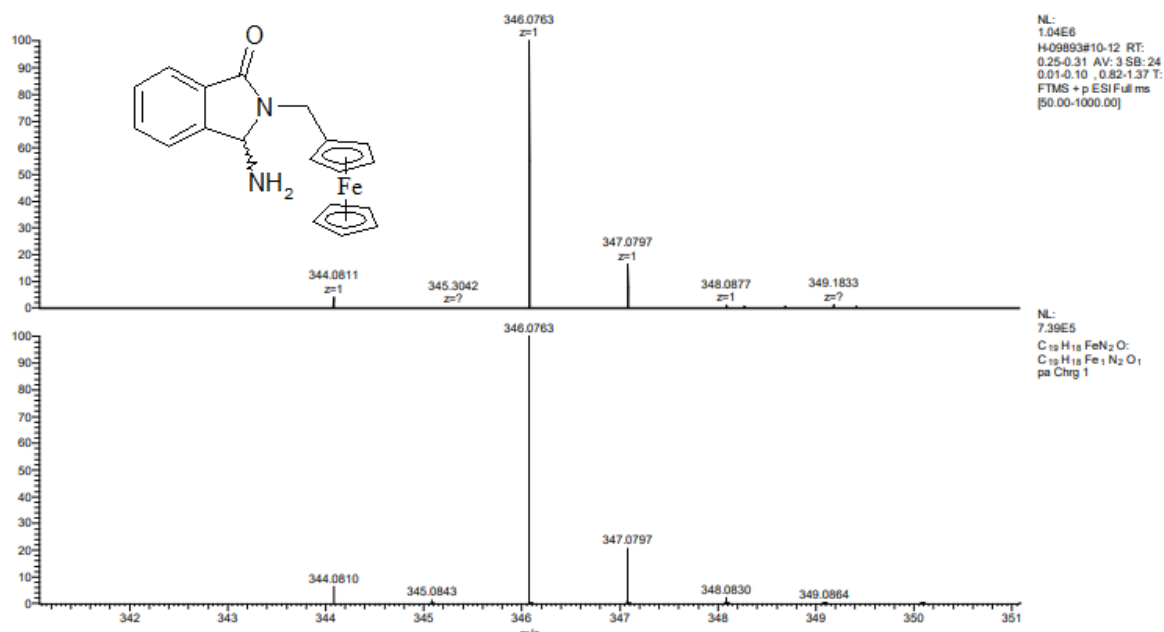
Error = 0.9 ppm; Relative Intensity (%) 100

HRMS (ESI) m/z: [M] 1- Calcd for C<sub>21</sub>H<sub>18</sub>FeNO<sub>3</sub>S 420.0362 . Found 420.0366; (Error: 0.9 ppm).



**Figure S37:**  $^1\text{H}$  (in  $\text{DMSO-d}_6$ ),  $^{13}\text{C}$  (in  $\text{DMSO-d}_6$ ) NMR, HR-MS and IR data for compound **13**

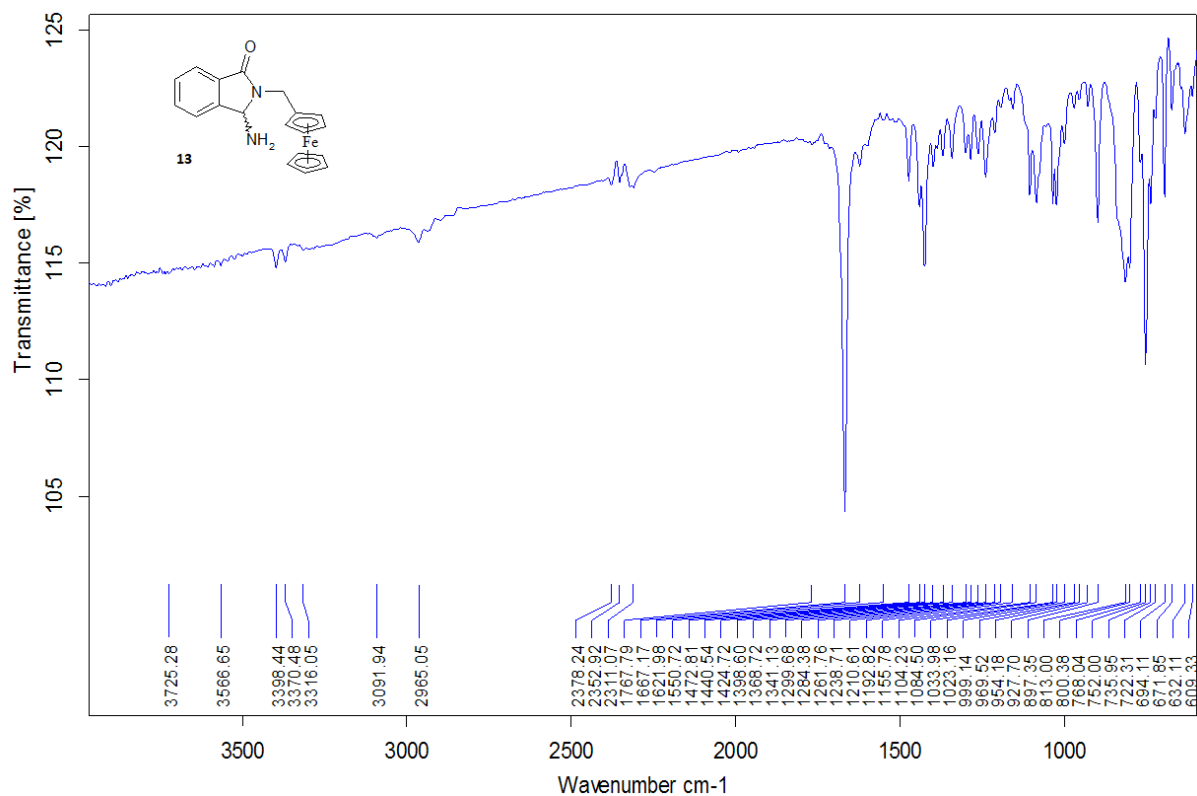




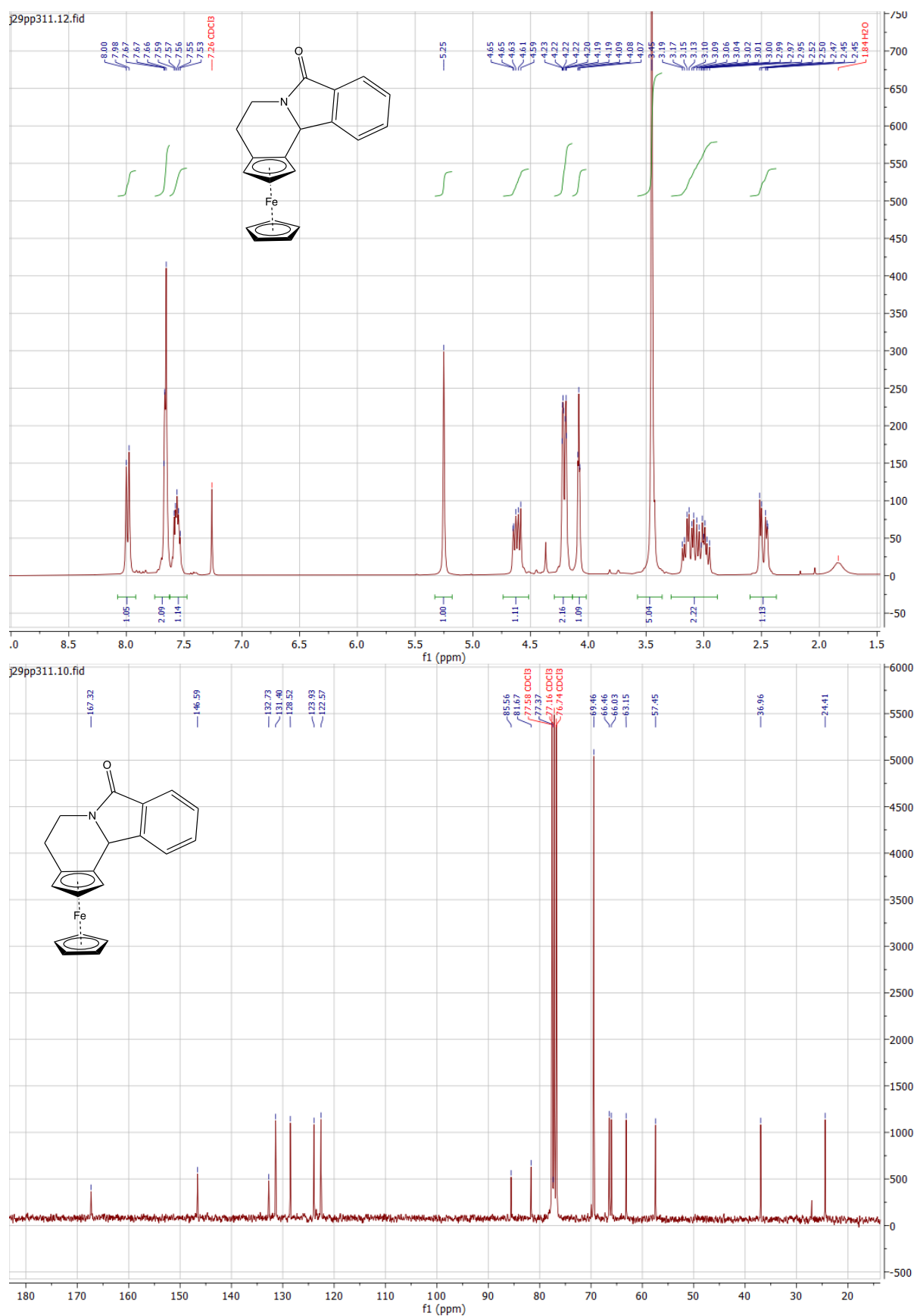
## Experimental/theoretical isotopic pattern MS spectrum

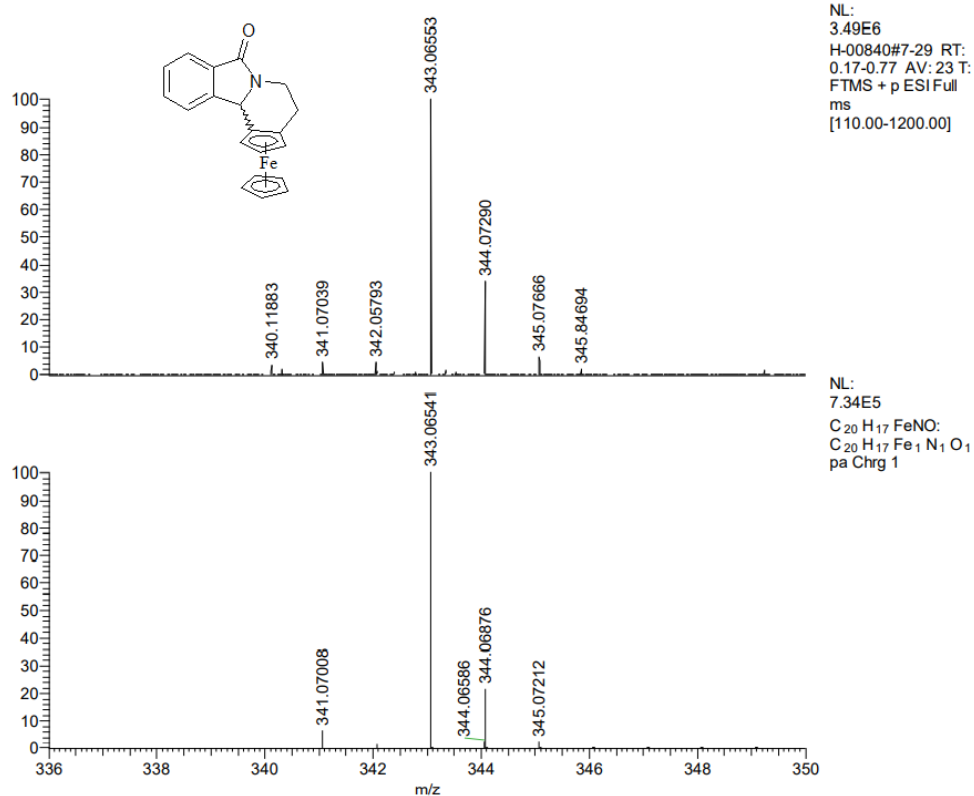
Error = 0.0 ppm; Relative Intensity (%) 100

HRMS (ESI) m/z: [M]<sup>+</sup> Calcd for C<sub>19</sub>H<sub>18</sub>FeN<sub>2</sub>O 346.0763 . Found 346.0763; (Error: 0.0 ppm).

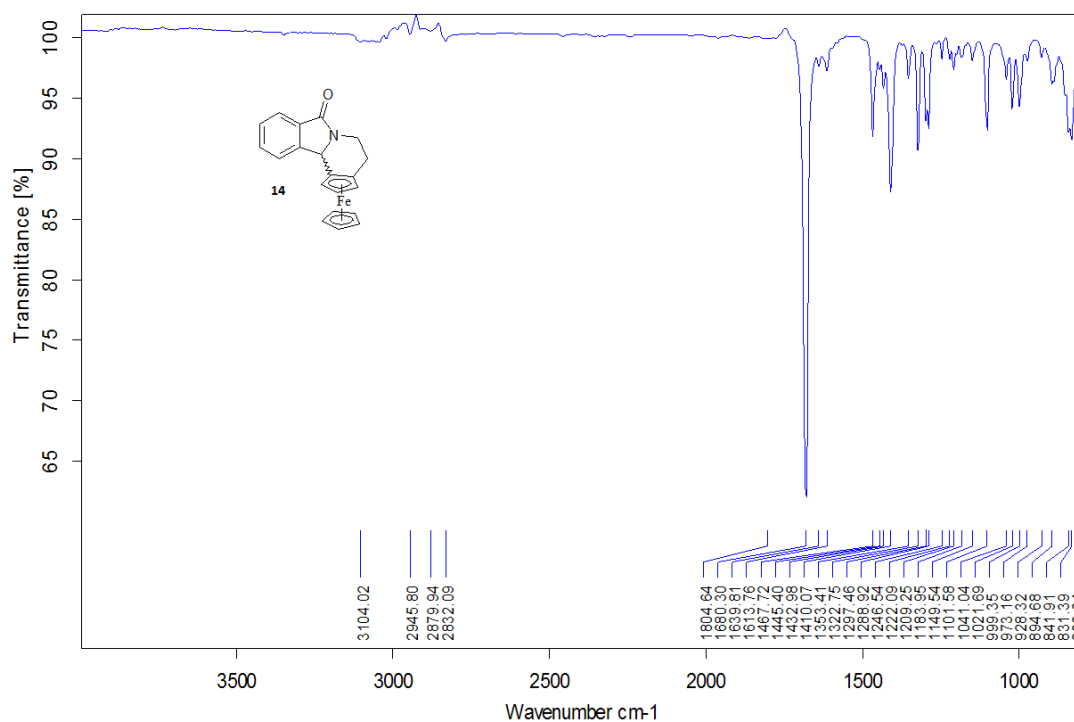


**Figure S38:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **14**

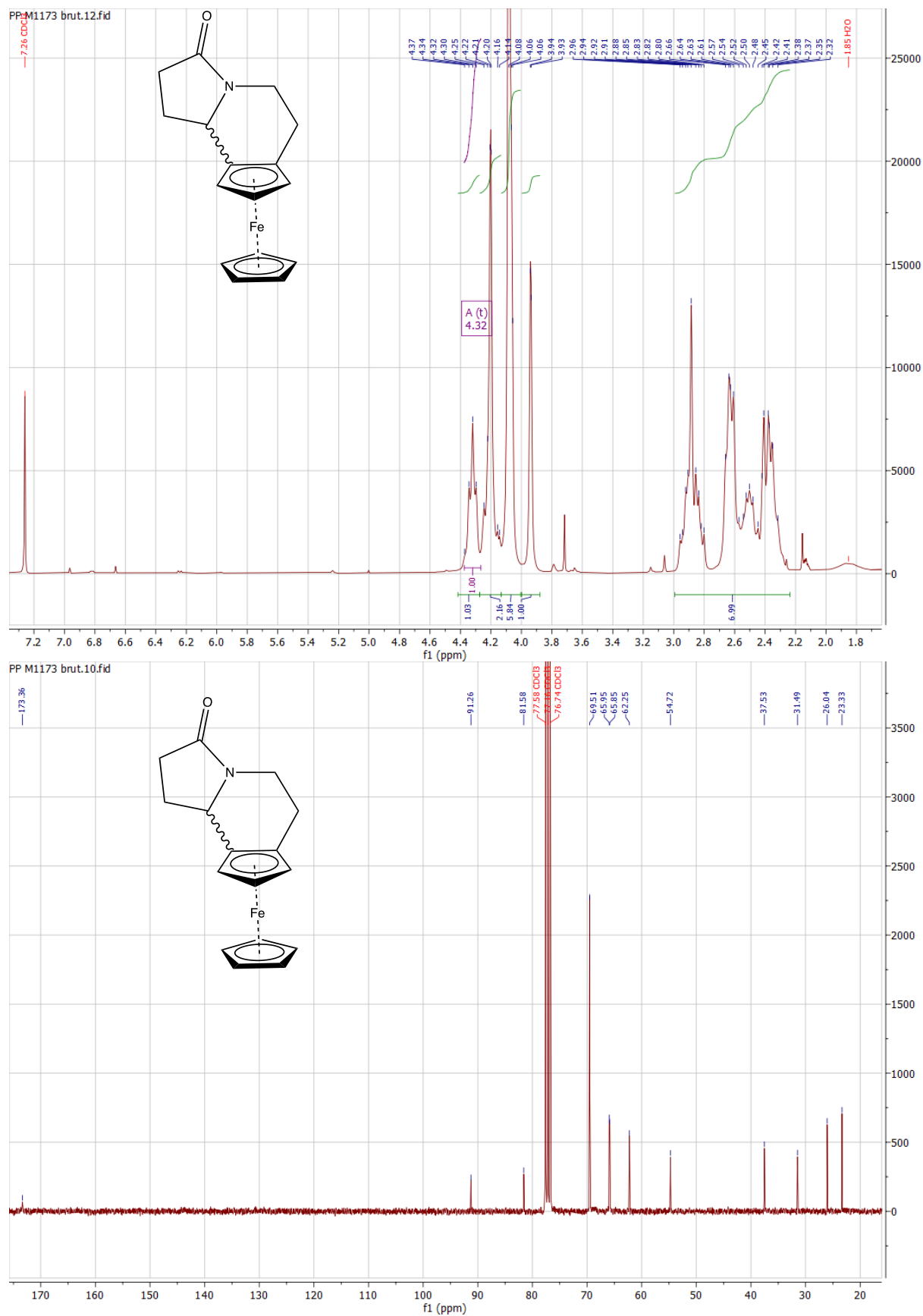


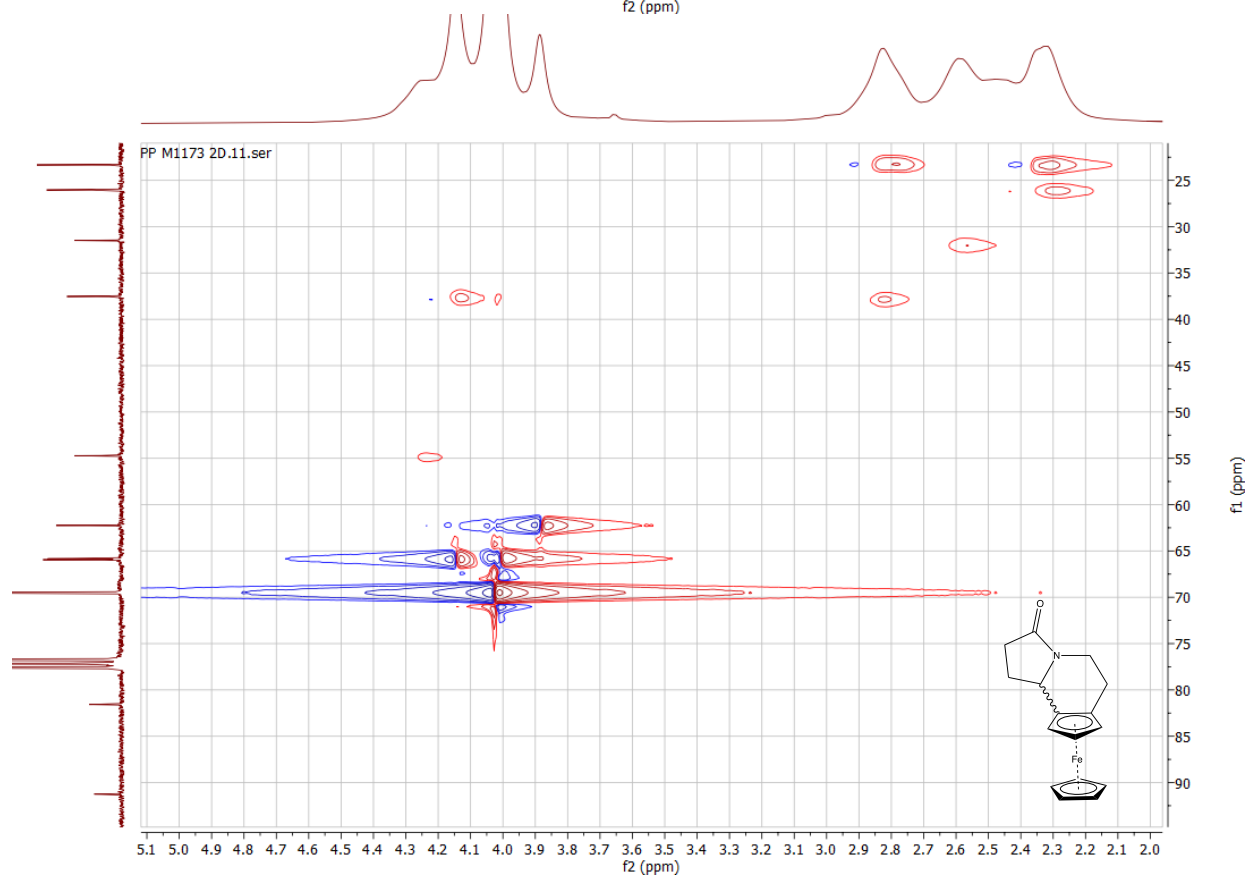
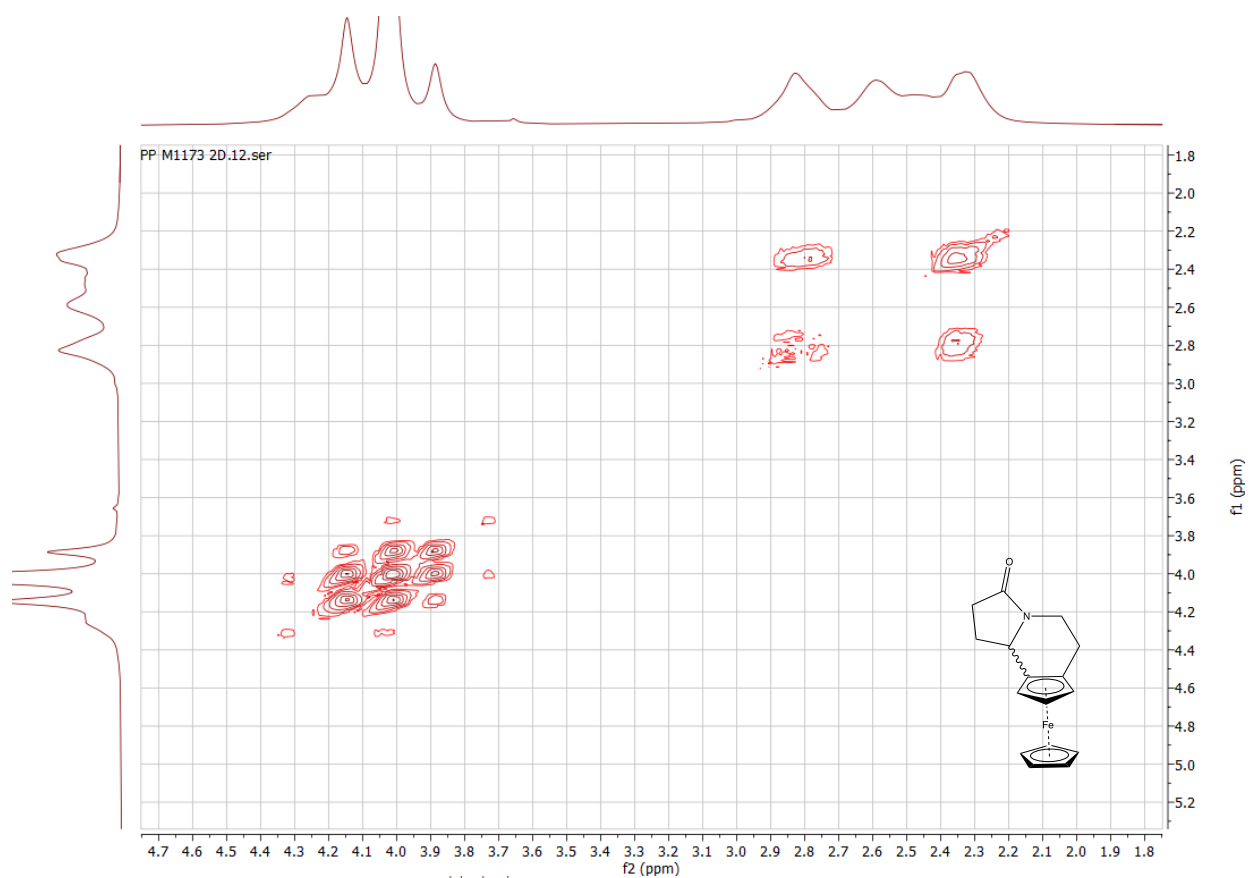


Erreur = 0.4 ppm (erreur calculée pour l'ion expérimental 343.06553 par rapport à la valeur théorique de 343.06541)

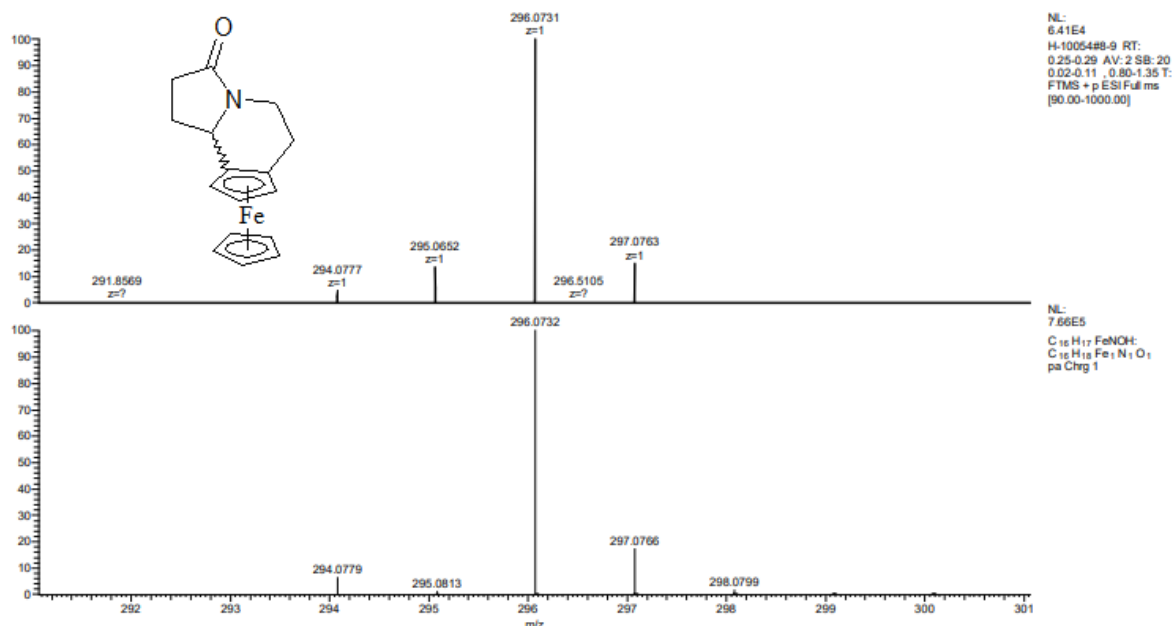


**Figure S39:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ), COSY (in  $\text{CDCl}_3$ ), HMQC (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **15**





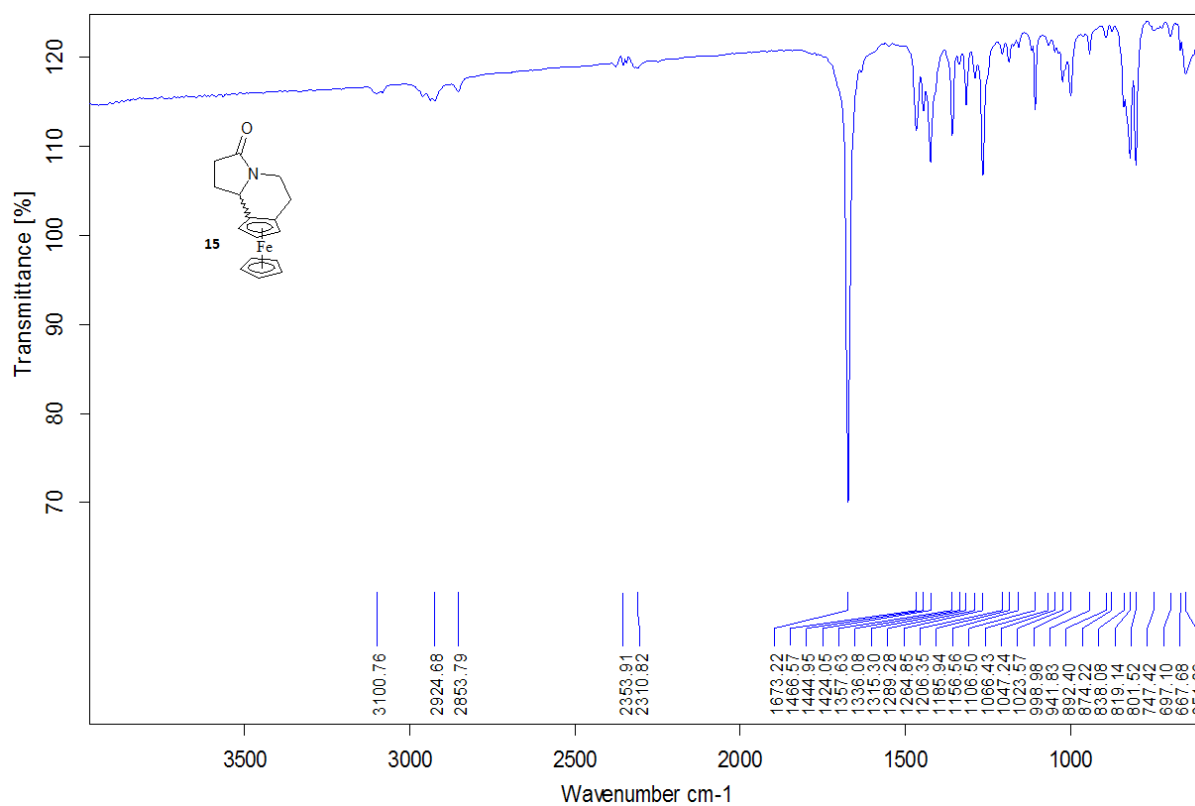




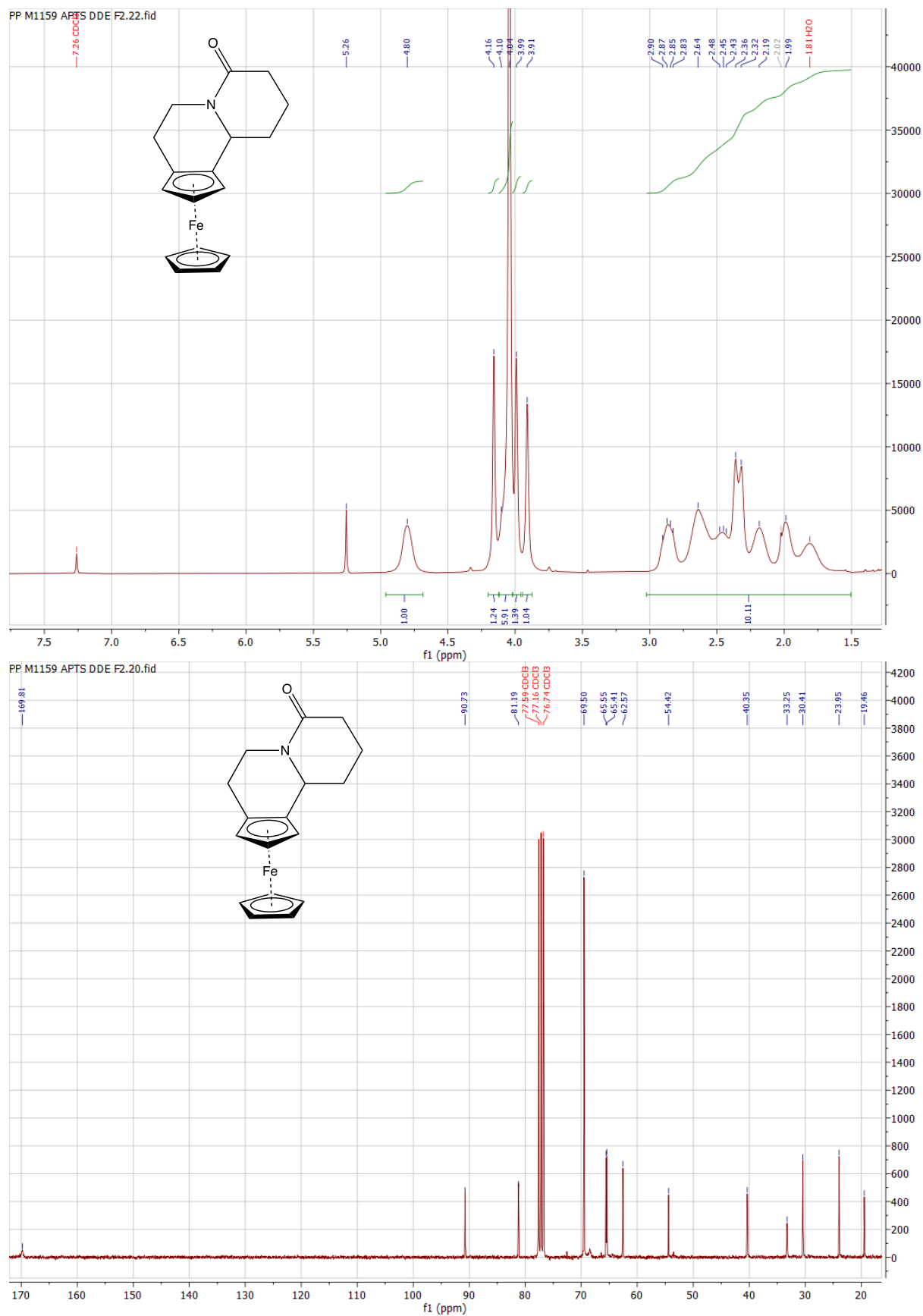
## Experimental/theoretical isotopic pattern MS spectrum

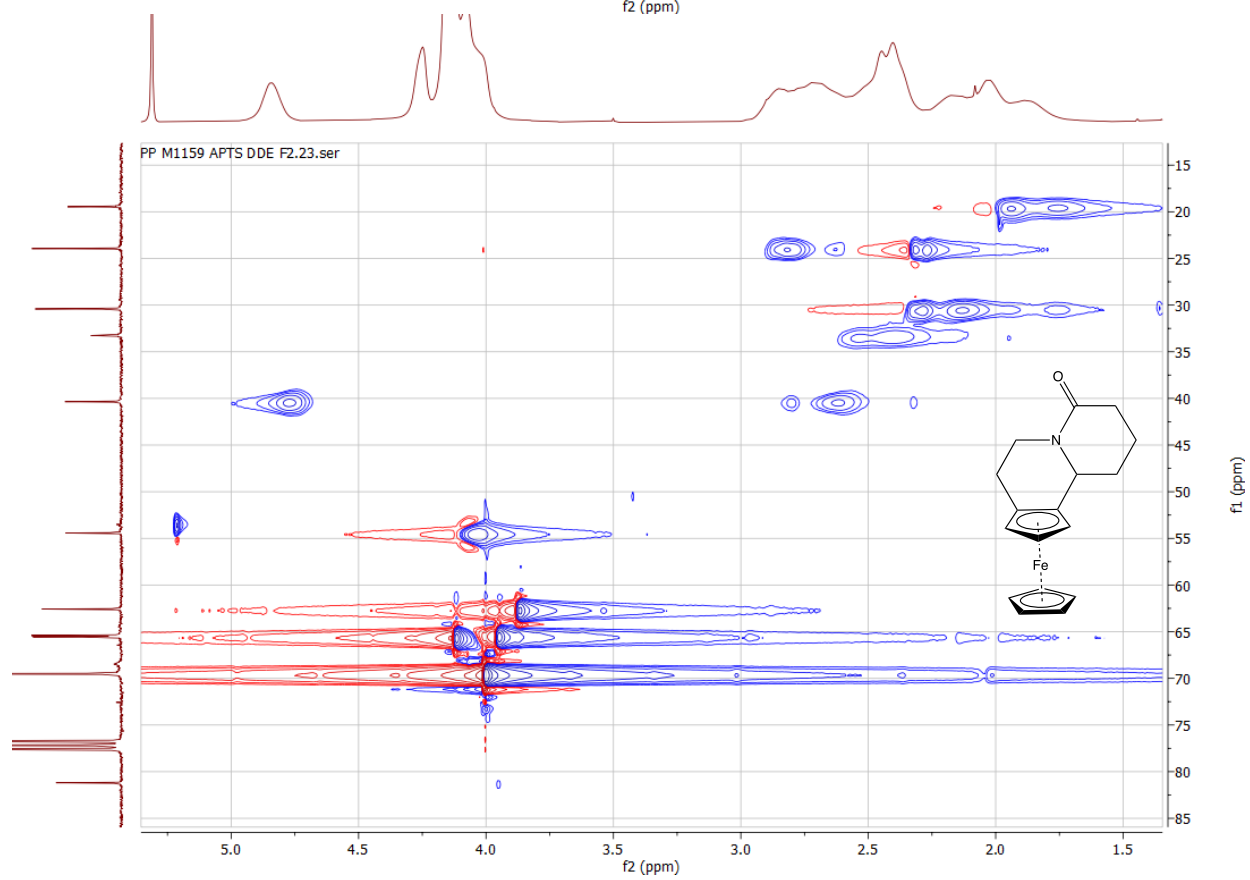
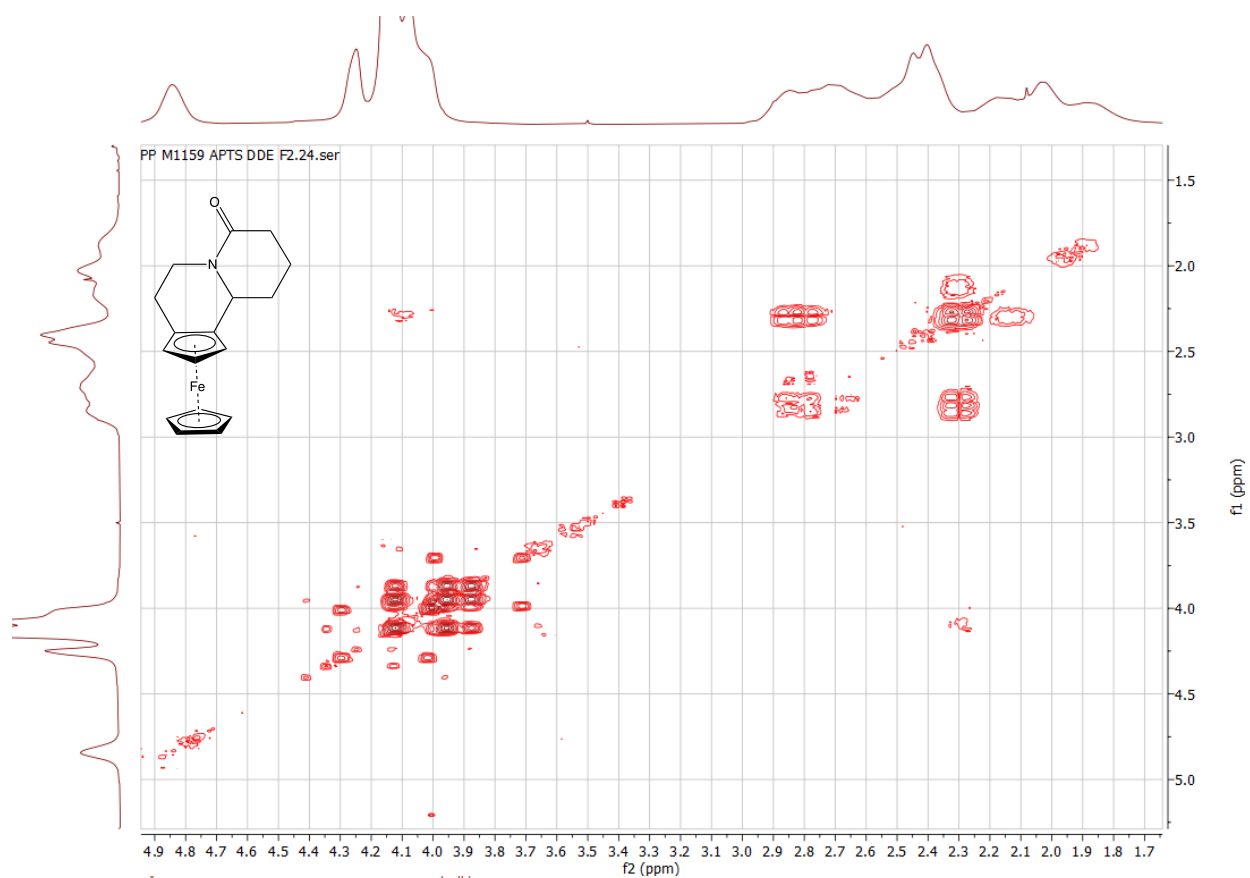
Error = -0.4 ppm; Relative Intensity (%) 100

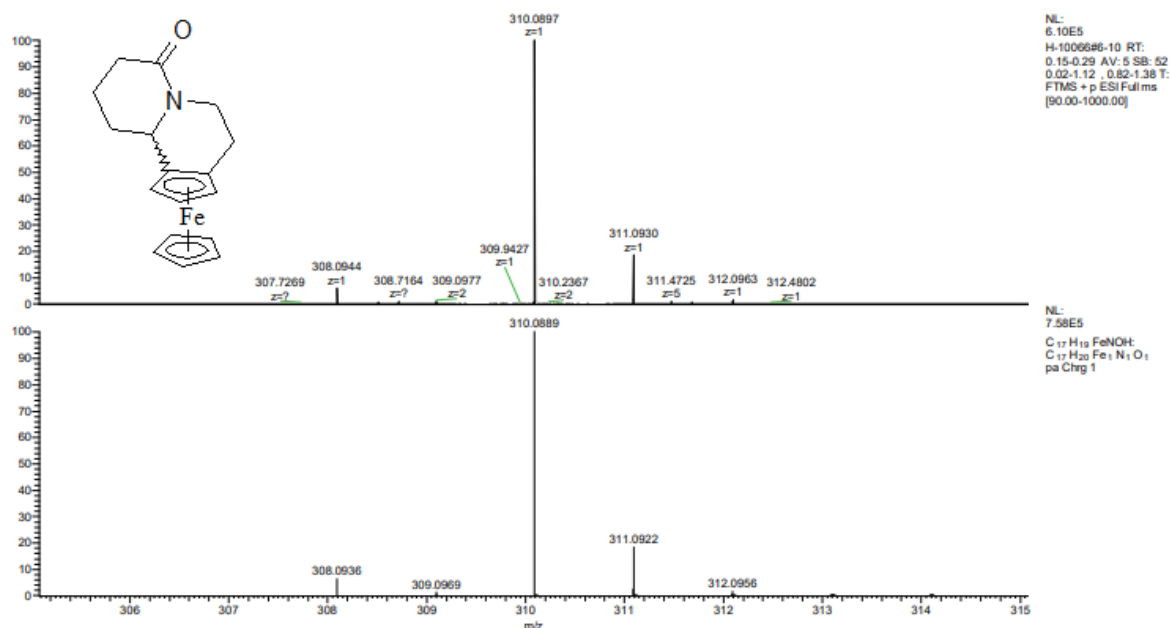
HRMS (ESI) m/z: [M+H]<sup>+</sup> Calcd for C<sub>16</sub>H<sub>17</sub>FeNOH 296.0732. Found 296.0731; (Error: -0.4 ppm).



**Figure S40:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ), COSY (in  $\text{CDCl}_3$ ), HMQC (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **16**



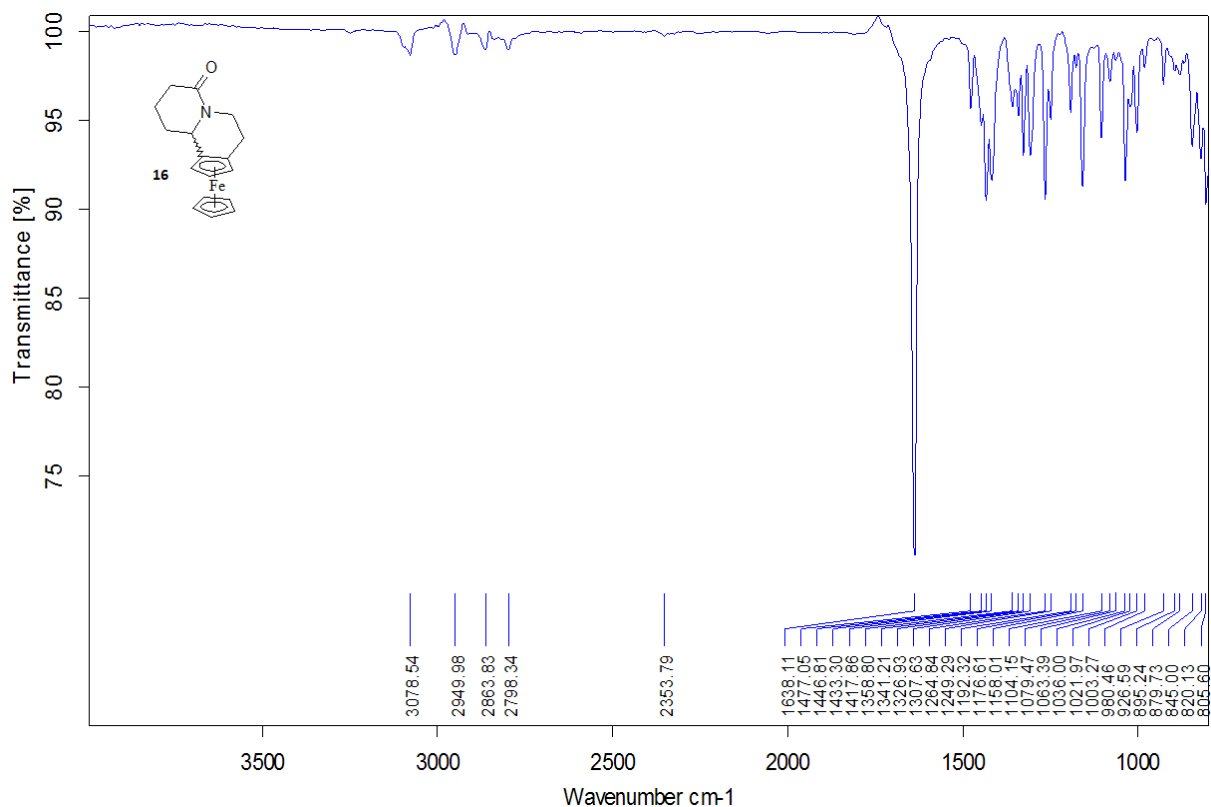




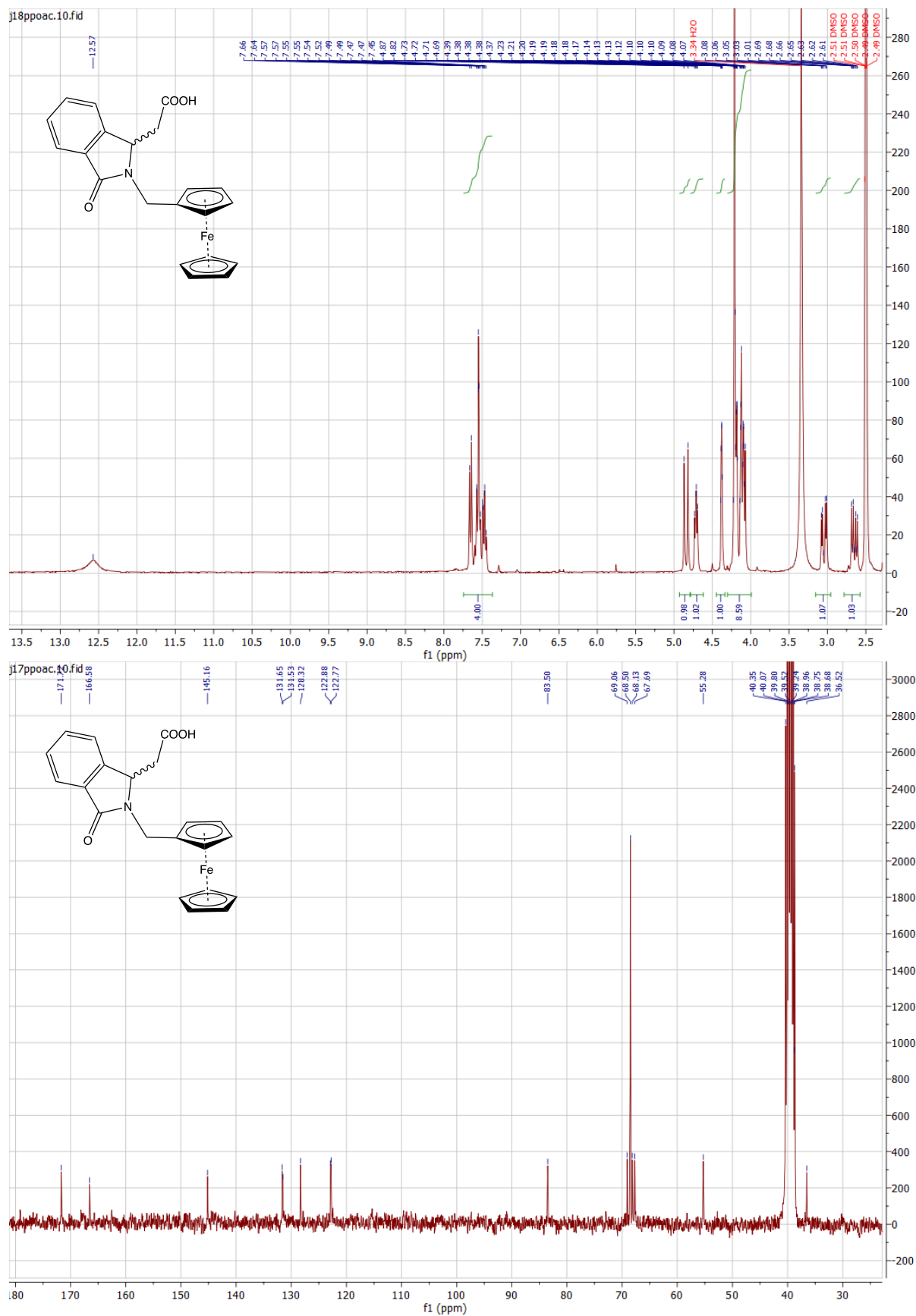
## Experimental/theoretical isotopic pattern MS spectrum

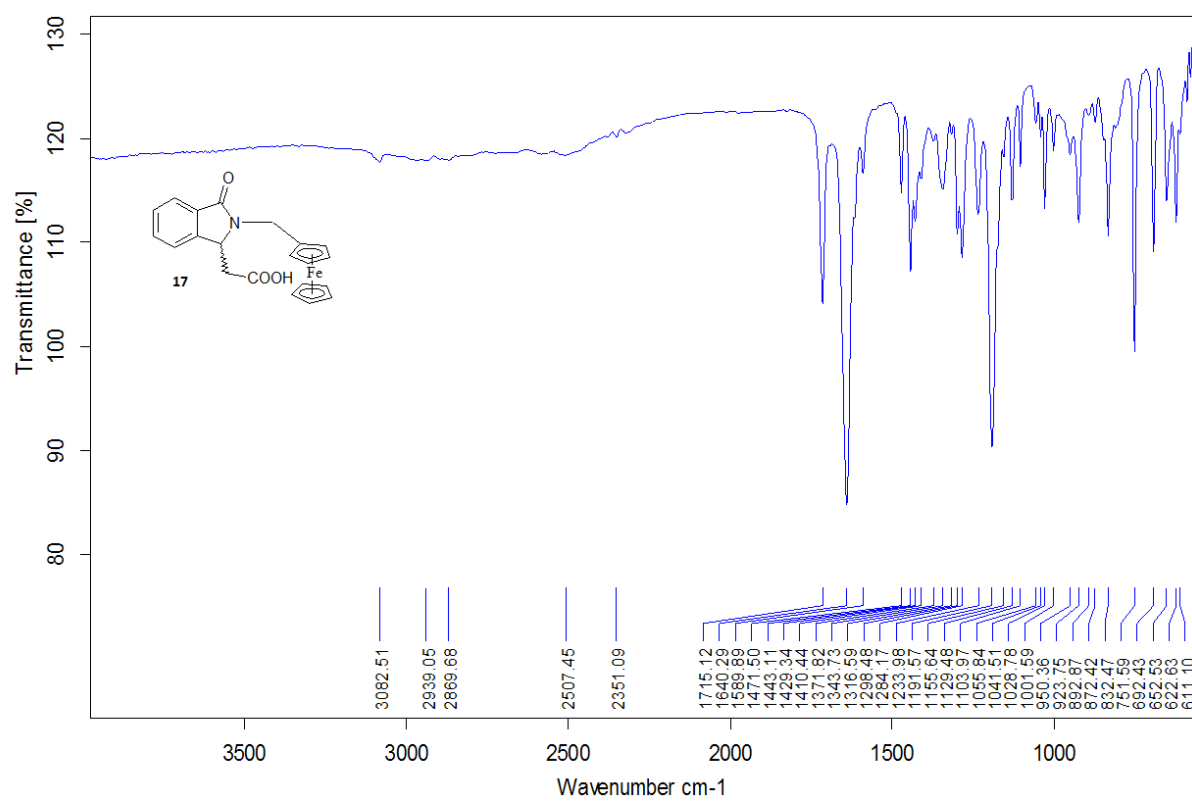
Error = 2.7 ppm; Relative Intensity (%) 100

HRMS (ESI) m/z: [M+H]<sup>+</sup> Calcd for C<sub>17</sub>H<sub>19</sub>FeNOH 310.0889. Found 310.0897; (Error: 2.7 ppm).

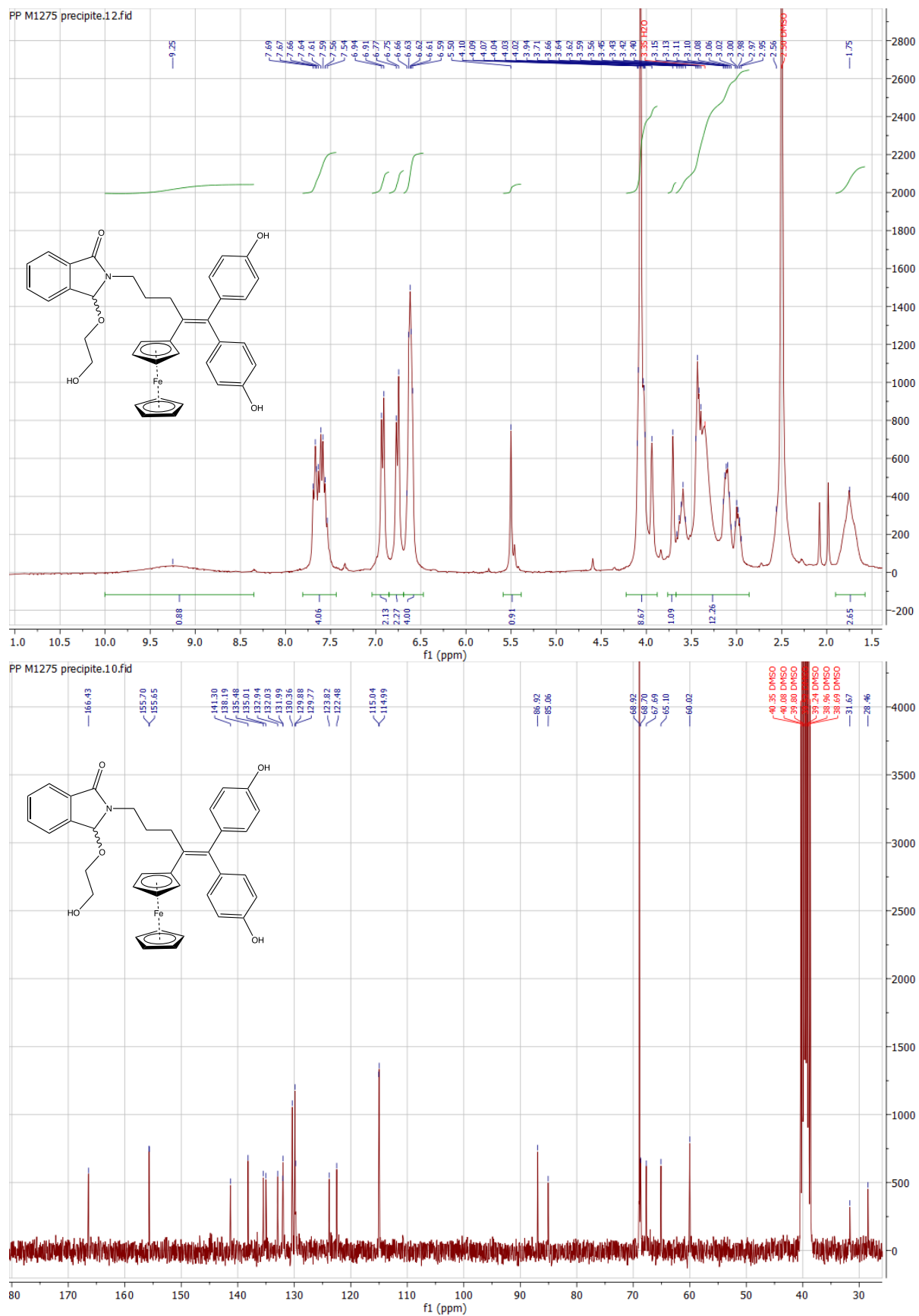


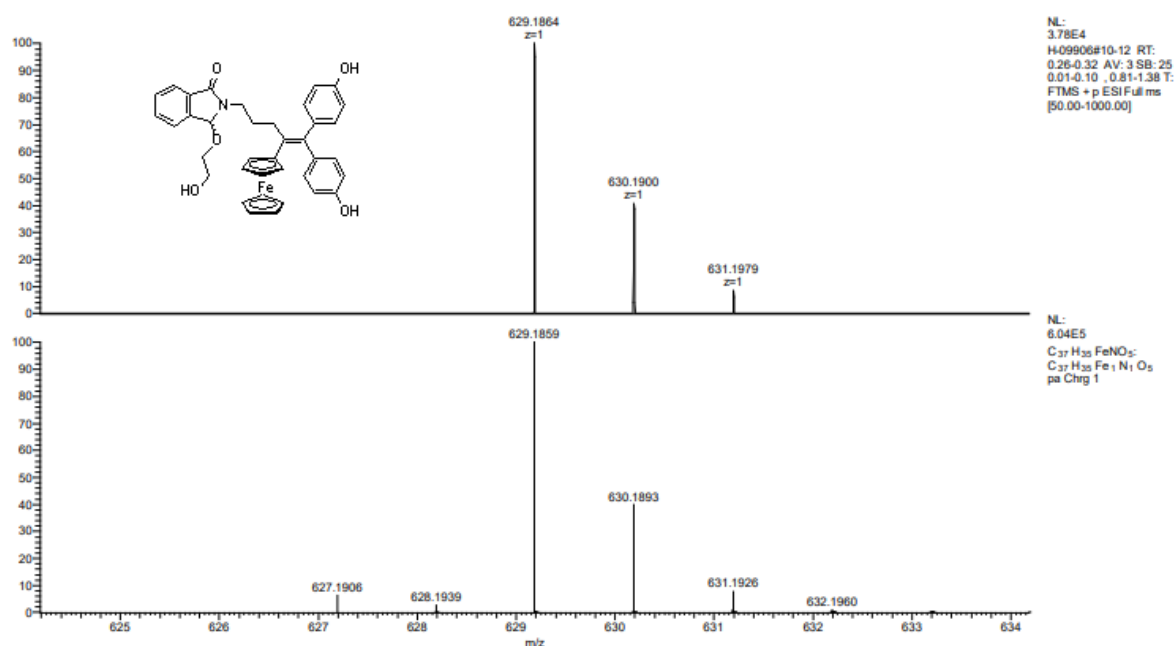
**Figure S41:**  $^1\text{H}$  (in  $\text{DMSO-d}_6$ ),  $^{13}\text{C}$  (in  $\text{DMSO-d}_6$ ) and COSY (in  $\text{DMSO-d}_6$ ) NMR and IR data for compound **17**





**Figure S42:**  $^1\text{H}$  (in  $\text{DMSO-d}_6$ ) and  $^{13}\text{C}$  (in  $\text{DMSO-d}_6$ ) NMR, HR-MS and IR data for compound **20**

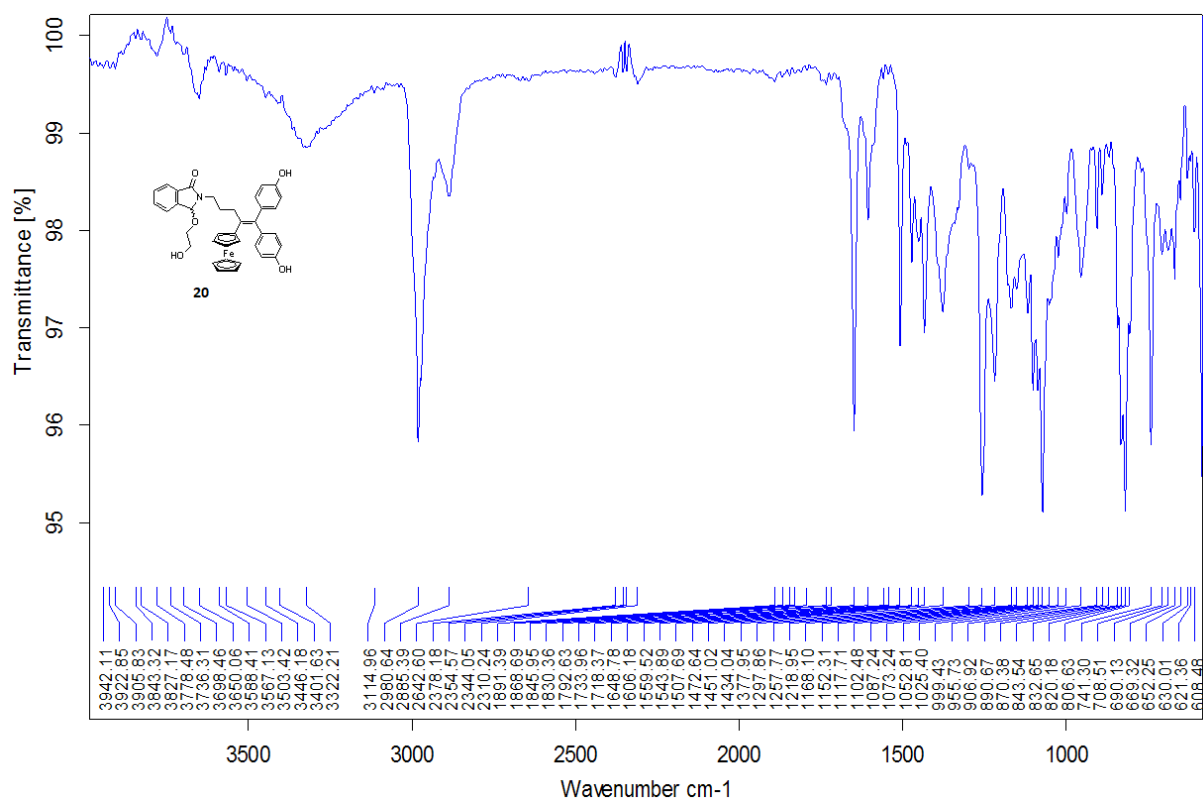




## Experimental/theoretical isotopic pattern MS spectrum

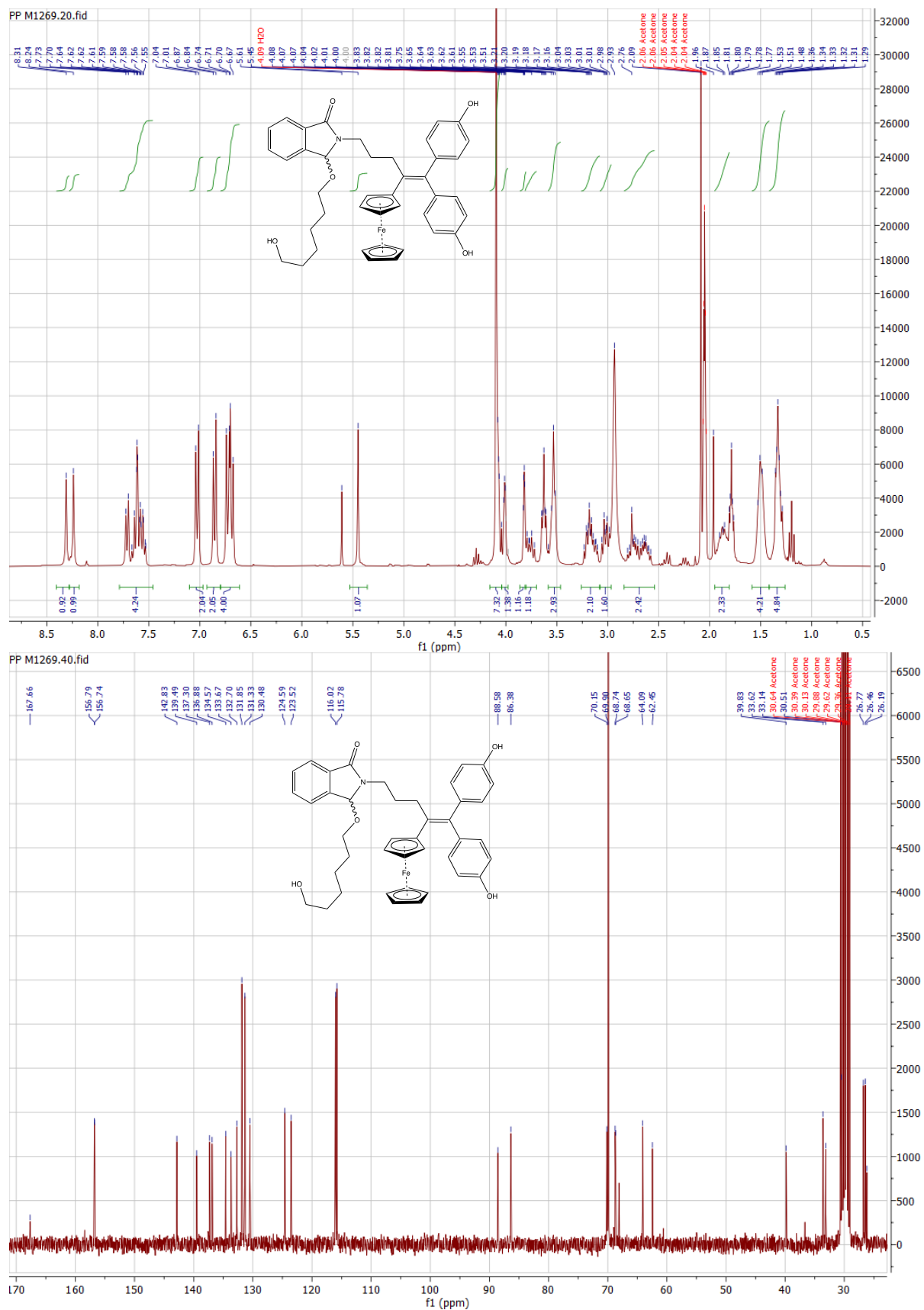
Error = 0.8 ppm; Relative Intensity (%) 100

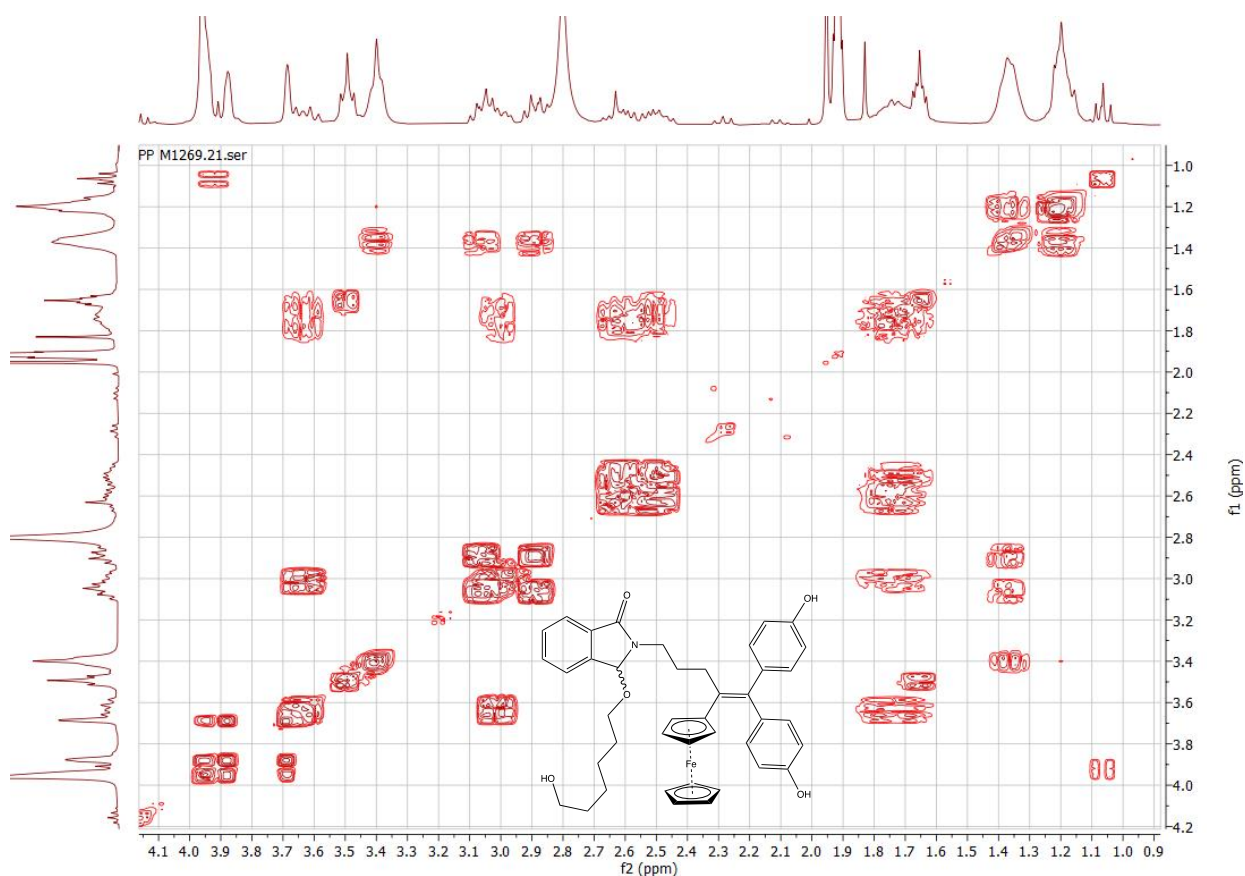
HRMS (ESI) m/z: [M]<sup>+</sup> Calcd for C<sub>37</sub>H<sub>35</sub>FeNO<sub>5</sub> 629.1859 . Found 629.1864; (Error: 0.8 ppm).





**Figure S43:**  $^1\text{H}$  (in acetone- $d_6$ ),  $^{13}\text{C}$  (in acetone- $d_6$ ) and COSY (in acetone- $d_6$ ) NMR, HR-MS and IR data for compound **21**

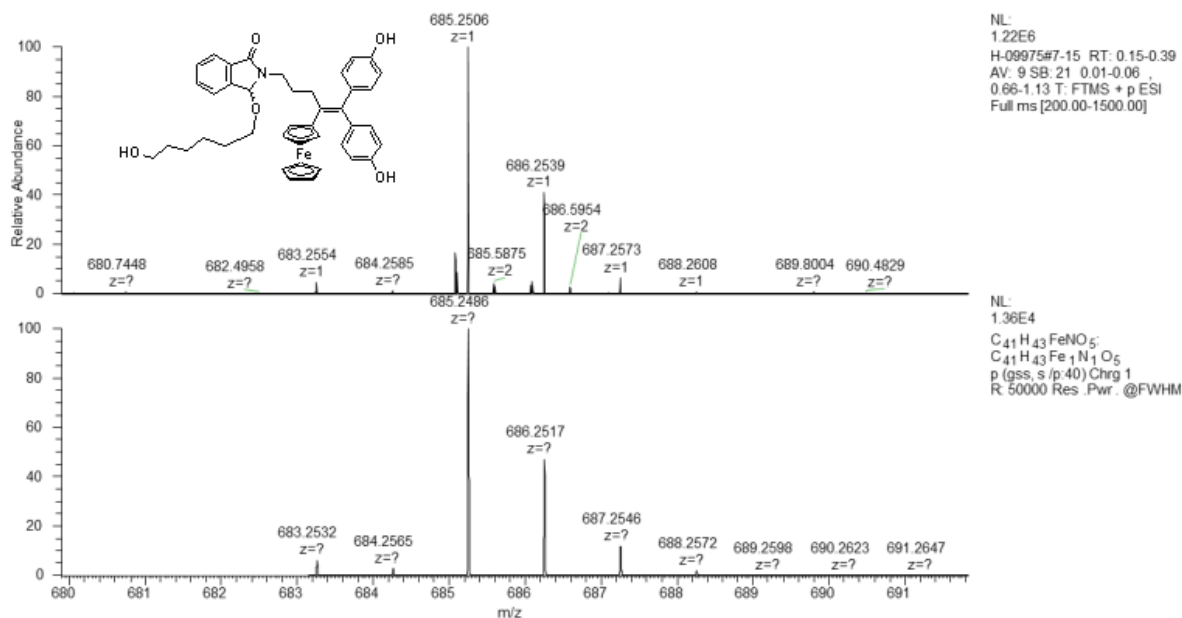




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MeCN

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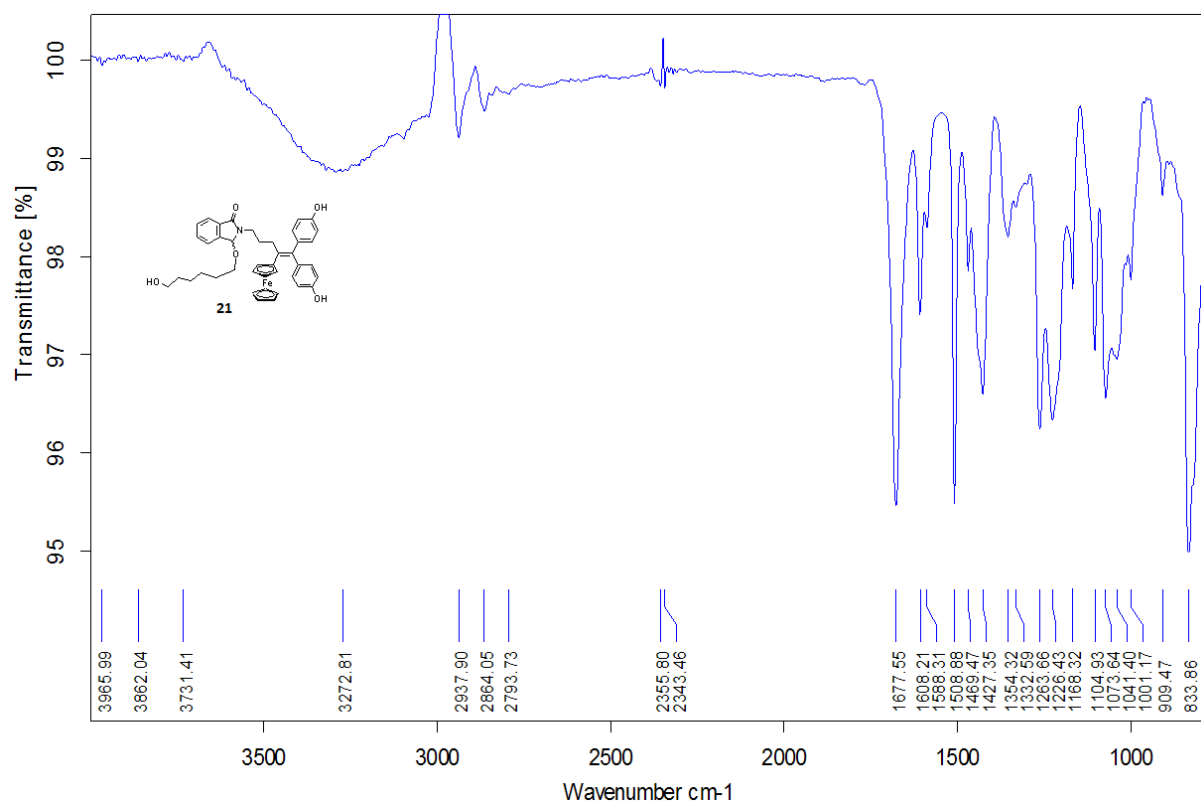
Pascal Pigeon P1006



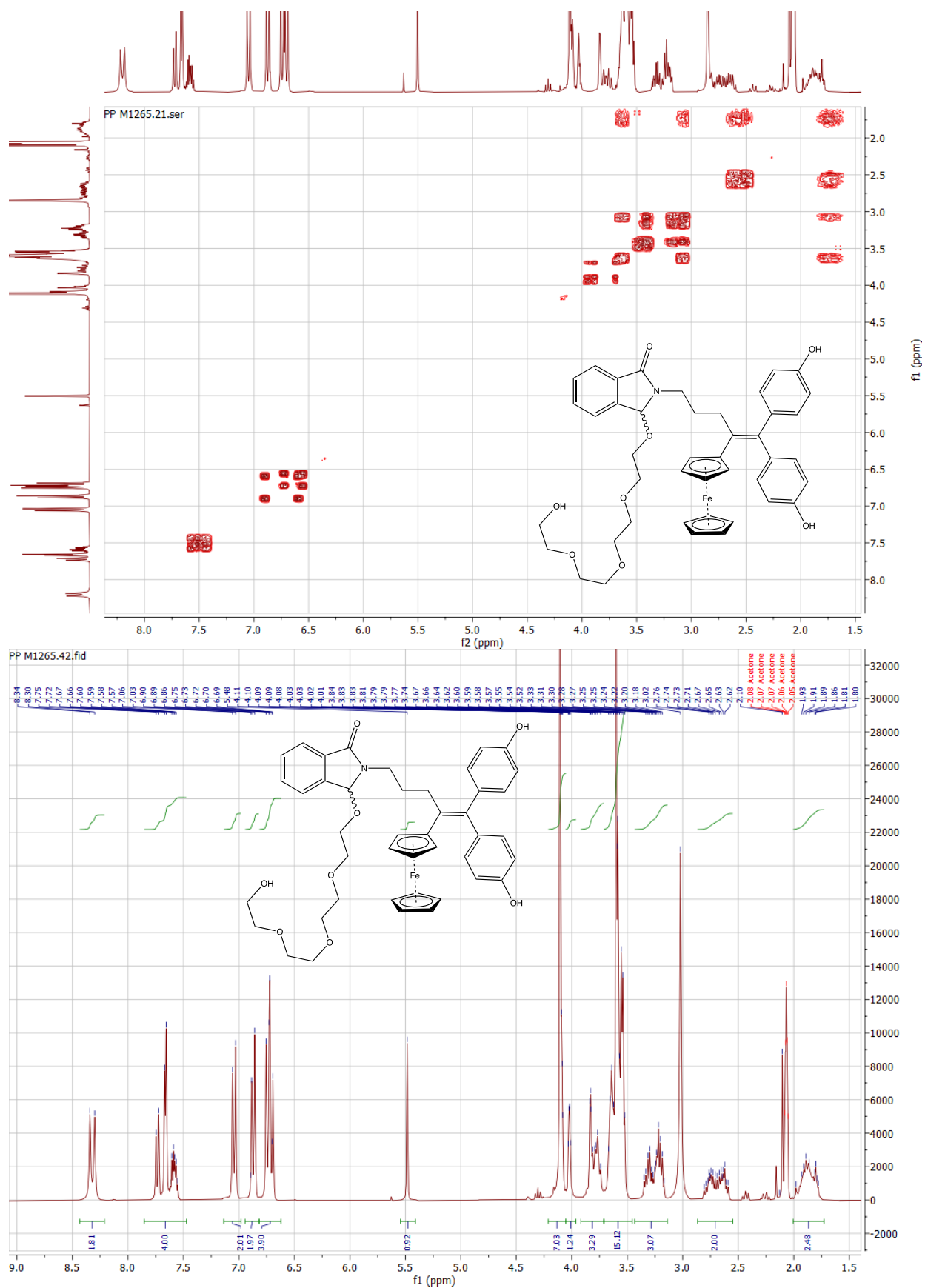
## Experimental/theoretical isotopic pattern MS spectrum

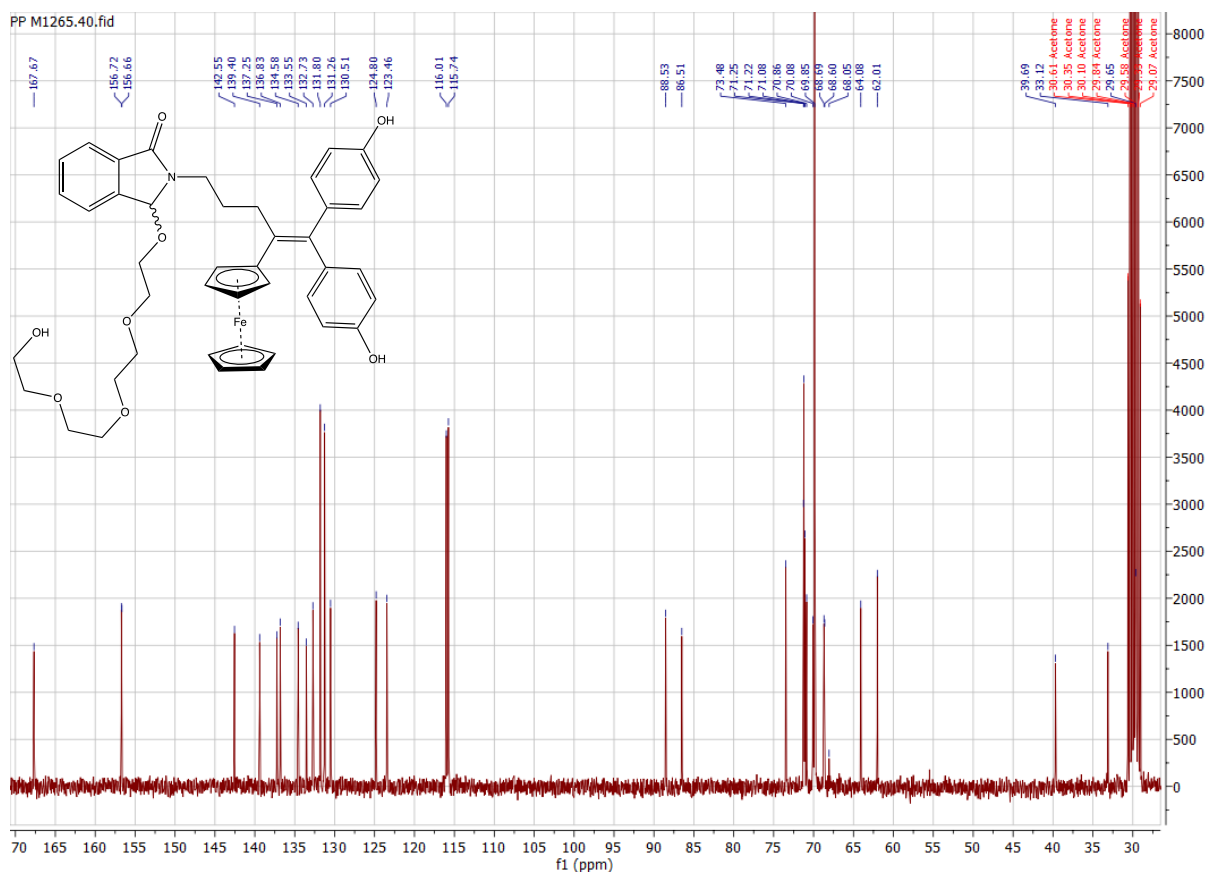
Error = 2.9 ppm; Relative Intensity (%) 100

HRMS (ESI) m/z: [M]<sup>+</sup> Calcd for C<sub>41</sub>H<sub>43</sub>FeNO<sub>5</sub> 685.2486 . Found 685.2506; (Error: 2.9 ppm).



**Figure 44:** COSY (in acetone- $d_6$ ),  $^1\text{H}$  (in acetone- $d_6$ ),  $^{13}\text{C}$  (in acetone- $d_6$ ) NMR, HR-MS and IR data for compound **22**

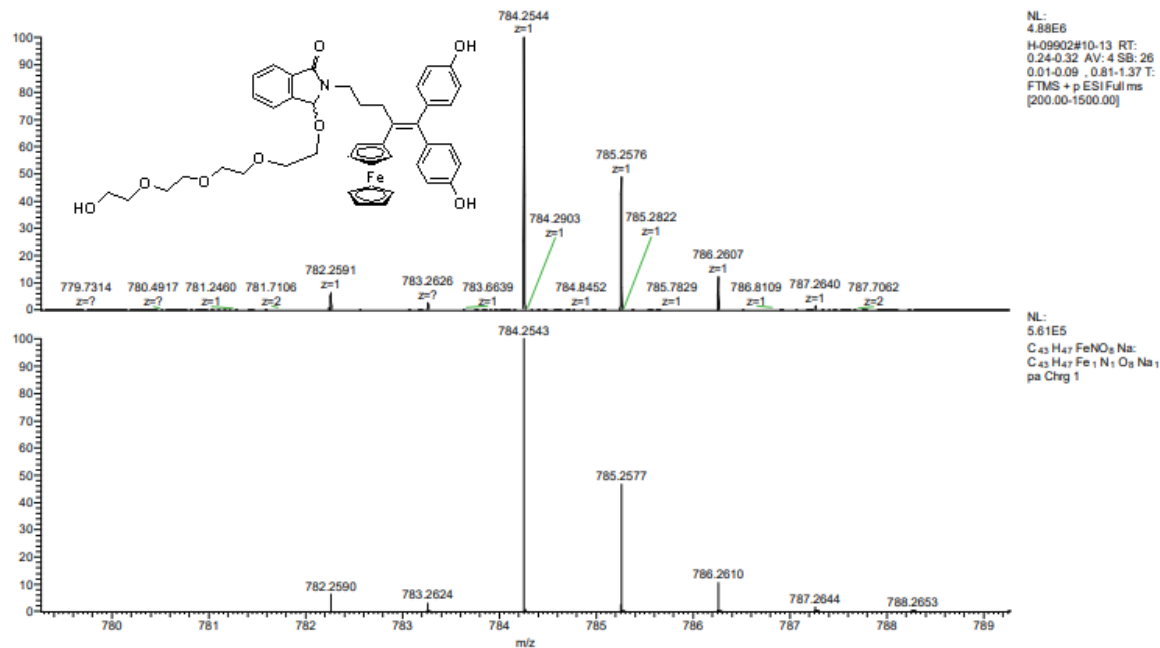




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MeOH

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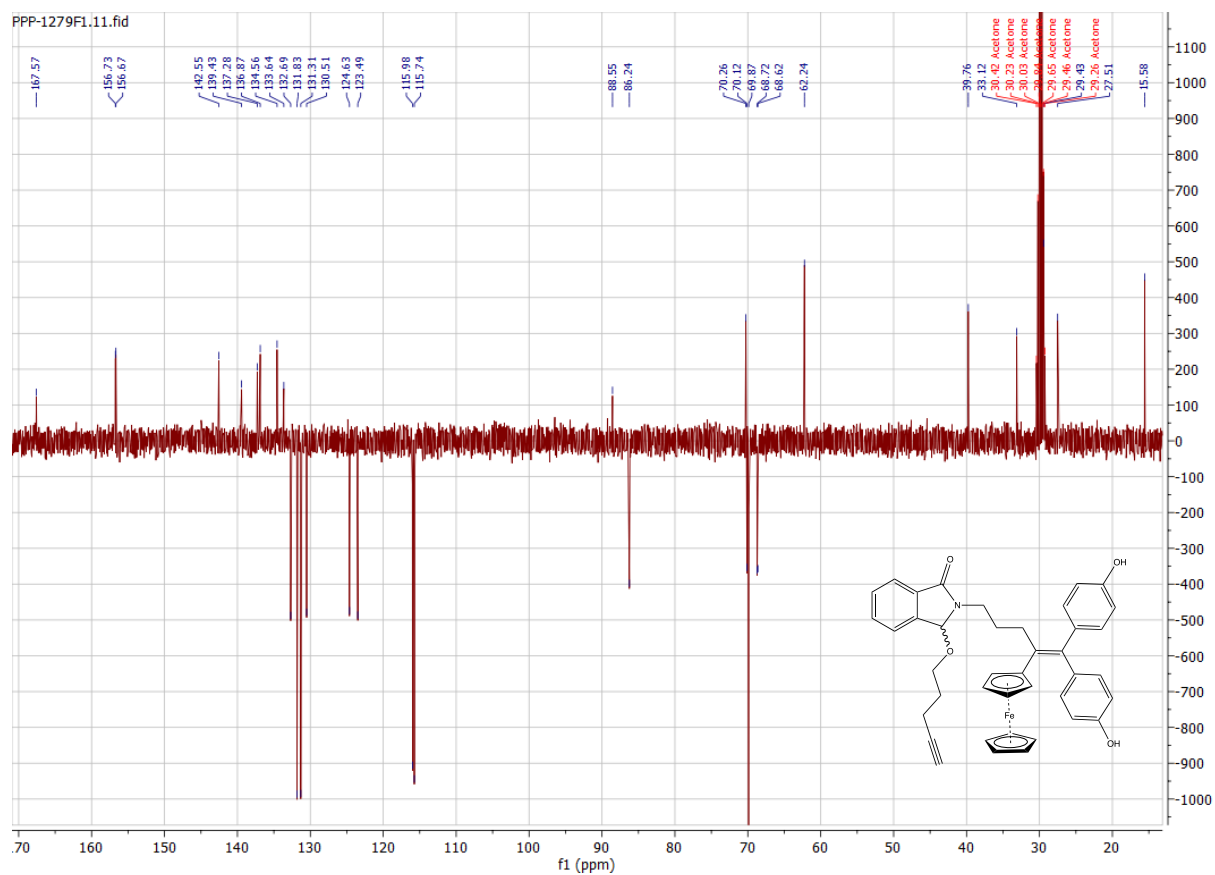
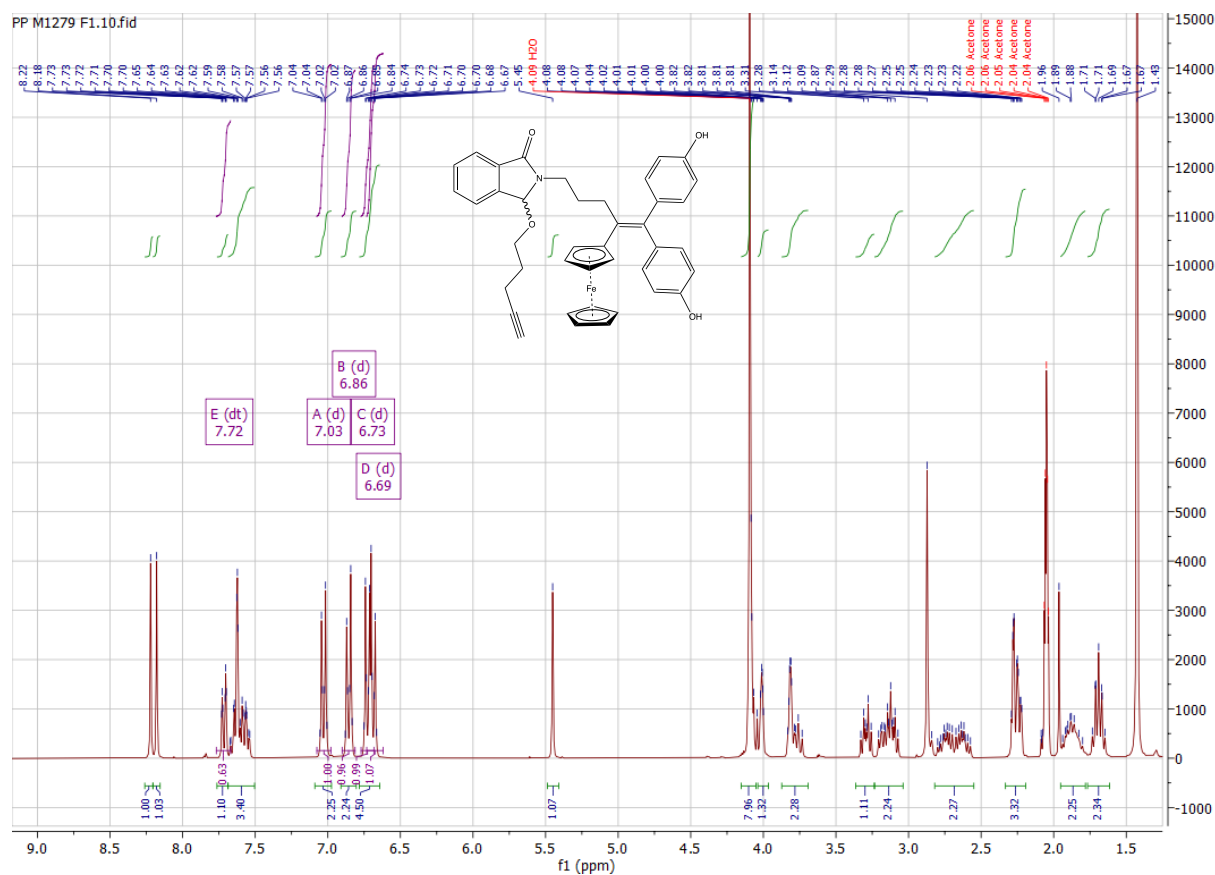
## Experimental/theoretical isotopic pattern MS spectrum

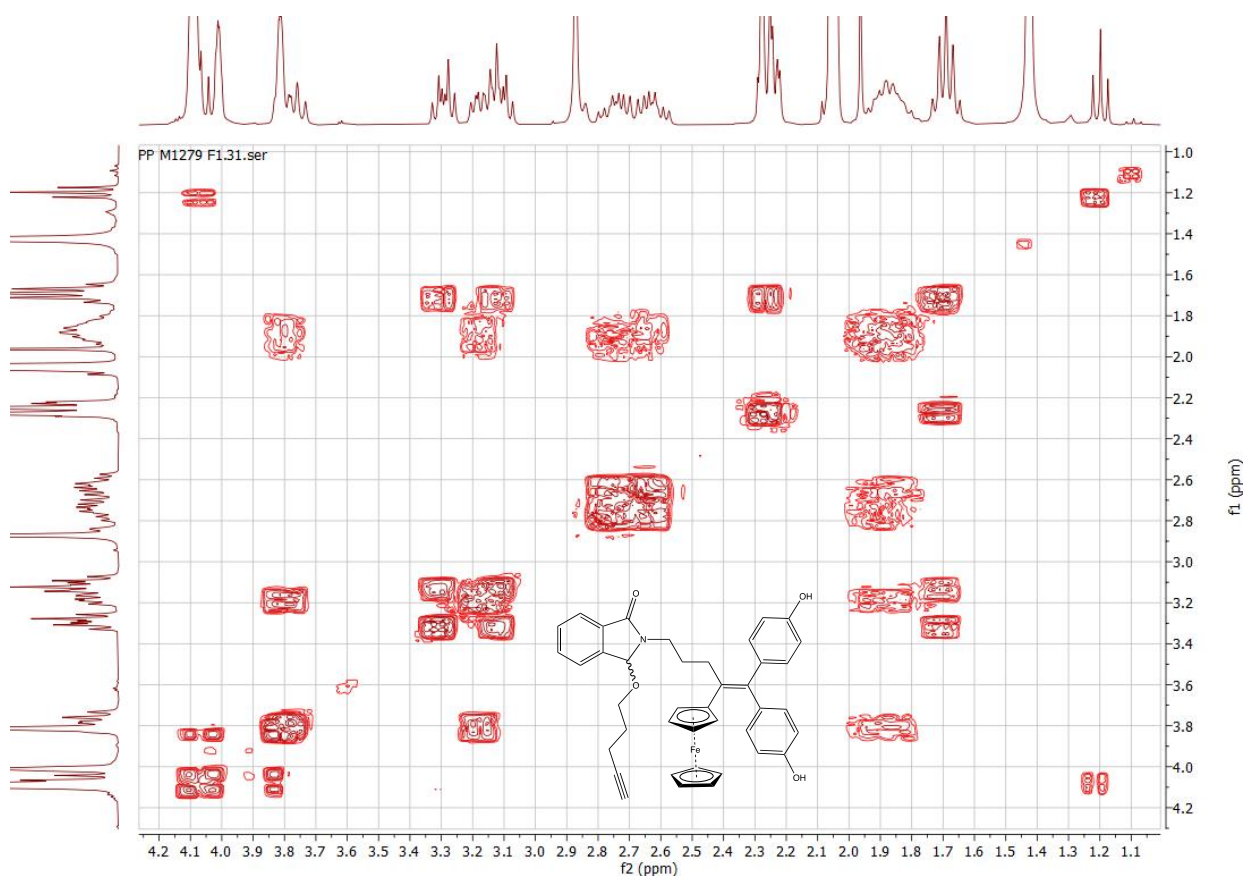
Error = 0.1 ppm; Relative Intensity (%) 100

HRMS (ESI) m/z: [M+Na]<sup>+</sup> Calcd for C<sub>43</sub>H<sub>47</sub>FeNO<sub>8</sub>Na 784.2543. Found 784.2544; (Error: 0.1 ppm).



**Figure S45:**  $^1\text{H}$  (in acetone- $d_6$ ), JMOD (in acetone- $d_6$ ), COSY (in acetone- $d_6$ ) NMR, HR-MS and IR data for compound **23**

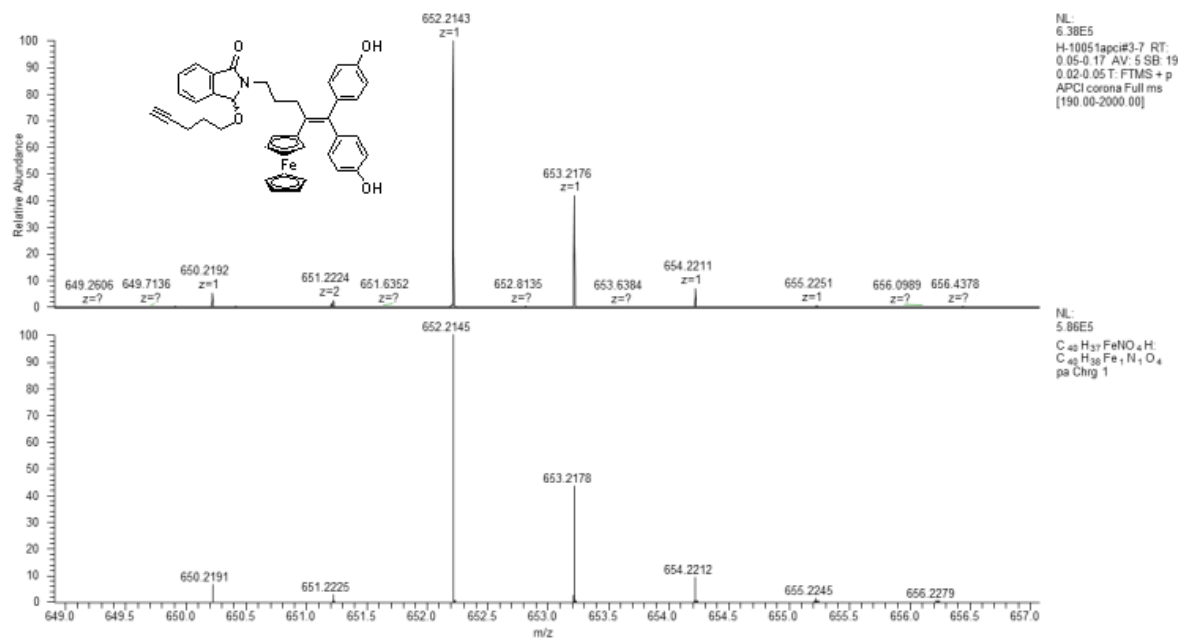




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MeCN

04/04/22 16 05 12

Pascal Pigeon P1013

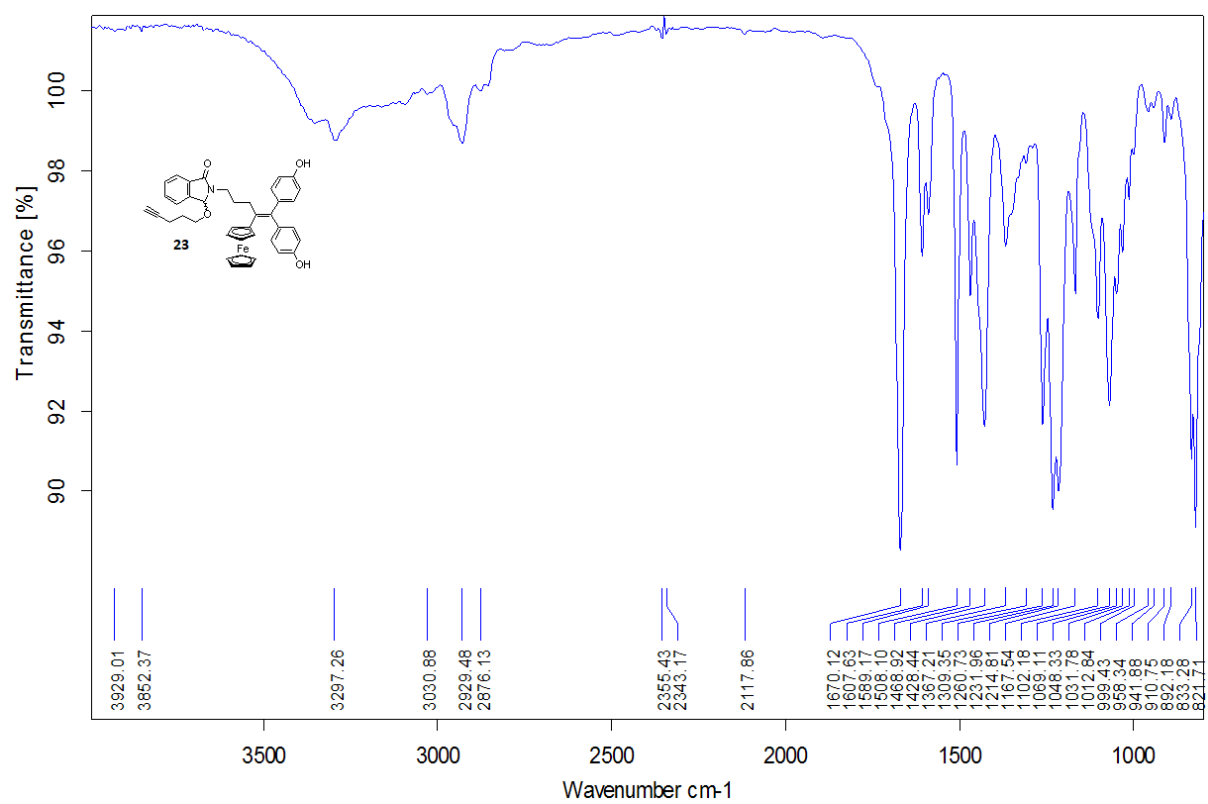


## Experimental/theoretical isotopic pattern MS spectrum

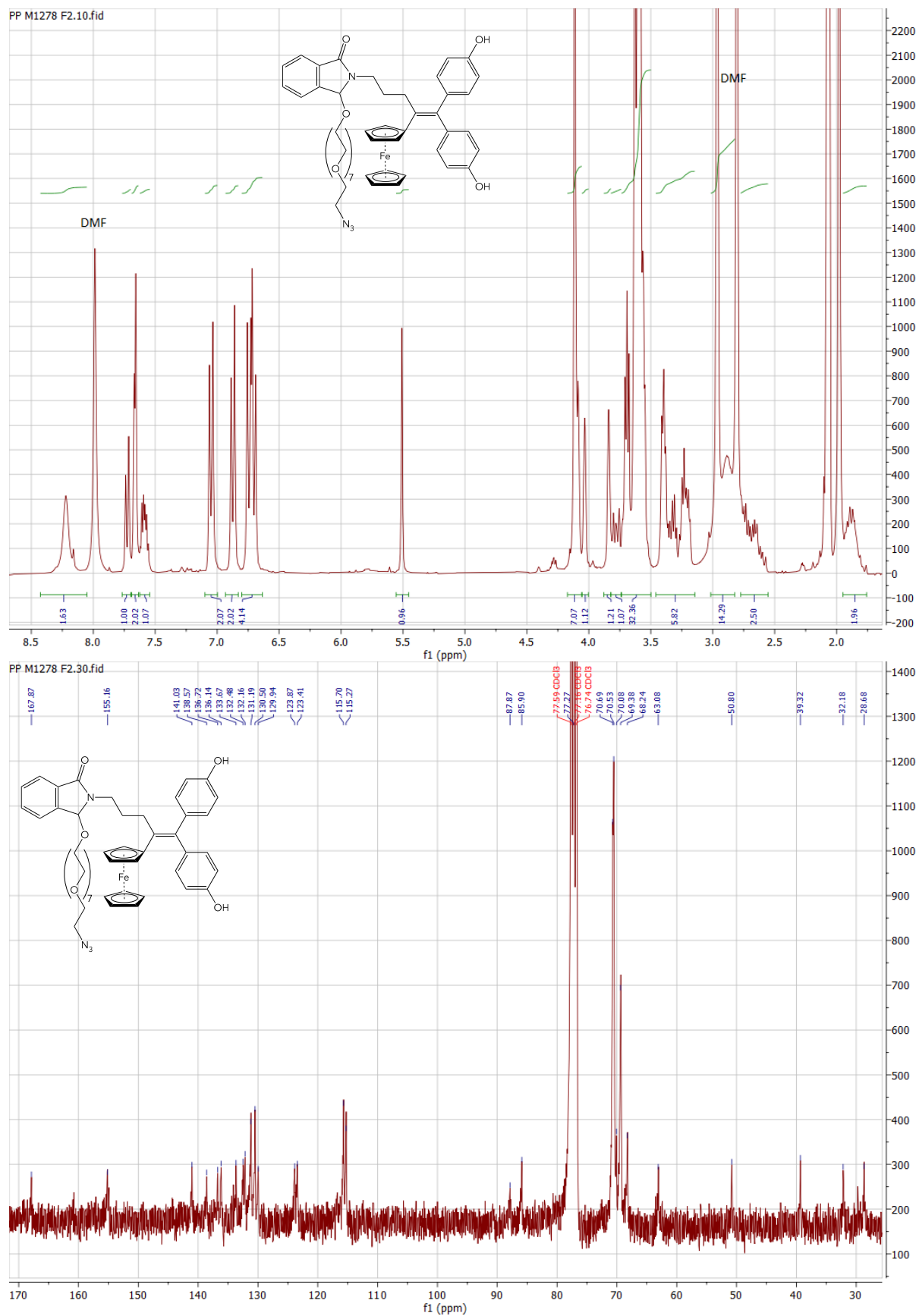
Error = -0.3 ppm; Relative Intensity (%) 100

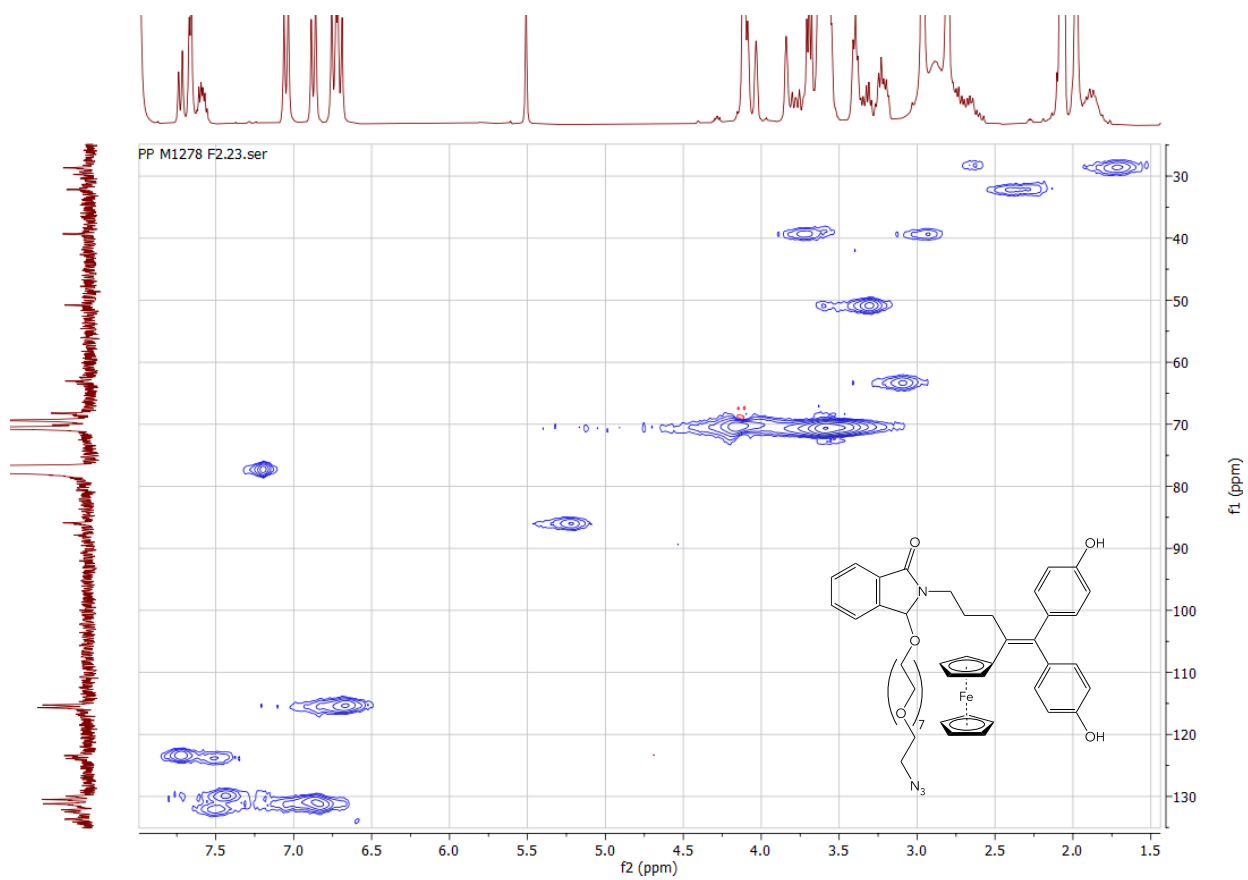
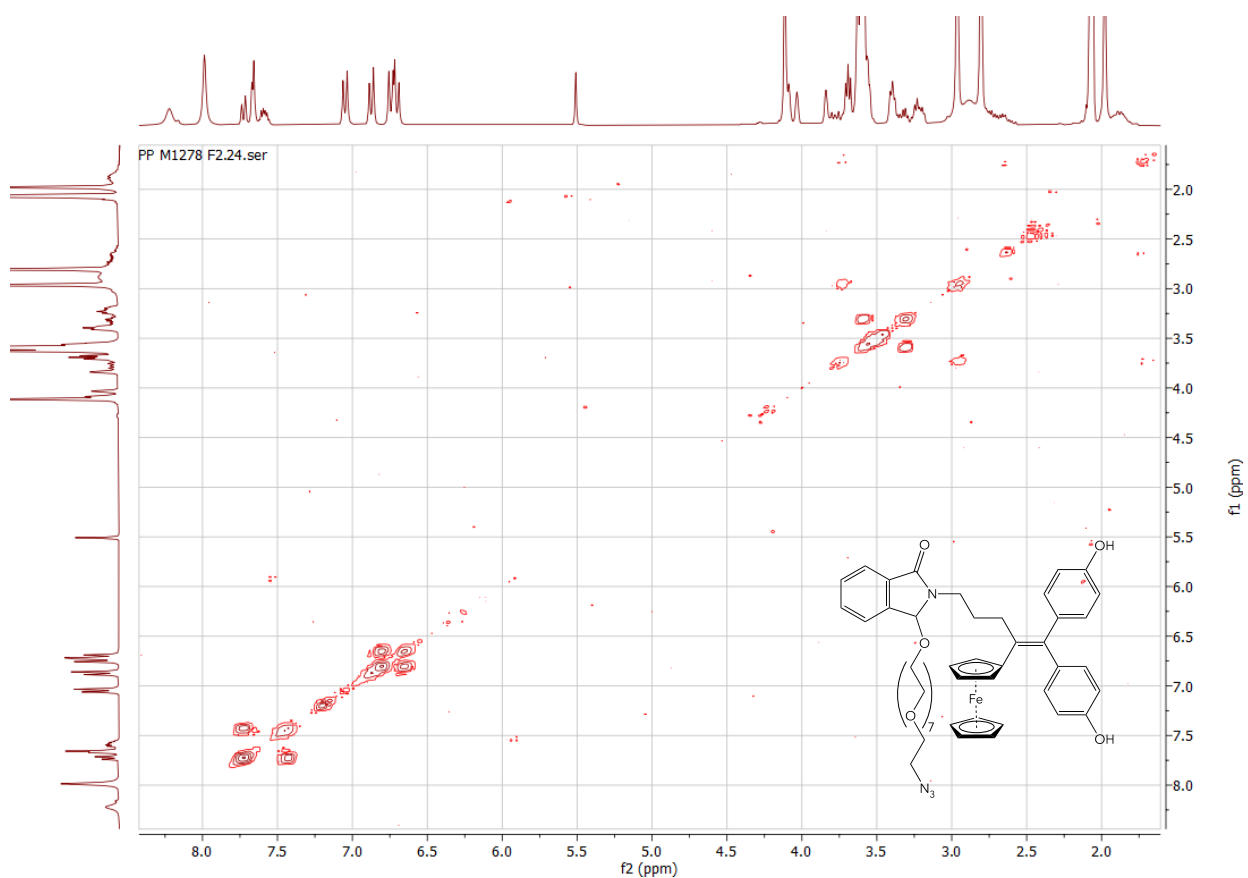
HRMS (APCI) m/z: [M+H]<sup>+</sup> Calcd for C<sub>40</sub>H<sub>37</sub>FeNO<sub>4</sub>H 652.2145. Found 652.2143; (Error: -0.3 ppm).

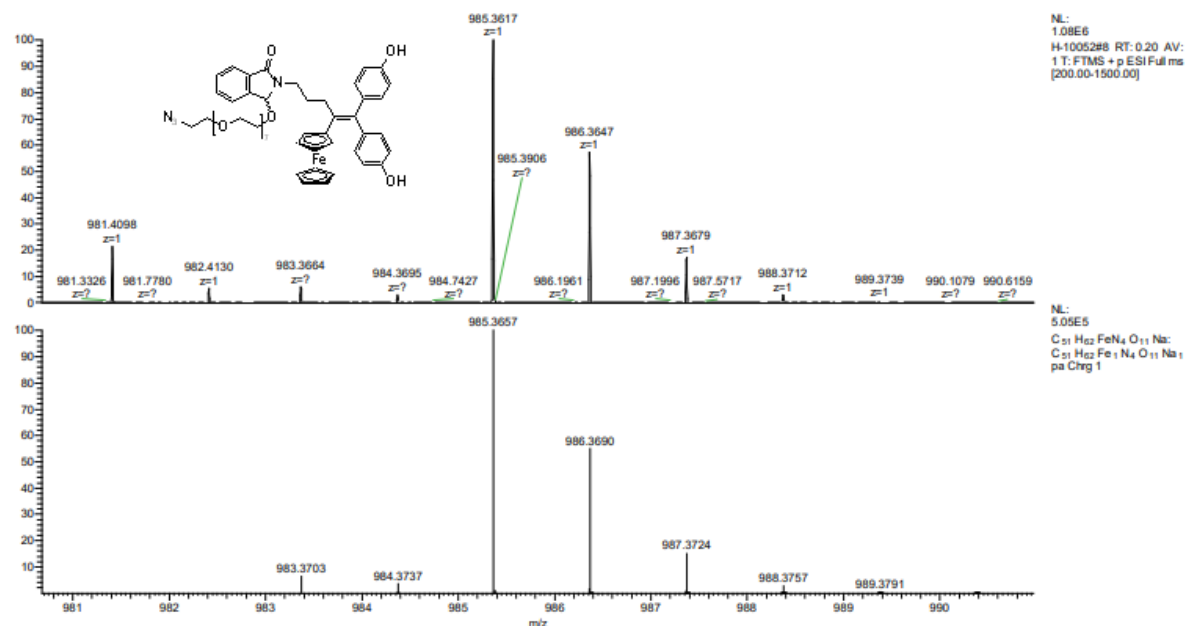




**Figure S46:**  $^1\text{H}$  (in  $\text{CDCl}_3$ ),  $^{13}\text{C}$  (in  $\text{CDCl}_3$ ), COSY (in  $\text{CDCl}_3$ ), HMQC (in  $\text{CDCl}_3$ ) NMR, HR-MS and IR data for compound **24**



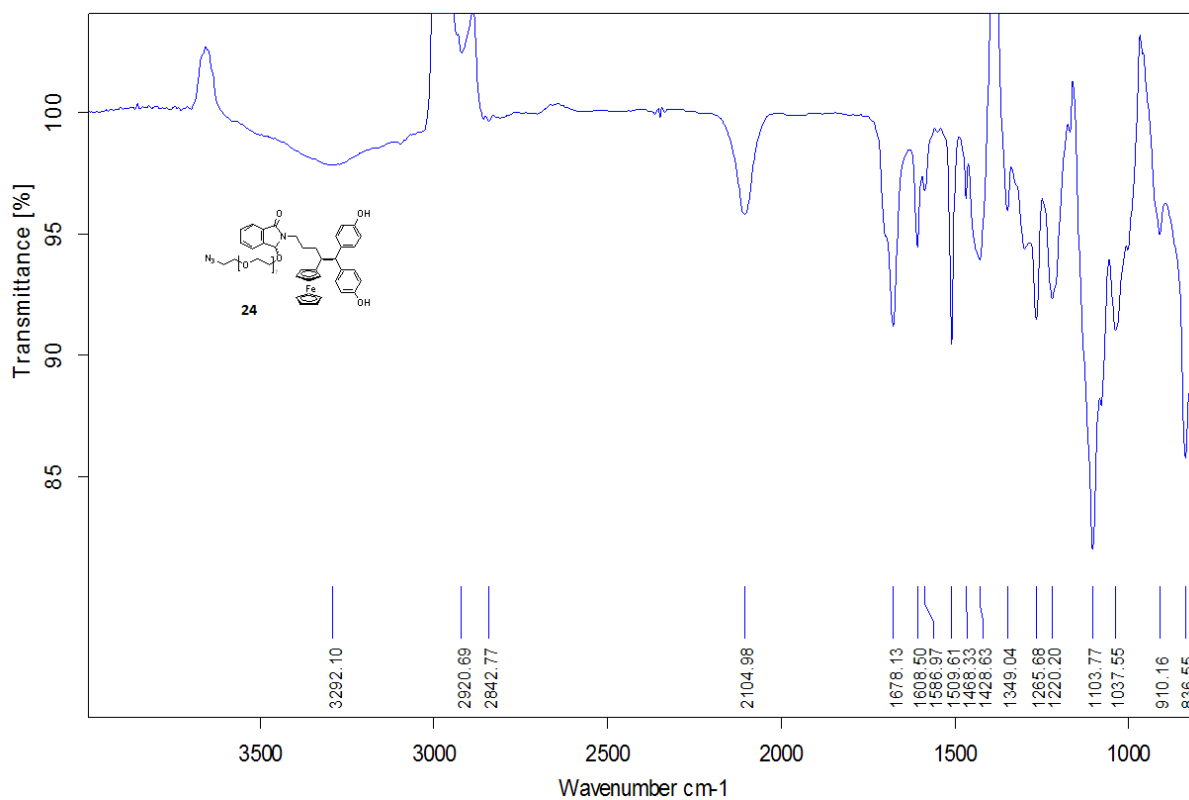




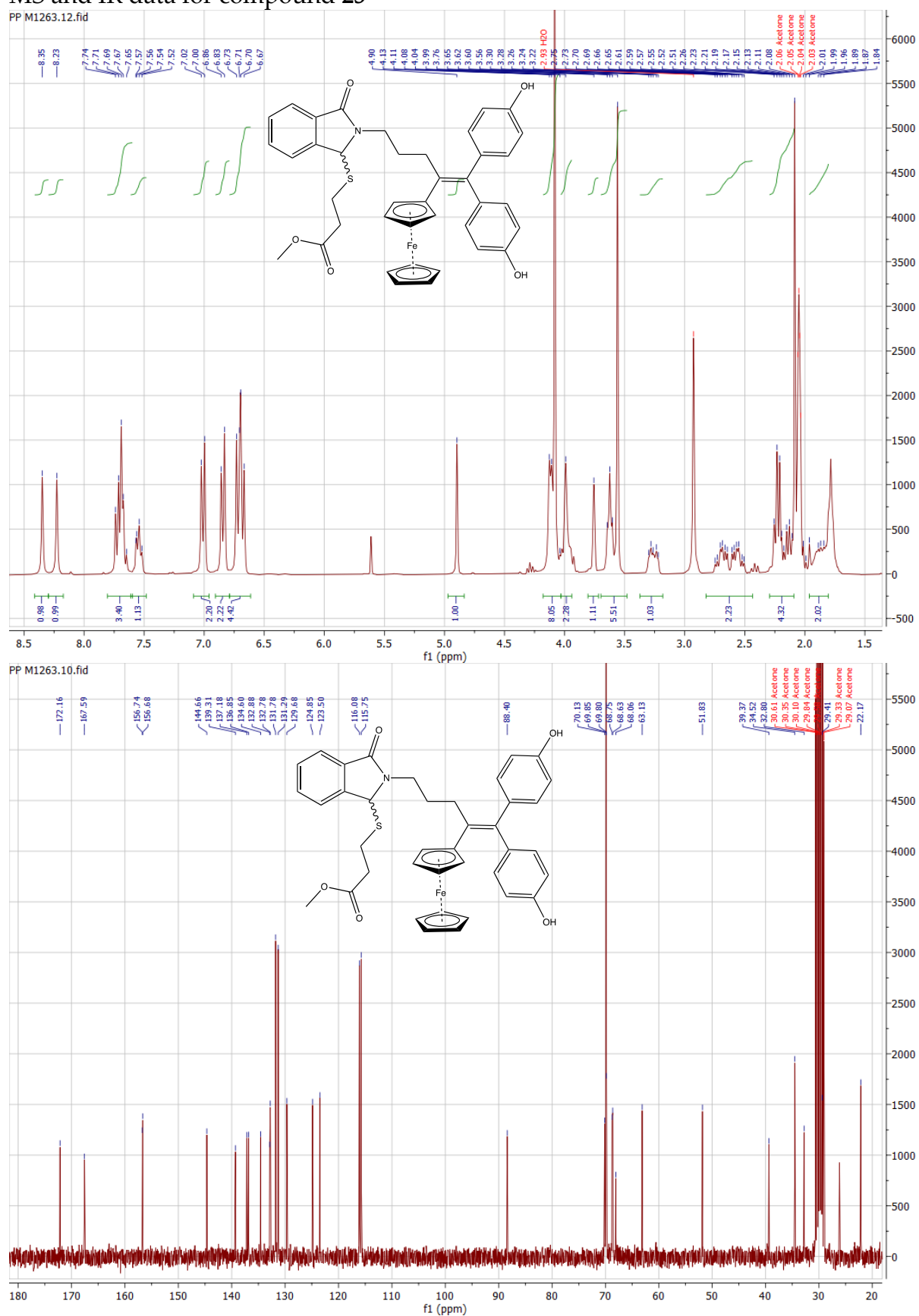
## Experimental/theoretical isotopic pattern MS spectrum

Error = -4.0 ppm; Relative Intensity (%) 100

HRMS m/z: [M+Na]<sup>+</sup> Calcd for C<sub>21</sub>H<sub>22</sub>FeN<sub>4</sub>O<sub>11</sub>Na 983.3703 Found 983.3664 ; (Error: -4.0 ppm).



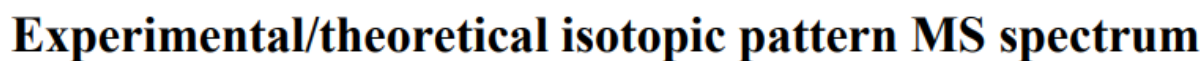
**Figure S47:**  $^1\text{H}$  (in acetone- $\text{d}_6$ ),  $^{13}\text{C}$  (in acetone- $\text{d}_6$ ), COSY (in acetone- $\text{d}_6$ ) NMR, HR-MS and IR data for compound **25**



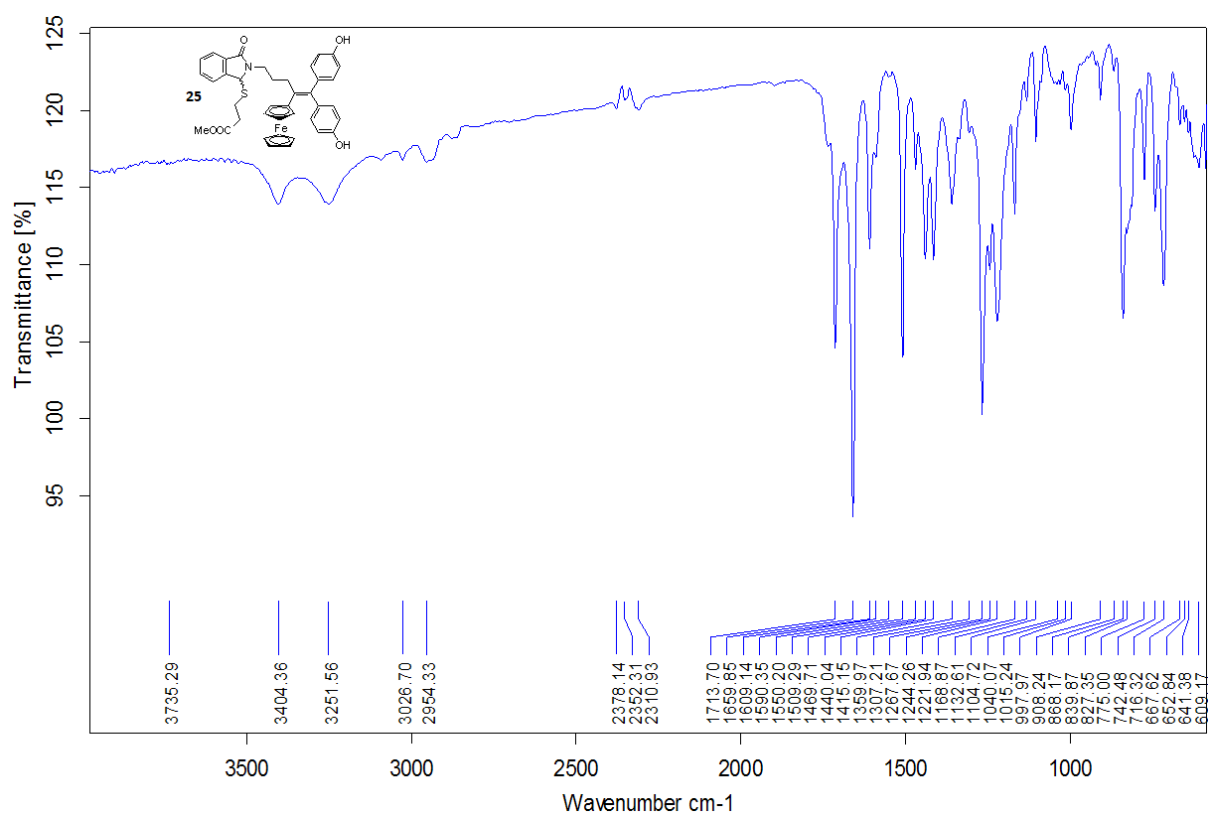


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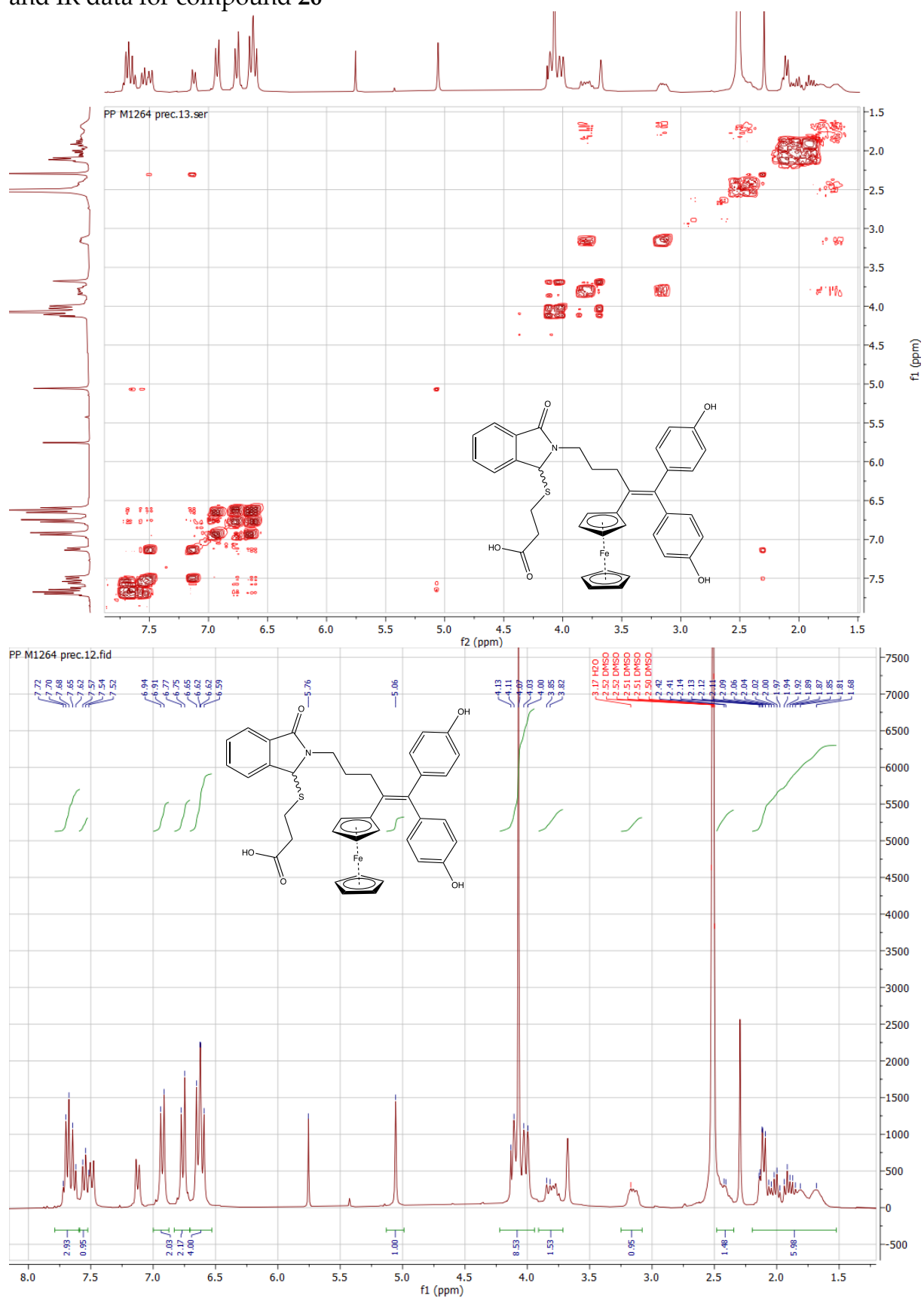
Pascal Pigeon P1000



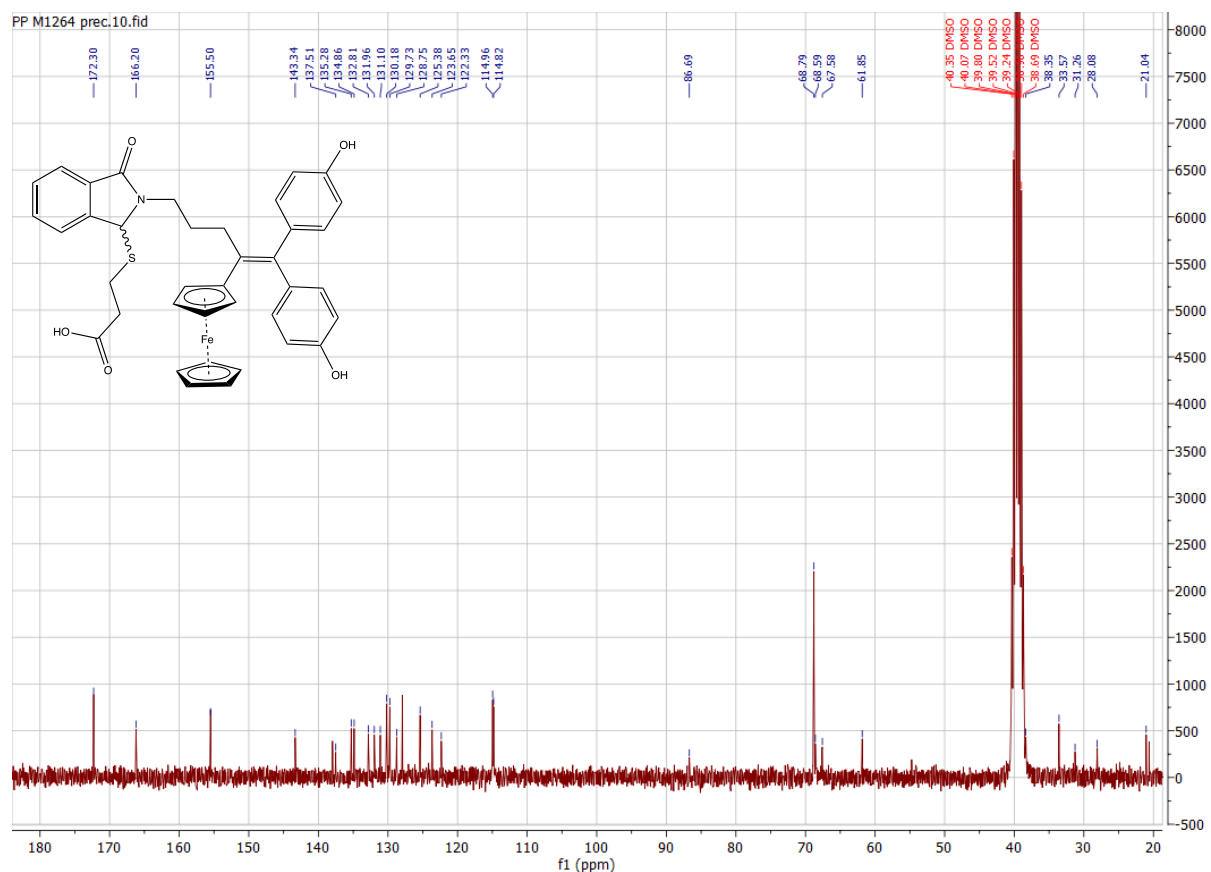
HRMS (ESI) m/z: [M]<sup>+</sup> Calcd for C<sub>39</sub>H<sub>37</sub>FeNO<sub>5</sub>S 687.1736 . Found 687.1736; (Error: 0.0 ppm).



**Figure S48:** COSY (in DMSO- $d_6$ ),  $^1\text{H}$  (in DMSO- $d_6$ ),  $^{13}\text{C}$  (in DMSO- $d_6$ ) NMR, HR-MS and IR data for compound **26**



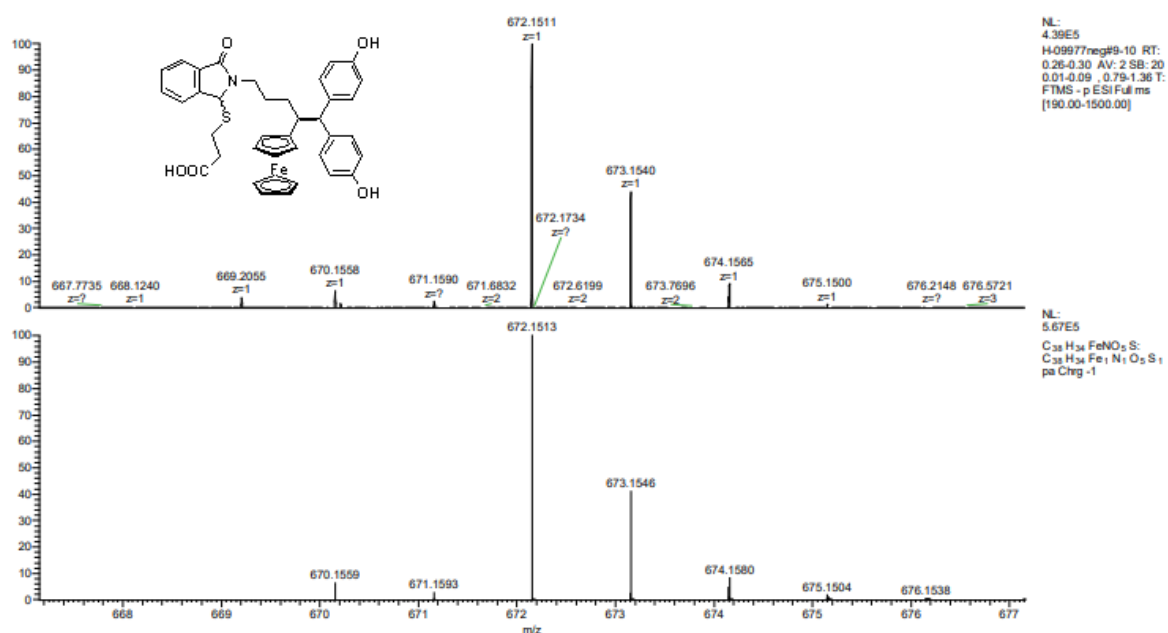




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MeOH

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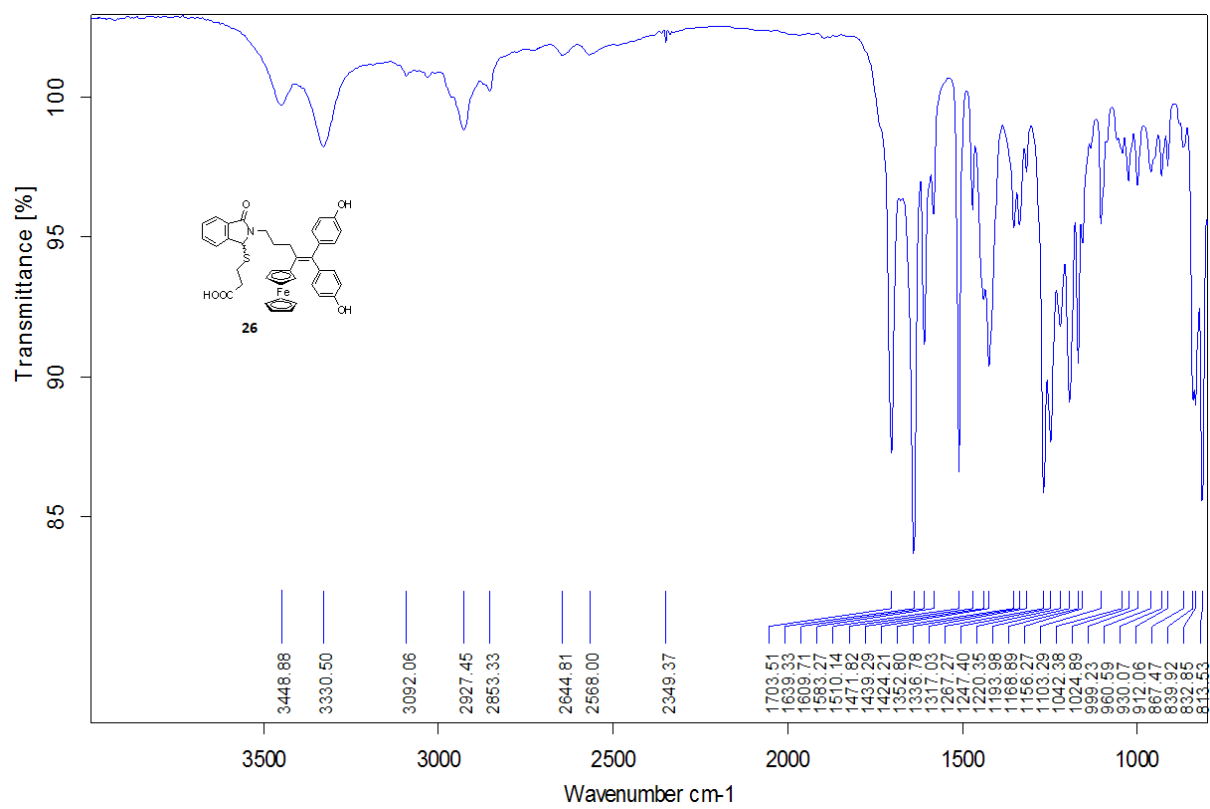
Pascal Pigeon P1001



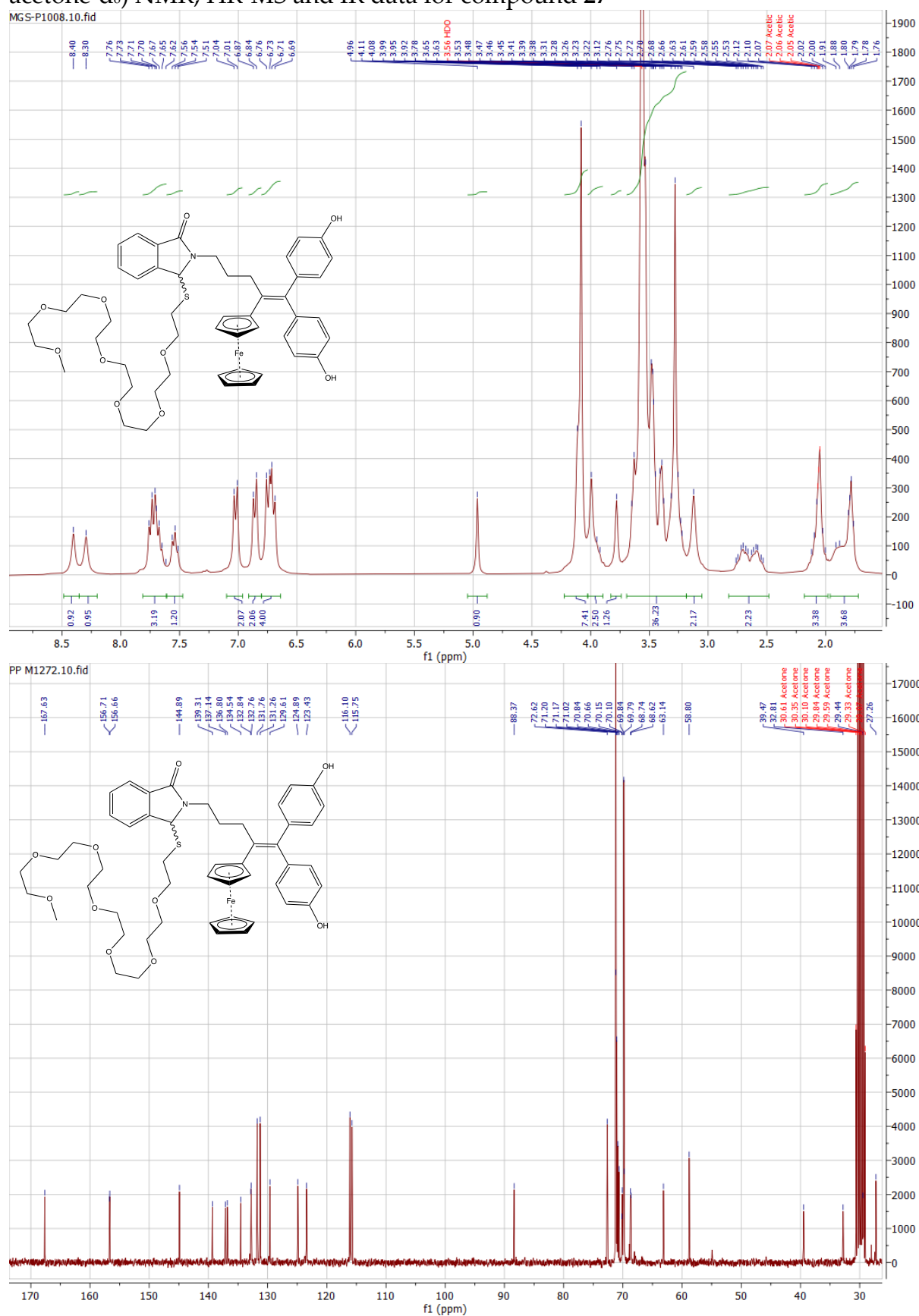
## Experimental/theoretical isotopic pattern MS spectrum

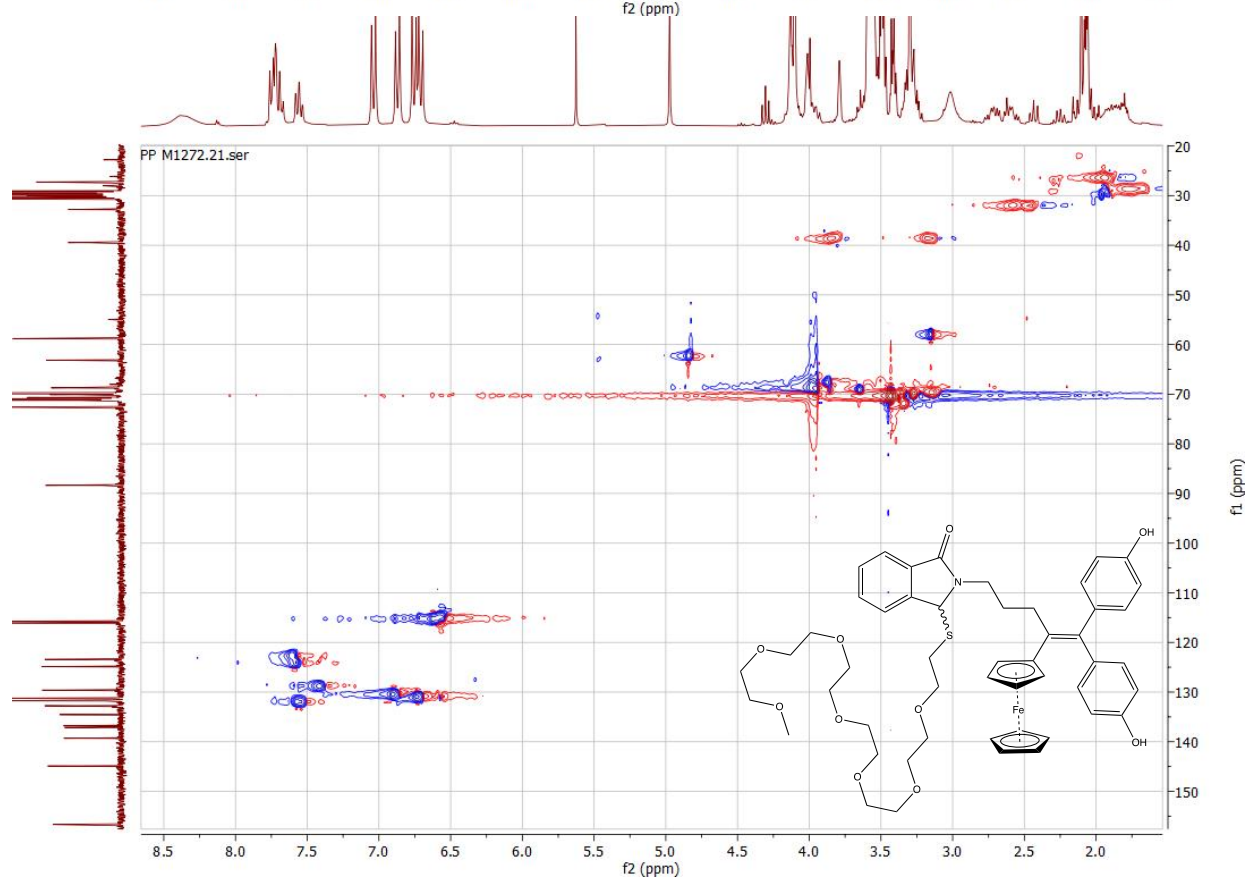
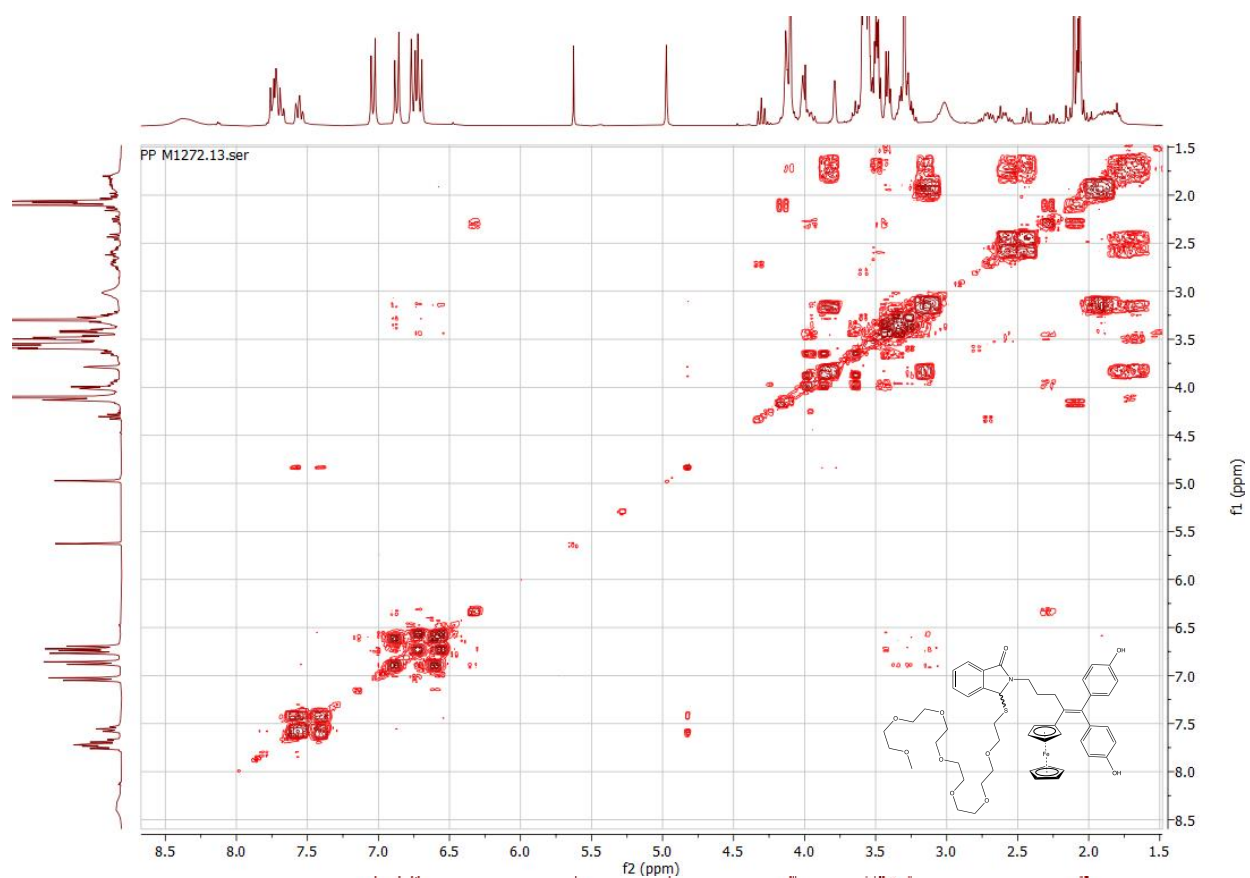
Error = -0.2 ppm; Relative Intensity (%) 100

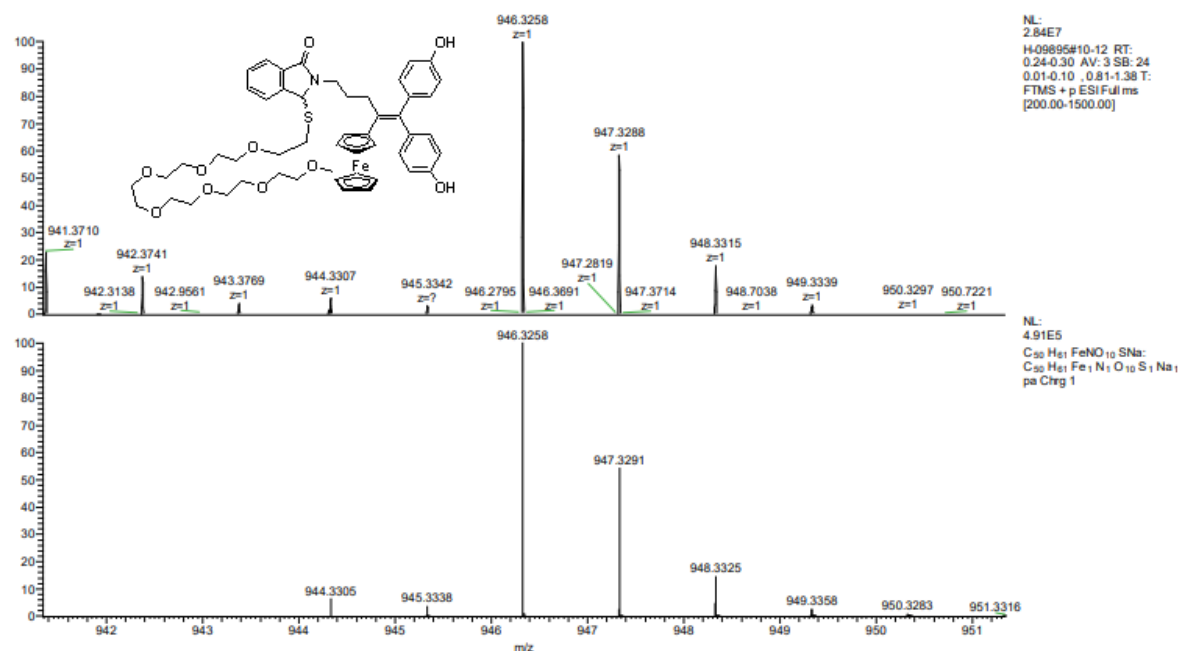
HRMS (ESI) m/z: [M] 1- Calcd for C<sub>38</sub>H<sub>34</sub>FeNO<sub>5</sub>S 672.1513 . Found 672.1511; (Error: -0.2 ppm).



**Figure S49:**  $^1\text{H}$  (in acetone- $d_6$ ),  $^{13}\text{C}$  (in acetone- $d_6$ ), COSY (in acetone- $d_6$ ), HMQC (in acetone- $d_6$ ) NMR, HR-MS and IR data for compound **27**



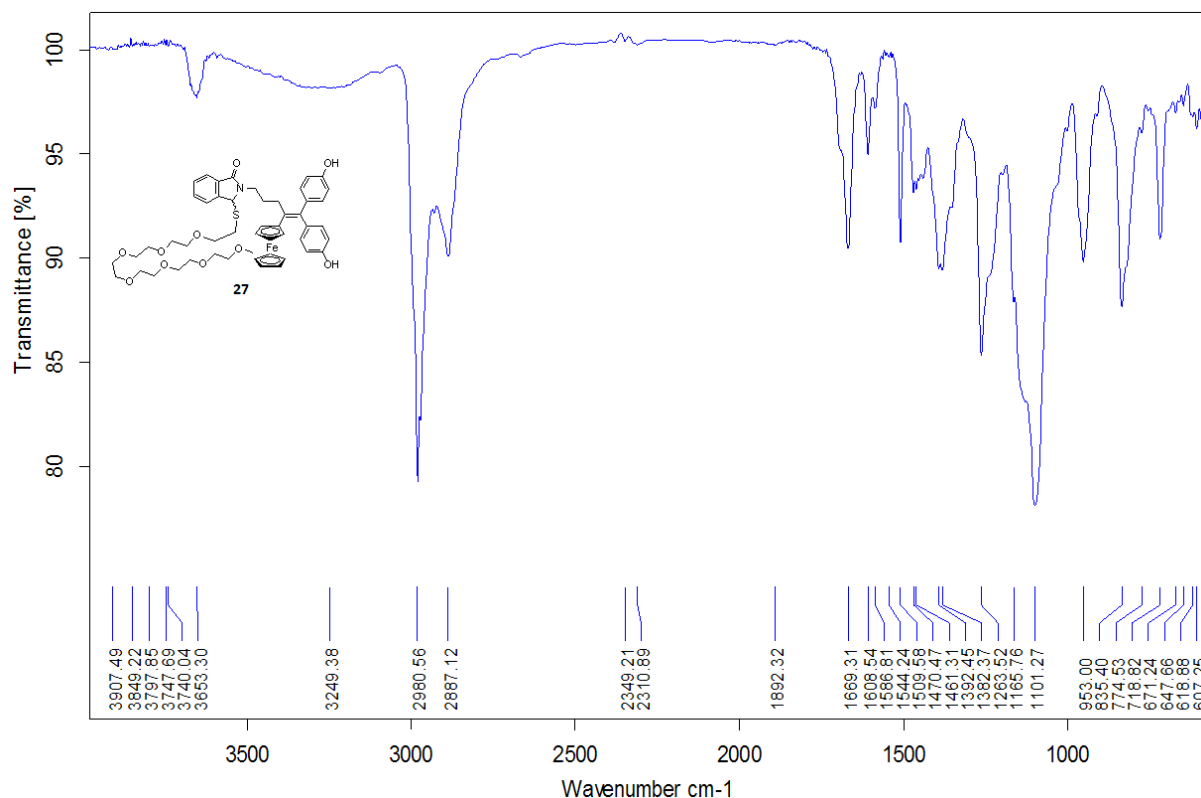




## Experimental/theoretical isotopic pattern MS spectrum

Error = 0.0 ppm; Relative Intensity (%) 100

HRMS (ESI)  $m/z$ :  $[M+Na]^+$  Calcd for  $C_{50}H_{61}FeNO_{10}SNa$  946.3258. Found 946.3258; (Error: 0.0 ppm).

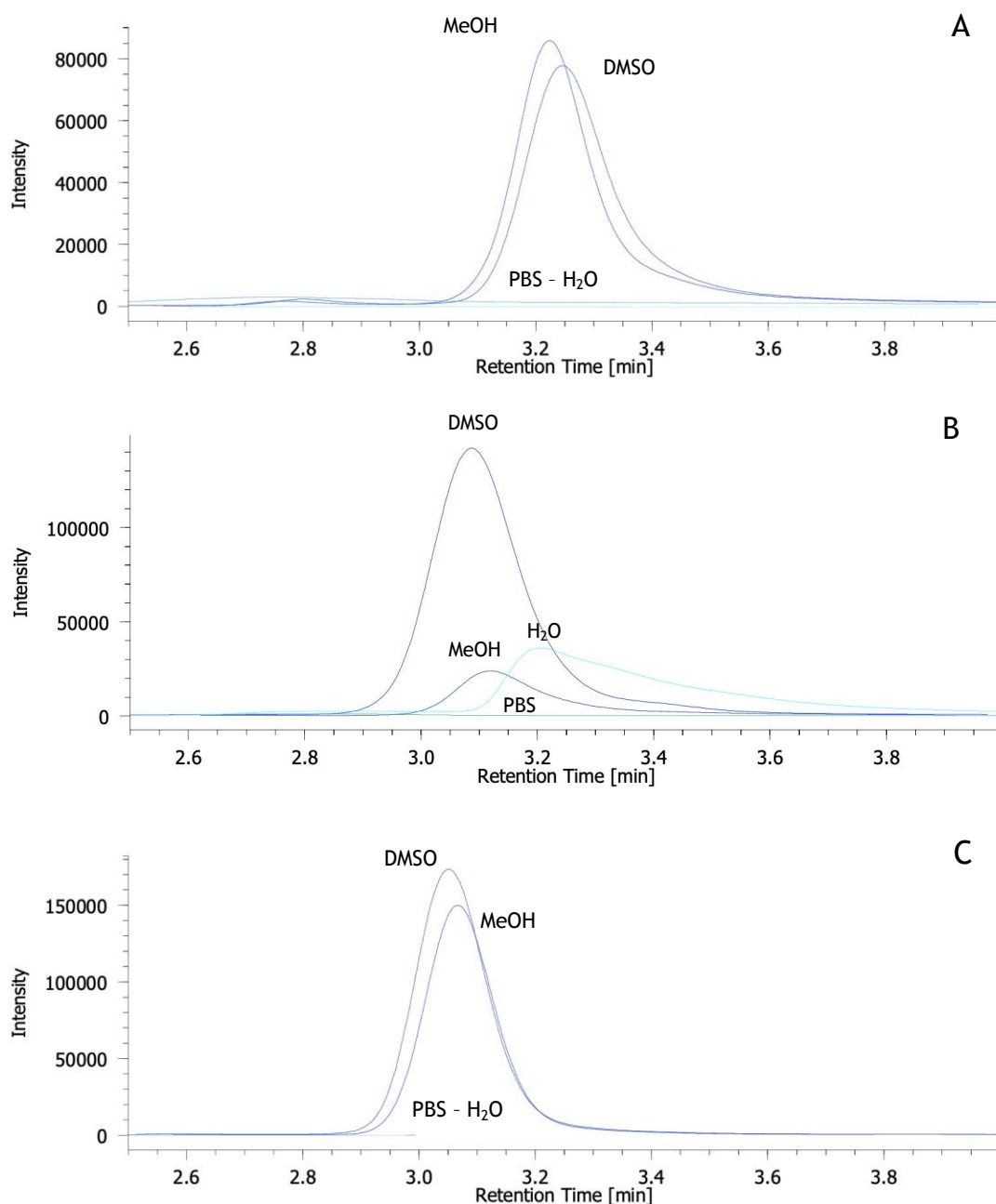


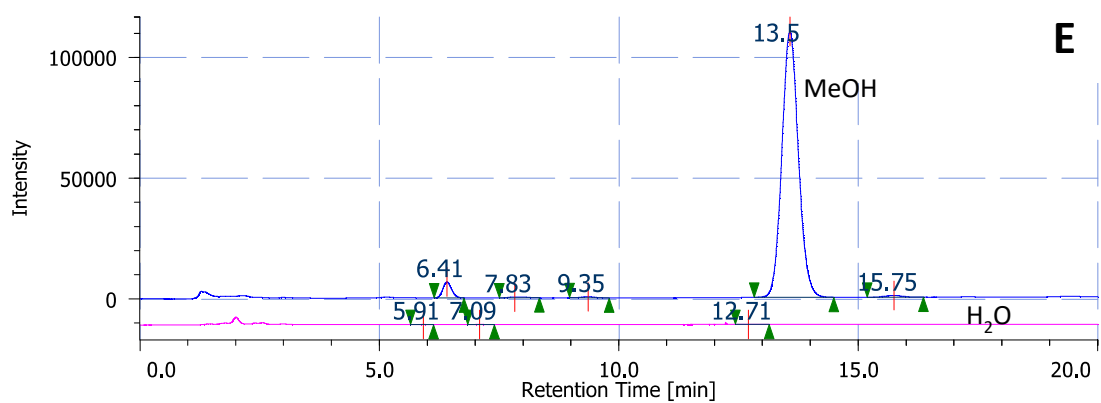
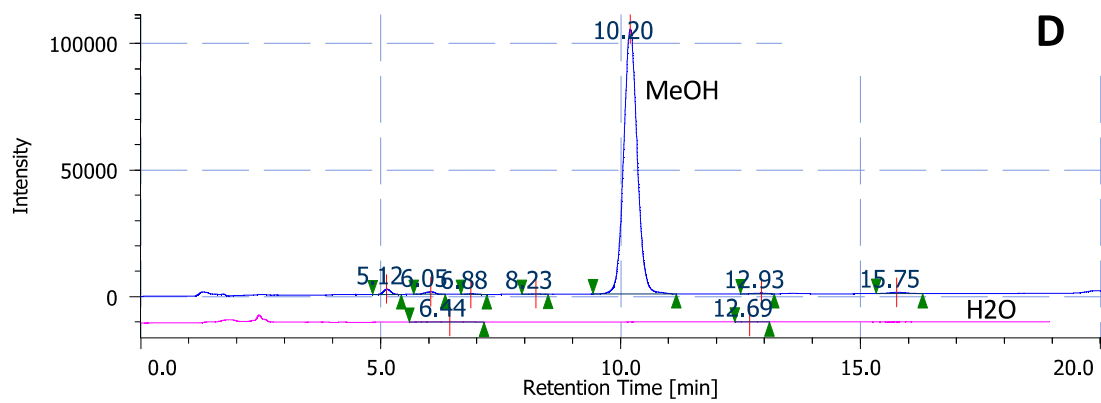
**Table S1.** Crystallographic data and structure refinement parameters for **15**, **23•acetone** and **25•acetone**.

Parameters	15	23•0.5acetone	25•acetone
Chemical formula	C <sub>16</sub> H <sub>17</sub> FeNO	C <sub>41.5</sub> H <sub>40</sub> FeNO <sub>4.5</sub>	C <sub>42</sub> H <sub>43</sub> FeNO <sub>6</sub> S
Formula weight (g.mol <sup>-1</sup> )	295.15	680.59	745.68
Crystal system	monoclinic	monoclinic	triclinic
Space group	P2 <sub>1</sub> /c	P2 <sub>1</sub> /n	P-1
Crystal size (mm <sup>3</sup> )	0.37 × 0.27 × 0.06	0.2 × 0.1 × 0.05	0.3 × 0.2 × 0.1
Crystal color and shape	Yellow prism	Orange prism	Orange plate
a (Å)	14.6466(7)	9.8118(3)	10.7220(5)
b (Å)	7.1923(3)	17.2893(6)	13.2436(6)
c (Å)	12.0545(6)	20.2760(6)	15.3329(6)
α (°)	90	90	97.196(3)
β (°)	94.662(4)	91.557(2)	103.916(4)
γ (°)	90	90	113.797(4)
Cell volume (Å <sup>3</sup> )	1265.65(10)	3438.33(19)	1872.10(16)
T (K)	200(1)	200(1)	200
Wavelength	1.54178	1.54178	0.71073
Z	4	4	2
Q <sub>calcd</sub> (g.cm <sup>-3</sup> )	1.549	1.315	1.323
μ (mm <sup>-1</sup> )	9.458	3.874	0.507
Scan range (°)	6.063 < θ < 66.571	4.37 < θ < 66.47	1.9360 < θ < 32.2830
Index ranges	-17 ≤ h ≤ 16 -5 ≤ k ≤ 8 -14 ≤ l ≤ 14	-11 ≤ h ≤ 10 -20 ≤ k ≤ 20 -24 ≤ l ≤ 21	-14 ≤ h ≤ 14 -17 ≤ k ≤ 17 -20 ≤ l ≤ 20
Reflections (all / independent)	9310 / 2242	26640 / 6066	25312 / 9219
Completeness (%)	99.9	99.8	99.3
R <sub>int</sub>	0.0471	0.0505	0.0892
Data / parameters / restraints	2242 / 173 / 0	6066 / 455 / 27	9219 / 471 / 0
Goodness-of-fit on F <sup>2</sup>	1.025	1.031	1.102
R1 [I > 2σ(I)] (%)	3.50	3.82	6.30
wR2 (all data) (%)	9.04	9.82	16.76
Largest difference peak and hole (Å <sup>-3</sup> )	0.247, -0.290	0.265, -0.341	1.517, -0.588

**Figure S50:** Solubility studies by RP-HPLC analysis of compounds **18** (A), **20** (B) and **22** (C), **24** (D) and **27** (E)

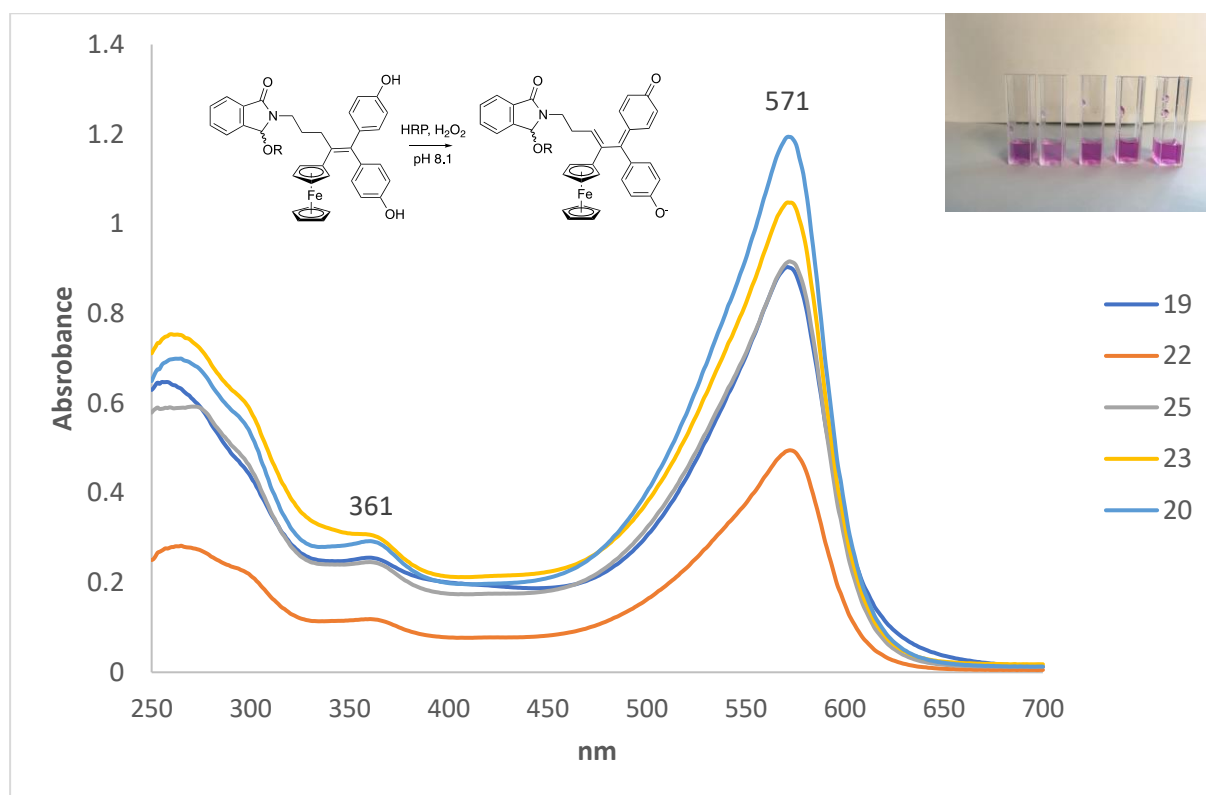
A given amount of compounds **18**, **20** and **22** was weighted and suspended in a given volume of tested solvent (DMSO, MeOH, PBS and H<sub>2</sub>O) to reach a theoretical concentration of 1 mM. Suspensions were sonicated for 1 min and shaken at R.T. for 18 h. The resulting solutions were filtrated (pore size 0.2  $\mu$ m) and diluted to 100  $\mu$ M in MeCN (for the solutions in organic solvents). HPLC analysis was performed on Nucleodur C18 column, (100 Å, 5  $\mu$ m, 4.6 x 150 mm, Macherey-Nagel) using MeCN/H<sub>2</sub>O 65:35 at 1 mL/min with detection at 302 nm (**18**, **20** and **22**) or MeCN/H<sub>2</sub>O 55:45 at 1 mL/min with detection at 254 nm (**24** and **27**).



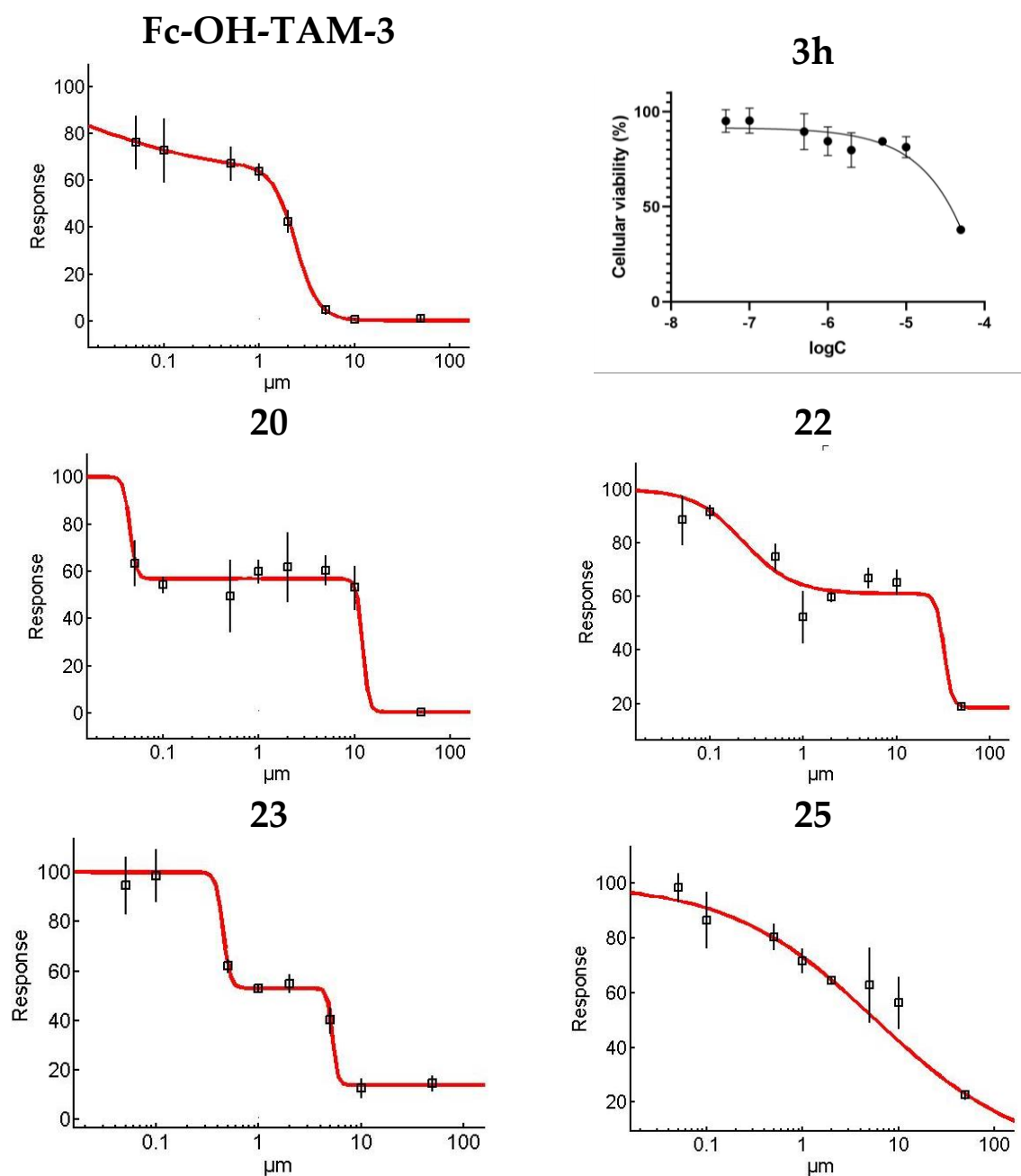




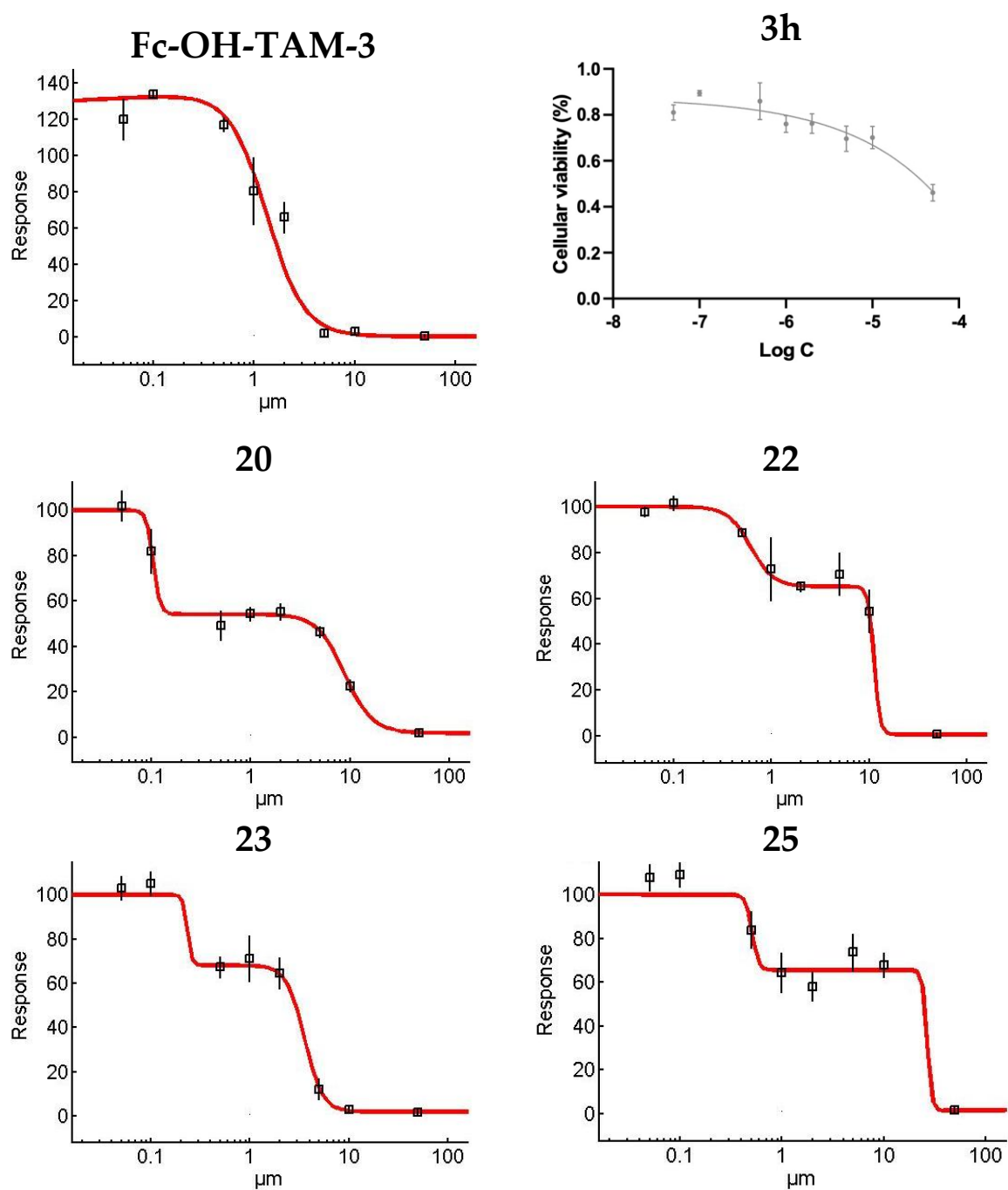
**Figure S51.** UV-vis spectra of compounds **19**, **20**, **22**, **23** and **25** (50  $\mu$ M) treated by HRP (46 nM) and H<sub>2</sub>O<sub>2</sub> (200  $\mu$ M) in 0.2 M TRIS buffer pH 8.1. Conversion to the phenolate form of the quinone methides is assessed by the appearance of the characteristic bands at ca. 570 and 360 nm.



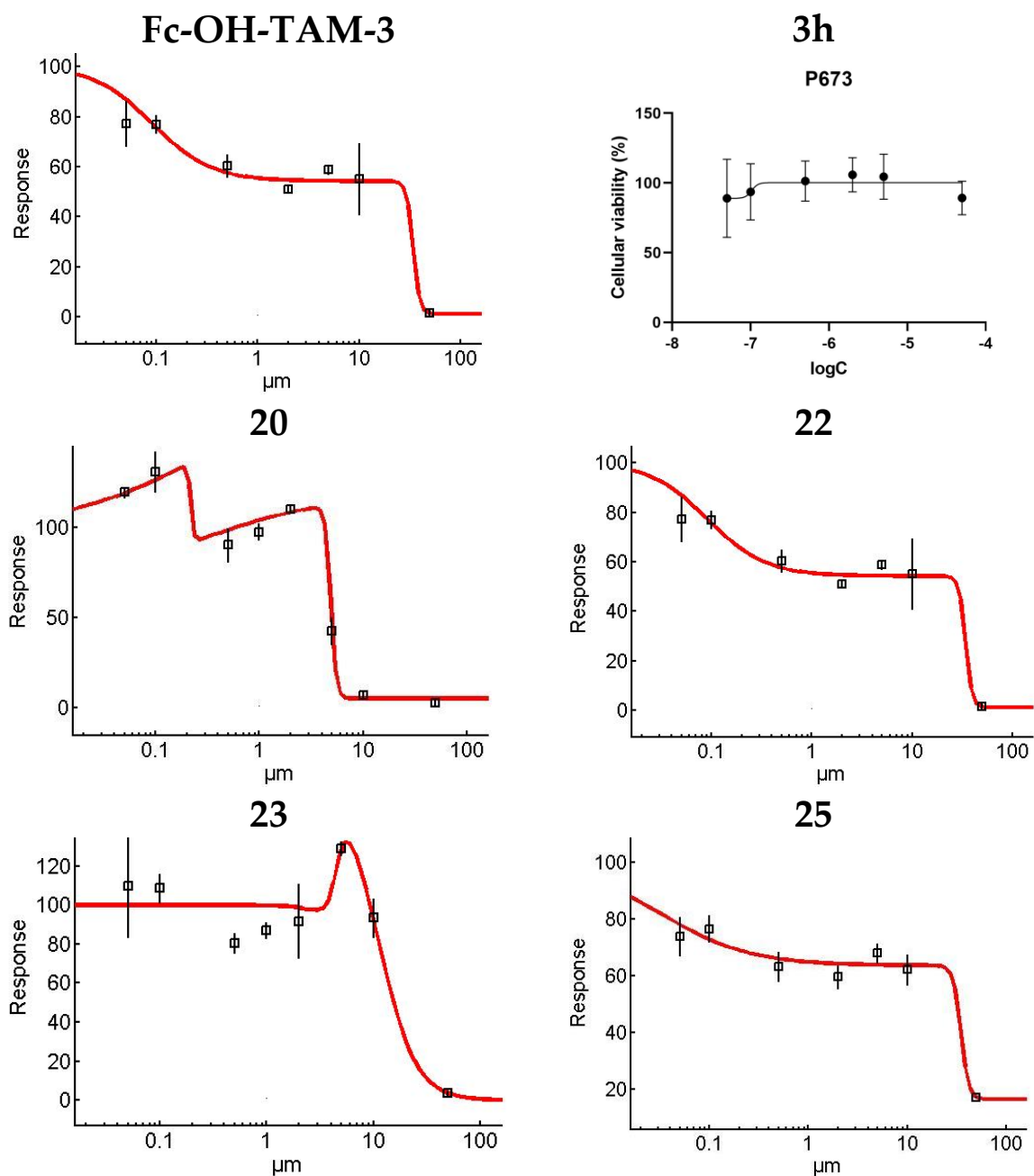
**Figure S52:** MTT cell viability assay for compounds **Fc-OH-TAM-3**, **3h**, **20**, **22**, **23** and **25**.



**A:** Fitting of dose-response curves for compounds **Fc-OH-TAM-3**, **3h**, **20**, **22**, **23**, **25** on MCF-7 cells using Dr-Fit Software (Di Veroli et al. Sci. Rep. 2015, 5, 14701) or GraphPad Prism.

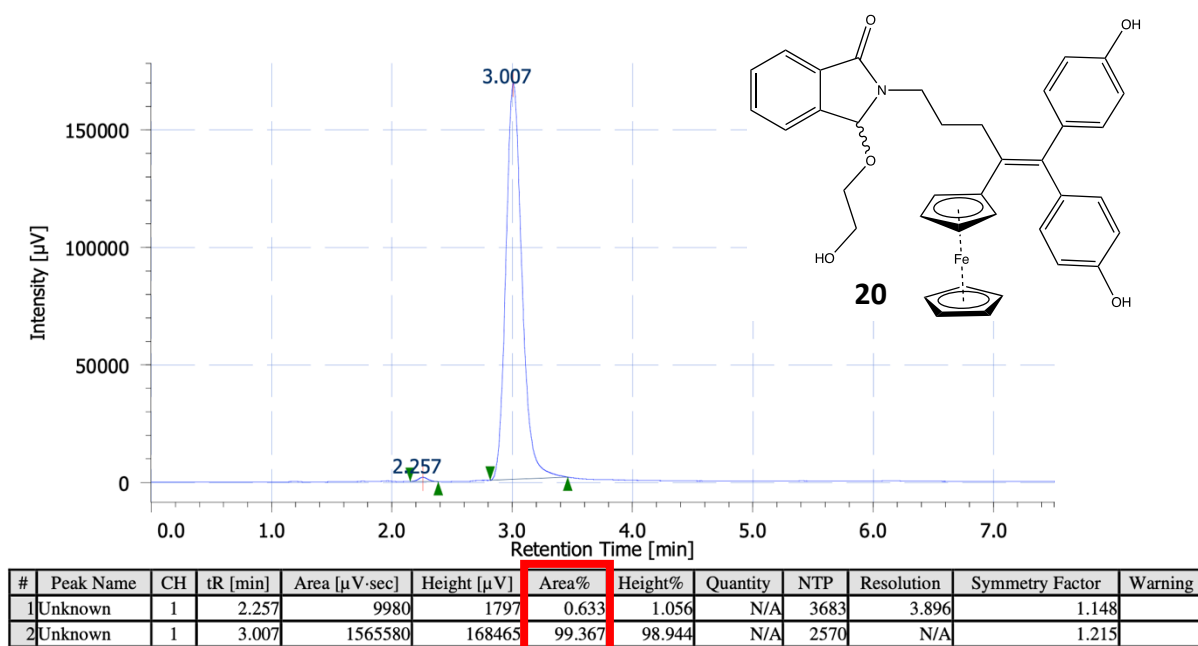
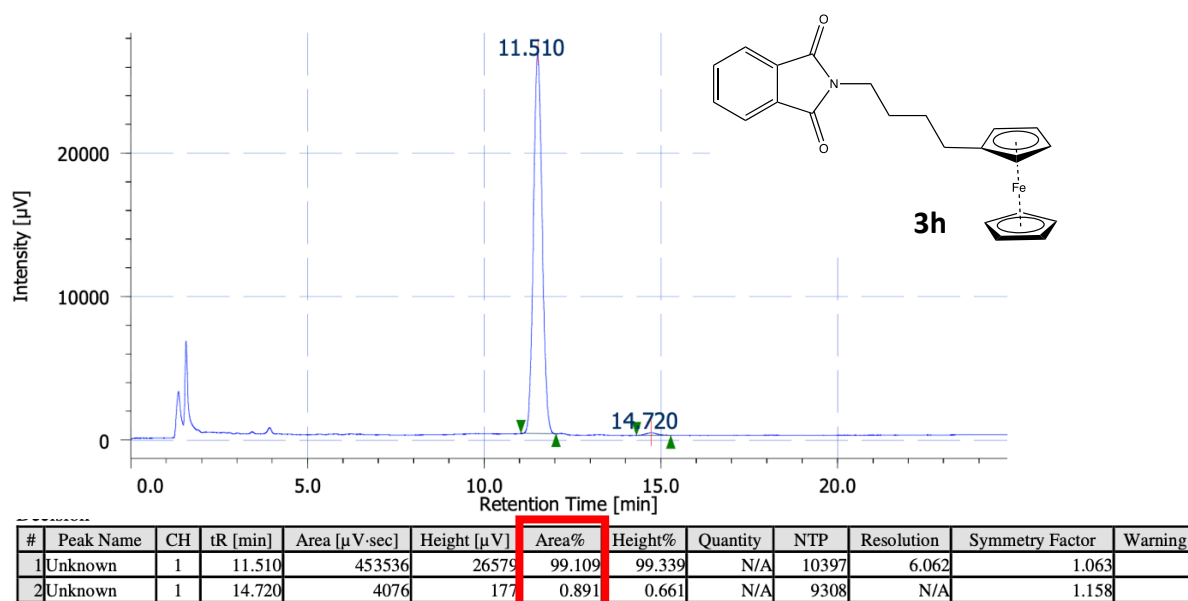


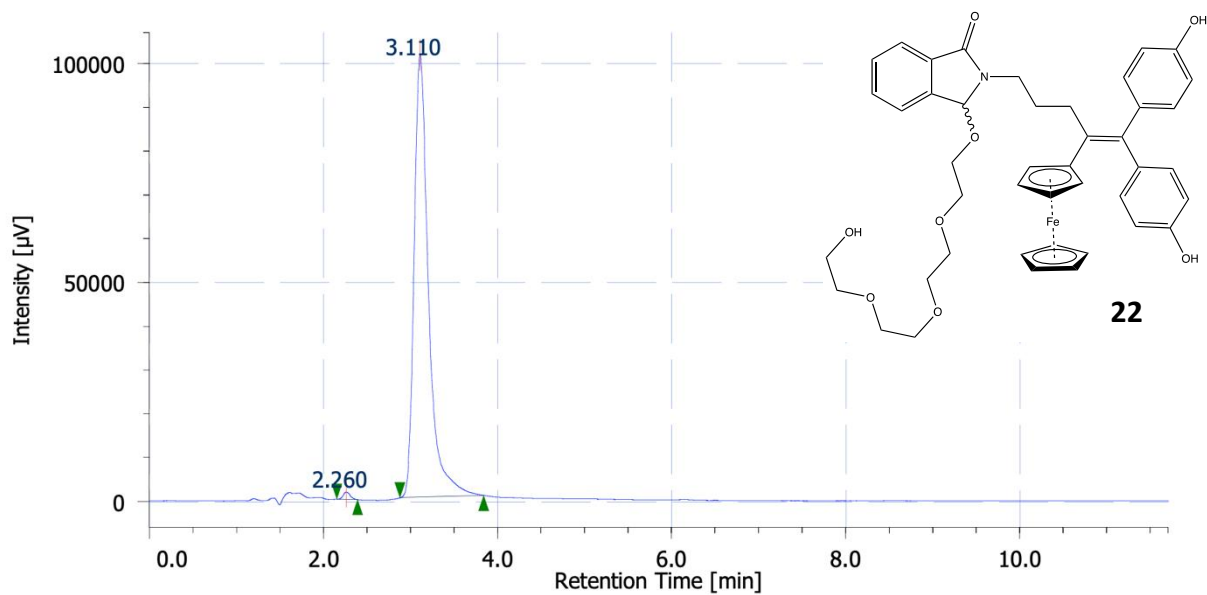
**B:** Fitting of dose-response curves for compounds **Fc-OH-TAM-3**, **3h**, **20**, **22**, **23**, **25** on MDA-MB-231 cells using Dr-Fit Software (Di Veroli et al. Sci. Rep. 2015, 5, 14701) or GraphPad Prism.



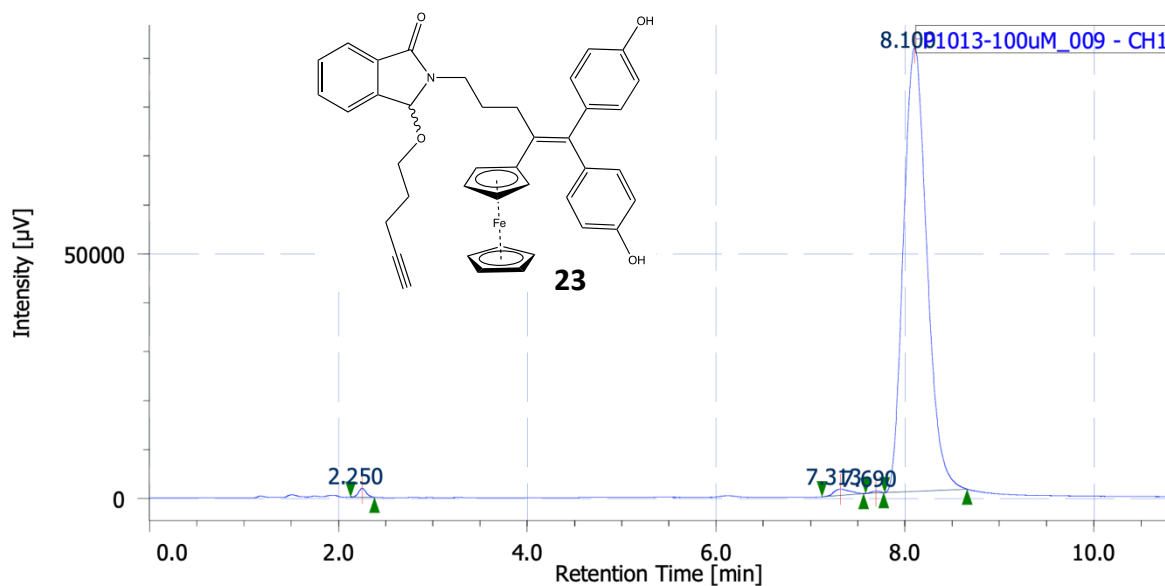
**B:** Fitting of dose-response curves for compounds **Fc-OH-TAM-3**, **3h**, **20**, **22**, **23**, **25** on hTERT-RPE1 cells using Dr-Fit Software (Di Veroli et al. Sci. Rep. 2015, 5, 14701) or GraphPad Prism.

**Figure S53:** HPLC traces for compounds **3h**, **20**, **22**, **23** and **25** (100  $\mu$ M, acetonitrile, DMSO 1%; method loaded for all with acetonitrile/H<sub>2</sub>O = 65/35, except **3h** with acetonitrile/H<sub>2</sub>O = 75/25)

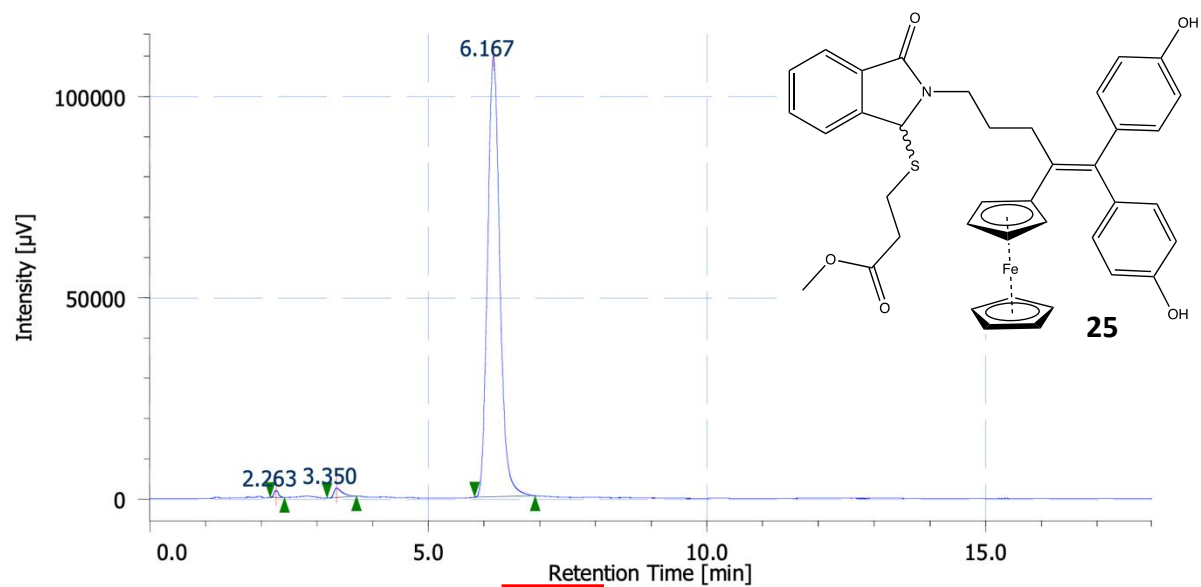




#	Peak Name	CH	tR [min]	Area [μV·sec]	Height [μV]	Area%	Height%	Quantity	NTP	Resolution	Symmetry Factor	Warning
1	Unknown	1	2.260	9469	1713	0.810	1.668	N/A	3750	4.004	1.192	
2	Unknown	1	3.110	1159459	100965	99.190	98.332	N/A	2002	N/A	1.539	



#	Peak Name	CH	tR [min]	Area [μV·sec]	Height [μV]	Area%	Height%	Quantity	NTP	Resolution	Symmetry Factor	Warning
1	Unknown	1	2.250	10286	1824	0.648	1.937	N/A	3652	21.801	1.126	
2	Unknown	1	7.313	15061	1291	0.948	1.370	N/A	8525	1.527	1.298	
3	Unknown	1	7.690	2309	373	0.145	0.396	N/A	29899	1.299	0.922	
4	Unknown	1	8.100	1560587	90692	98.259	96.297	N/A	5075	N/A	1.192	



#	Peak Name	CH	tR [min]	Area [μV-sec]	Height [μV]	Area%	Height%	Quantity	NTP	Resolution	Symmetry Factor	Warning
1	Unknown	1	2.263	10131	180	0.594	1.588	N/A	3633	5.208	1.143	
2	Unknown	1	3.350	24972	232	1.465	2.046	N/A	2496	8.525	2.107	
3	Unknown	1	6.167	1669127	10942	97.940	96.366	N/A	3912	N/A	1.148	