

Bronsted Acid Mediated Facile Greener Multicomponent Synthesis of 2,4-Diaryl-quinoline Derivatives in Water

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Contents

S1	¹ H and ¹³ C spectrum of compounds
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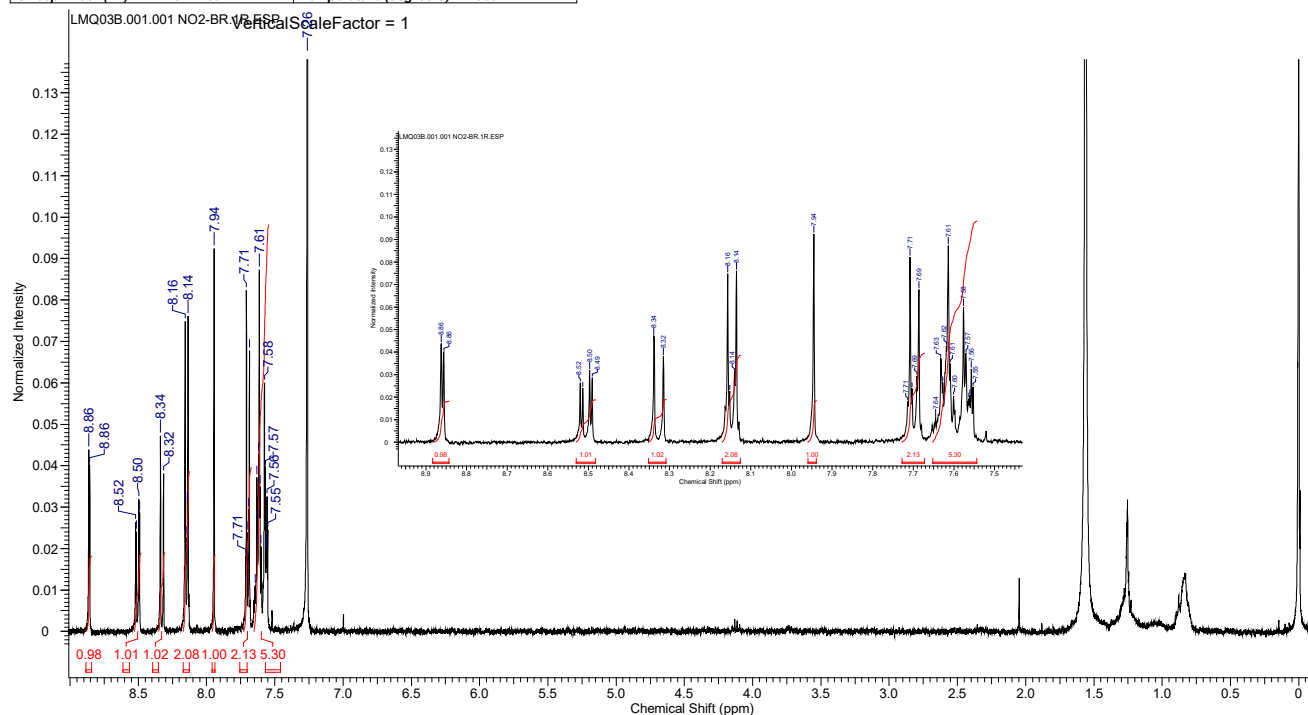
Supporting Information for:

S1. ^1H and ^{13}C spectrum of compounds

2-(4-bromophenyl)-6-nitro-4-phenylquinoline (7aa):

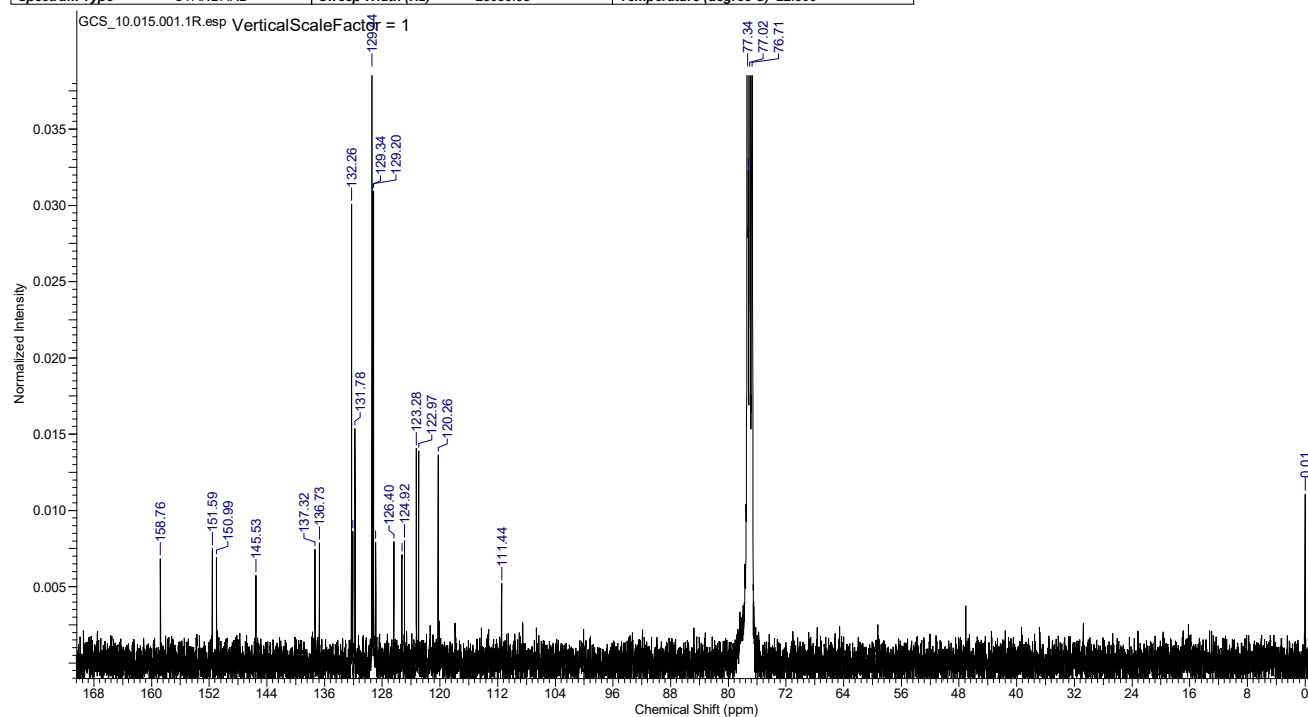
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Acquisition Time (sec)	3.9584	Comment	PROTON CDCl ₃ (C:\Bruker\TOPSPIN)\csf 49	
Nucleus	^1H	Number of Transients	16	Frequency (MHz)
Owner	nmrsu	Points Count	32768	Origin
SW(cyclical) (Hz)	8278.15	Solvent	CHLOROFORM-d	Pulse Sequence
Sweep Width (Hz)	8277.89	Temperature (degree C)	27.000	Spectrum Offset (Hz)
				Receiver Gain
				Spectrum Type



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Acquisition Time (sec)	1.3664	
Frequency (MHz)	100.61	Nucleus
Original Points Count	32768	Owner
Receiver Gain	4096.00	SW(cyclical) (Hz)
Spectrum Type	STANDARD	Temperature (degree C)
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		Points Count
		Solvent
		Spectrum Offset (Hz)

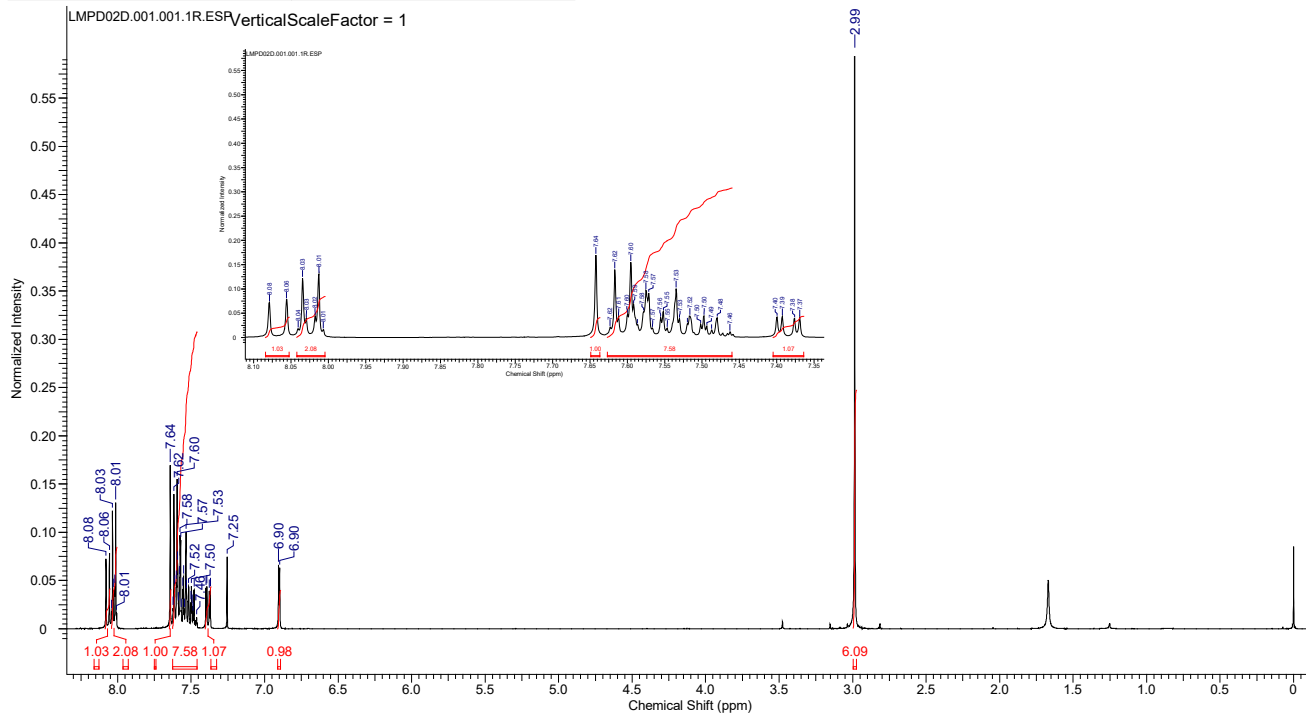


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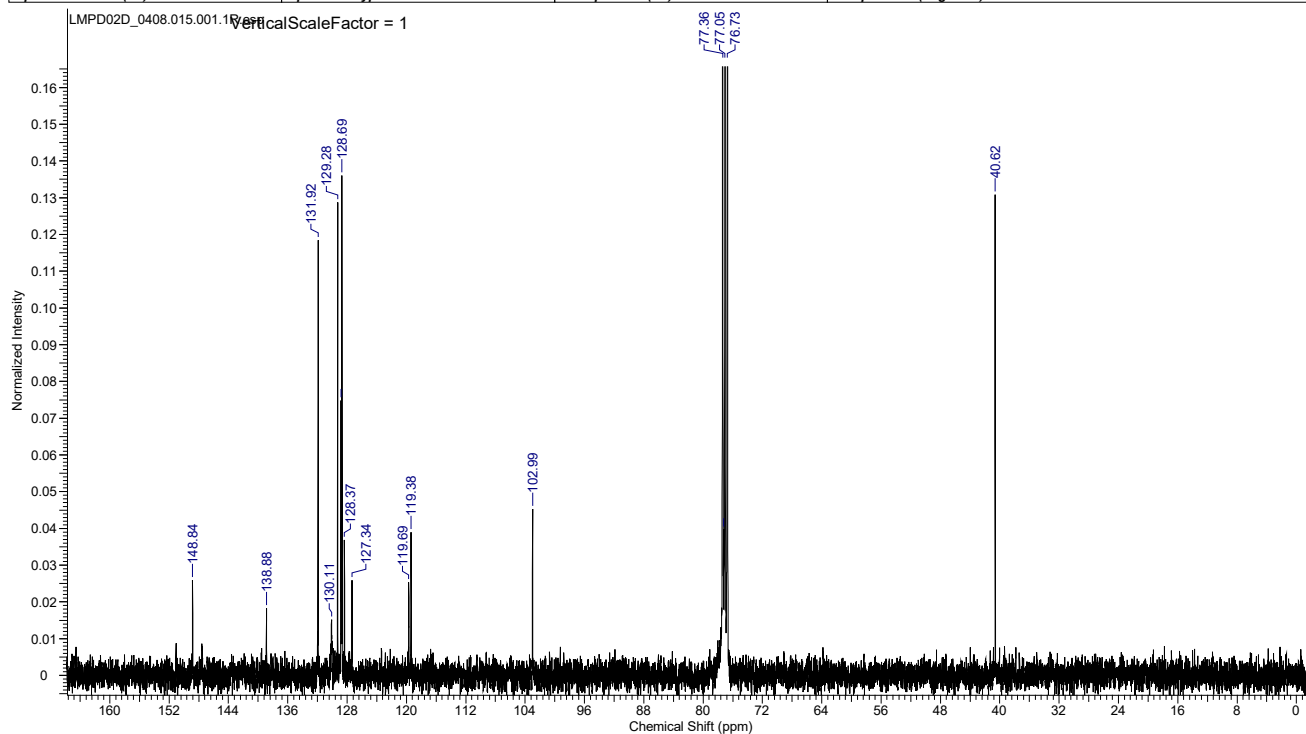
2-(4-bromophenyl)-N,N-dimethyl-4-phenylquinolin-6-amine (7ba):

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Acquisition Time (sec)	3.9584				
Nucleus	1H	Number of Transients	16	Origin	spect
Owner	nmrsu	Points Count	32768	Pulse Sequence	zg30
SW(cyclical) (Hz)	8278.15	Solvent	CHLOROFORM-d	Spectrum Offset (Hz)	2458.1665
Sweep Width (Hz)	8277.89	Temperature (degree C)	27.000	Spectrum Type	STANDARD

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Acquisition Time (sec)	1.3664				
Frequency (MHz)	100.61	Nucleus	13C	Number of Transients	2048
Original Points Count	32768	Owner	nmrsu	Points Count	32768
Receiver Gain	5160.60	SW(cyclical) (Hz)	23980.81	Solvent	CHLOROFORM-d
Spectrum Offset (Hz)	10060.8027	Spectrum Type	STANDARD	Sweep Width (Hz)	23980.08
				Temperature (degree C)	27.000

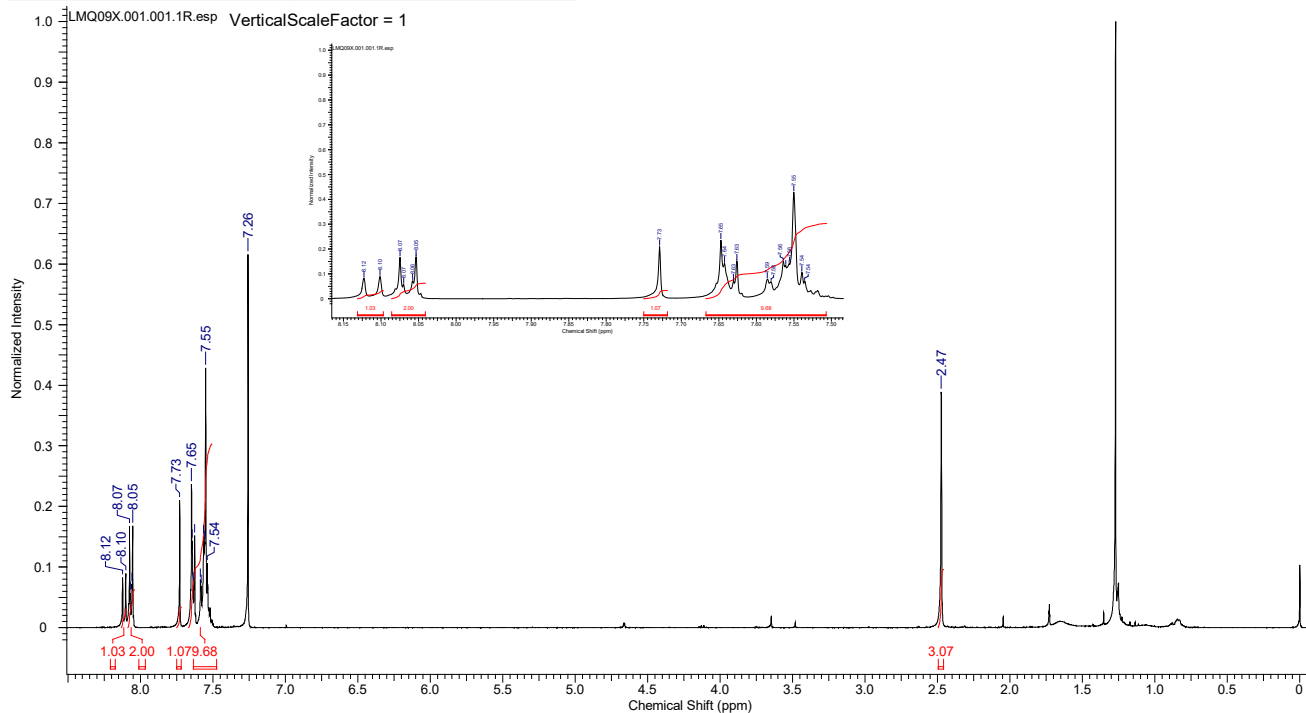


Supporting Information for:

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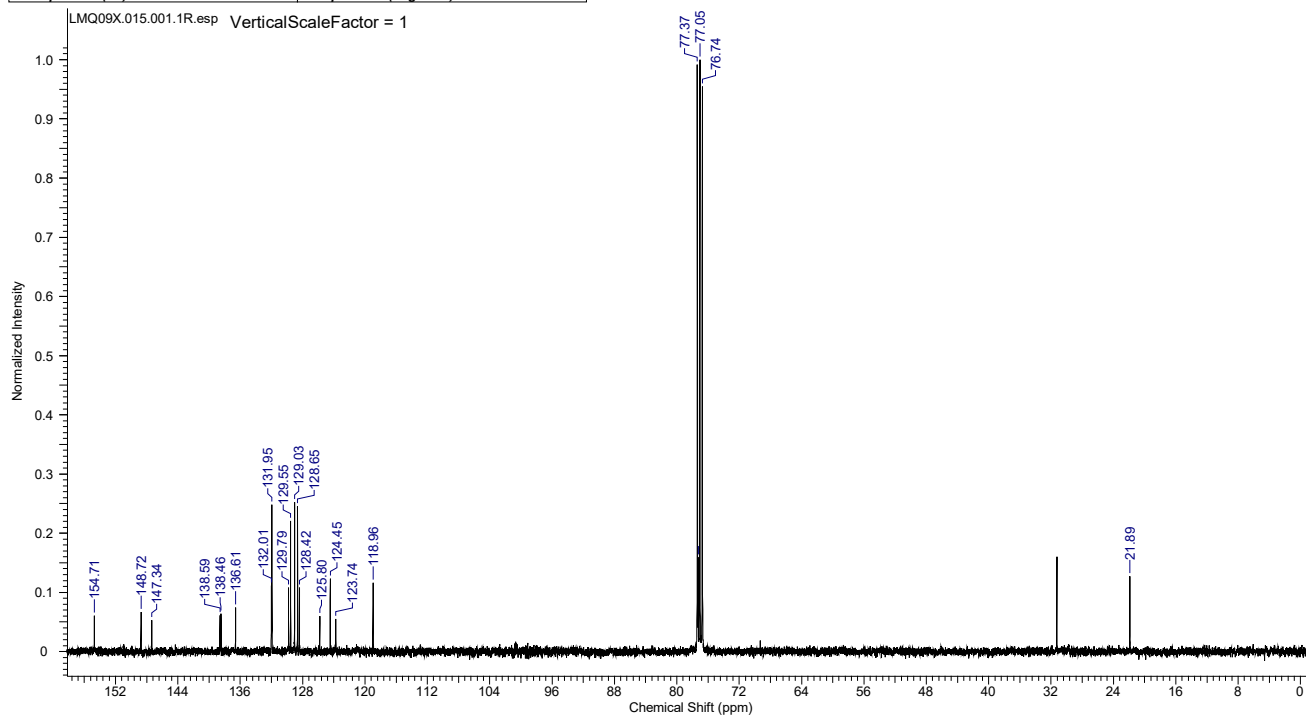
This report was created by ACD/NMR Processor Academic Edition. For more information go to www.acdlabs.com/nmrproc/

Acquisition Time (sec)	3.9584				
Nucleus	¹ H	Number of Transients	16	Origin	spect
Owner	nmrsu	Points Count	32768	Pulse Sequence	zg30
SW(cyclical) (Hz)	8278.15	Solvent	CHLOROFORM-d	Receiver Gain	6502.00
Sweep Width (Hz)	8277.89	Temperature (degree C)	27.000	Spectrum Offset (Hz)	2459.3191
				Spectrum Type	STANDARD



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Acquisition Time (sec)	1.3664				
Nucleus	¹³ C	Number of Transients	1024	Origin	spect
Owner	nmrsu	Points Count	32768	Pulse Sequence	zgpg30
SW(cyclical) (Hz)	23980.81	Solvent	CHLOROFORM-d	Receiver Gain	1625.50
Sweep Width (Hz)	23980.08	Temperature (degree C)	27.000	Spectrum Offset (Hz)	10060.8027
				Spectrum Type	STANDARD

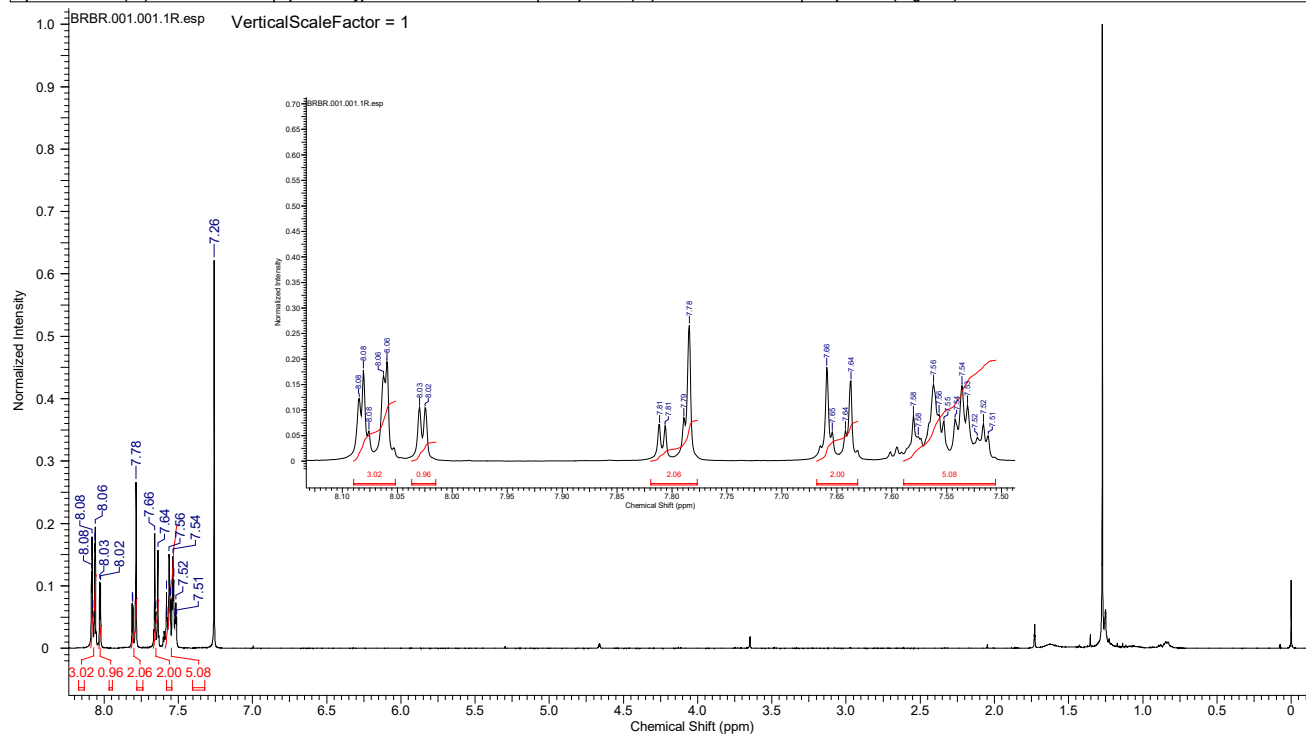


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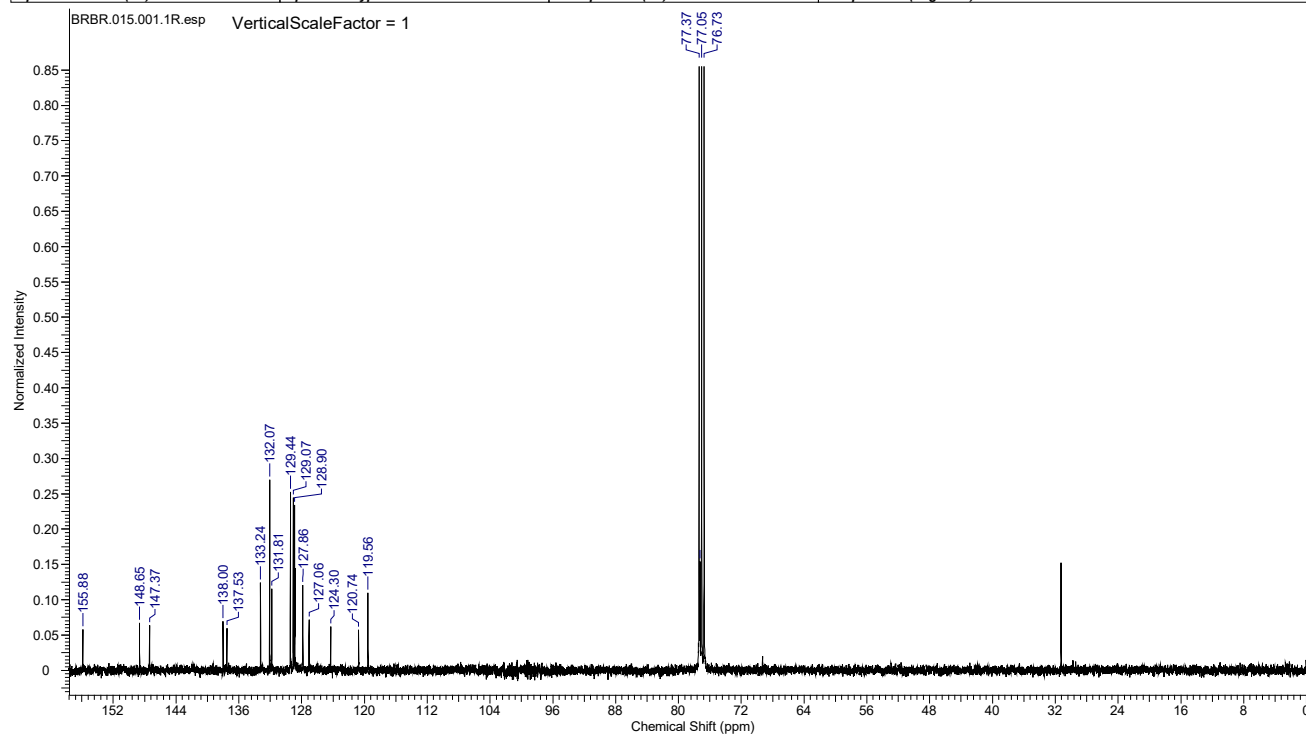
6-bromo-2-(4-bromophenyl)-4-phenylquinoline (7da):

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Acquisition Time (sec)		3.9584					
Frequency (MHz)	400.13	Nucleus	1H	Number of Transients	16	Origin	spect
Original Points Count	32768	Owner	nmsu	Points Count	32768	Pulse Sequence	zg30
Receiver Gain	7298.20	SW(cyclical) (Hz)	8278.15	Solvent	CHLOROFORM-d		
Spectrum Offset (Hz)	2459.4990	Spectrum Type	STANDARD	Sweep Width (Hz)	8277.89	Temperature (degree C)	27.000

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Acquisition Time (sec)	1.3664	Comment					
Frequency (MHz)	100.61	Nucleus	¹³ C	Number of Transients	1024	Origin	spect
Original Points Count	32768	Owner	nmsu	Points Count	32768	Pulse Sequence	zgpg30
Receiver Gain	1625.50	SW(cyclical) (Hz)	23980.81	Solvent	CHLOROFORM-d		
Spectrum Offset (Hz)	10060.8027	Spectrum Type	STANDARD	Sweep Width (Hz)	23980.08	Temperature (degree C)	27.000

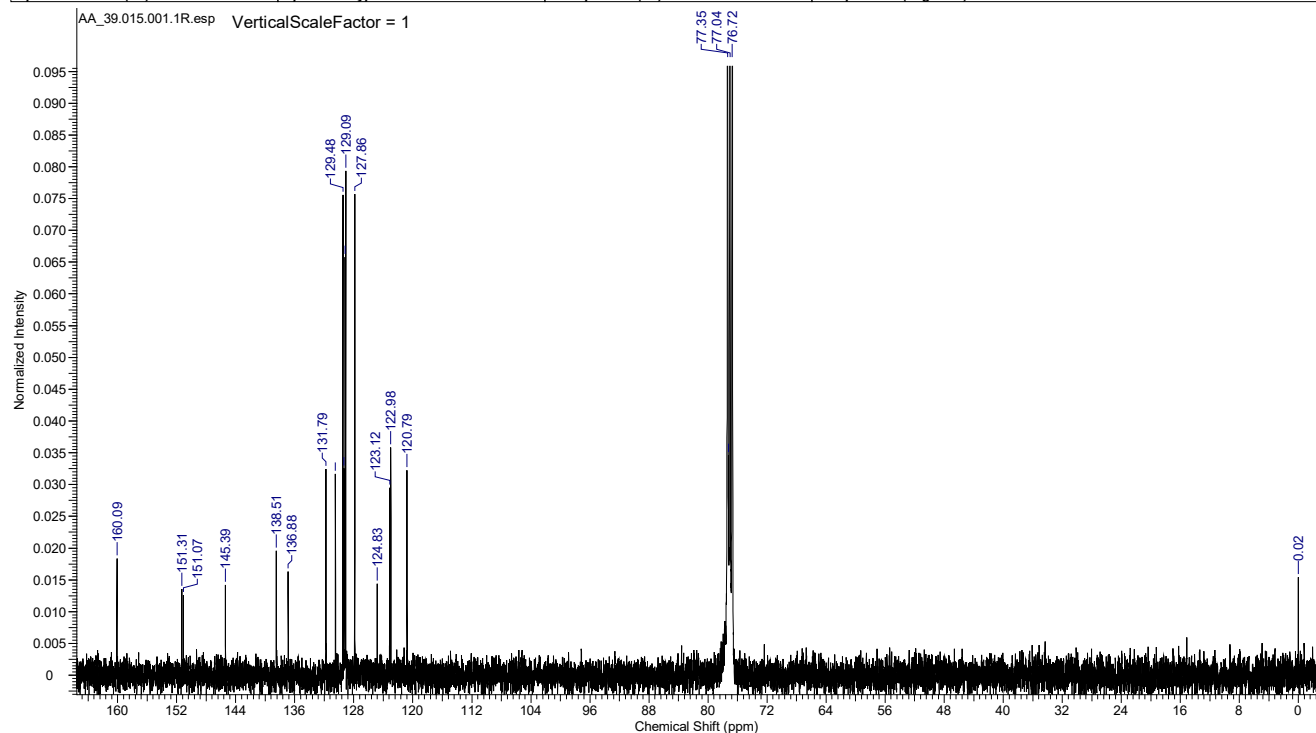


6-nitro-2,4-diphenylquinoline (7ab):

Acquisition Time (sec)		3.9584			
Frequency (MHz)		400.13			
Original Points Count		32768			
Receiver Gain		362.00			
Spectrum Offset (Hz)		2462.5442			
Nucleus		1H			
Owner		nmrsu			
SW(cyclical) (Hz)		8278.15			
Spectrum Type		STANDARD			
Number of Transients		16			
Points Count		32768			
Pulse Sequence		zg30			
Solvent		CHLOROFORM-d			
Sweep Width (Hz)		8277.89			
Temperature (degree C)		27.000			



Acquisition Time (sec)		1.3664			
Date Stamp					
Frequency (MHz)	100.61	Nucleus	13C	Number of Transients	4096
Origin	spect	Owner	nmrsu	Points Count	32768
Pulse Sequence	zgpg30	Original Points Count	32768	Solvent	CHLOROFORM-d
Receiver Gain	1625.50	SW(cyclical) (Hz)	23980.81	Sweep Width (Hz)	23980.08
Spectrum Offset (Hz)	10060.8027	Spectrum Type	STANDARD	Temperature (degree C)	27.000

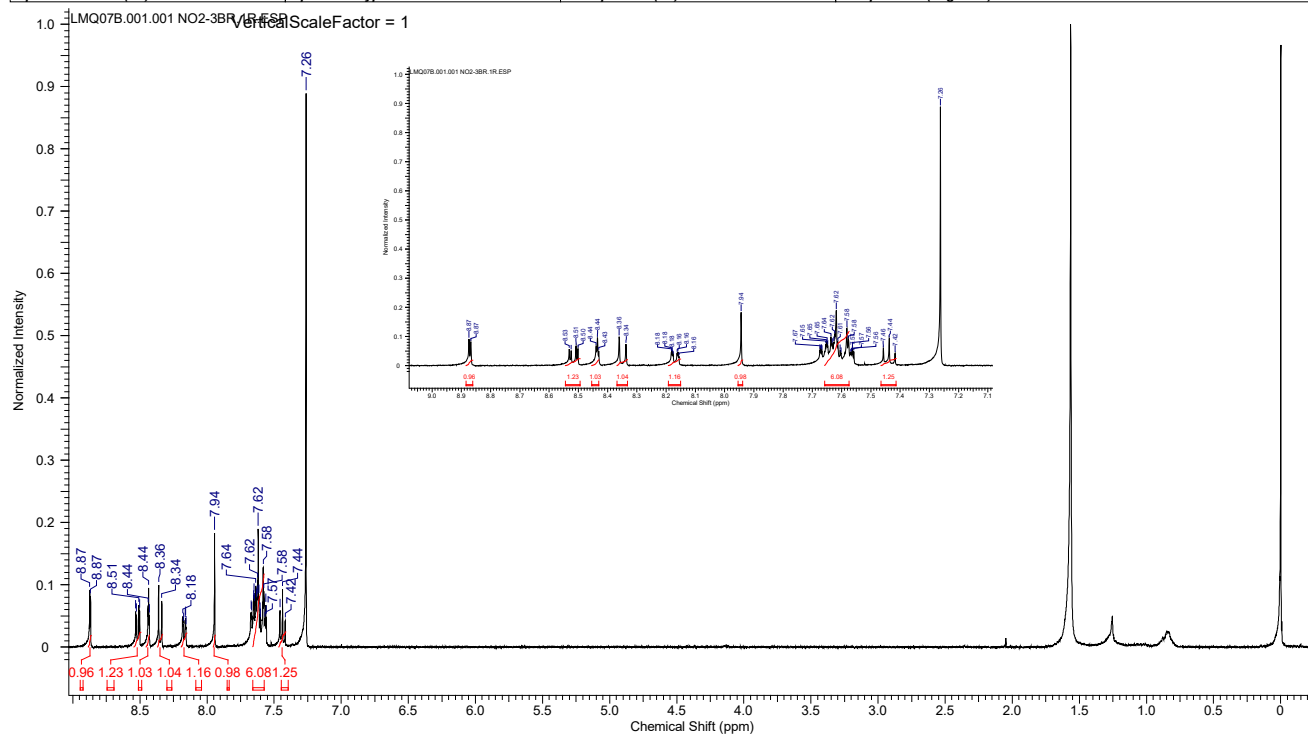


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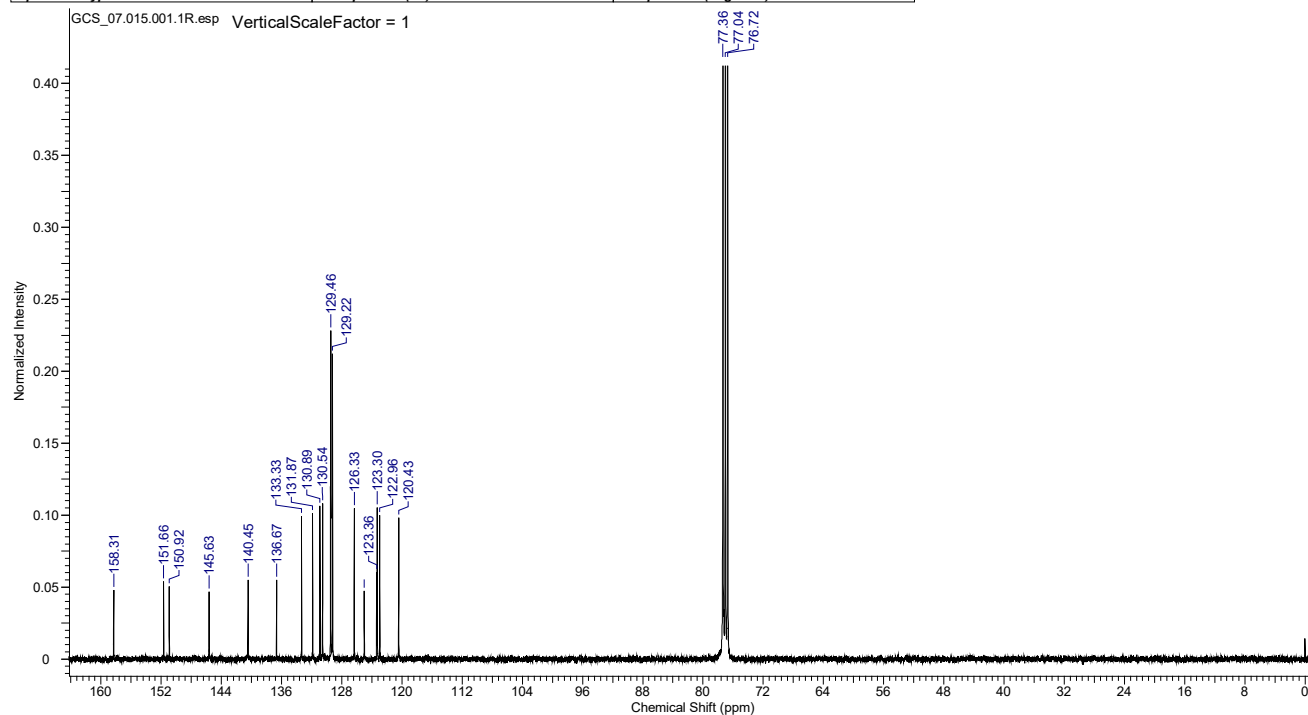
2-(3-bromophenyl)-6-nitro-4-phenylquinoline (7ac):

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Acquisition Time (sec)	3.9584				
Frequency (MHz)	400.13	Nucleus	¹ H	Number of Transients	16
Original Points Count	32768	Owner	nmrslu	Points Count	32768
Receiver Gain	4096.00	SW(cyclical) (Hz)	8278.15	Solvent	CHLOROFORM-d
Spectrum Offset (Hz)	2461.2476	Spectrum Type	STANDARD	Sweep Width (Hz)	8277.89
				Temperature (degree C)	27.000

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Acquisition Time (sec)	1.3664				
Frequency (MHz)	100.61	Nucleus	¹³ C	Number of Transients	6144
Original Points Count	32768	Owner	nmrslu	Points Count	32768
Receiver Gain	5792.60	SW(cyclical) (Hz)	23980.81	Solvent	CHLOROFORM-d
Spectrum Type	STANDARD	Sweep Width (Hz)	23980.08	Temperature (degree C)	21.600
				Spectrum Offset (Hz)	10060.8027

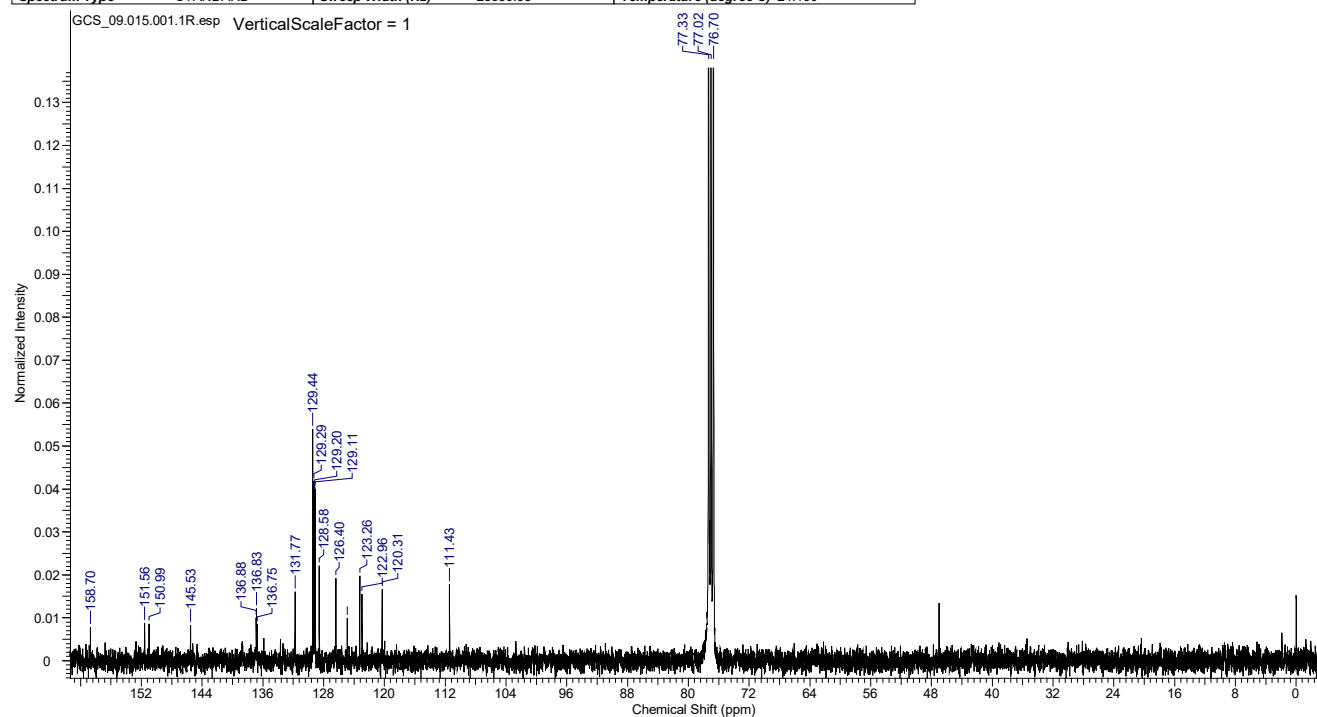


2-(4-chlorophenyl)-6-nitro-4-phenylquinoline (7ad):

Acquisition Time (sec) 3.9584					
Frequency (MHz) 400.13		Nucleus 1H	Number of Transients 16		Origin spect
Original Points Count 32768		Owner nmrsu	Points Count 32768		Pulse Sequence zg30
Receiver Gain 16384.00		SW(cyclical) (Hz) 8278.15	Solvent CHLOROFORM-d		
Spectrum Offset (Hz) 2461.2078		Spectrum Type STANDARD	Sweep Width (Hz) 8277.89		Temperature (degree C) 27.000



Acquisition Time (sec) 1.3664			
Frequency (MHz) 100.61	Nucleus 13C	Number of Transients 4096	Origin spect
Original Points Count 32768	Owner nmrsu	Points Count 32768	Pulse Sequence zgpg30
Receiver Gain 2580.30	SW(cyclical) (Hz) 23980.81	Solvent CHLOROFORM-d	Spectrum Offset (Hz) 10060.8027
Spectrum Type STANDARD	Sweep Width (Hz) 23980.08	Temperature (degree C) 24.100	

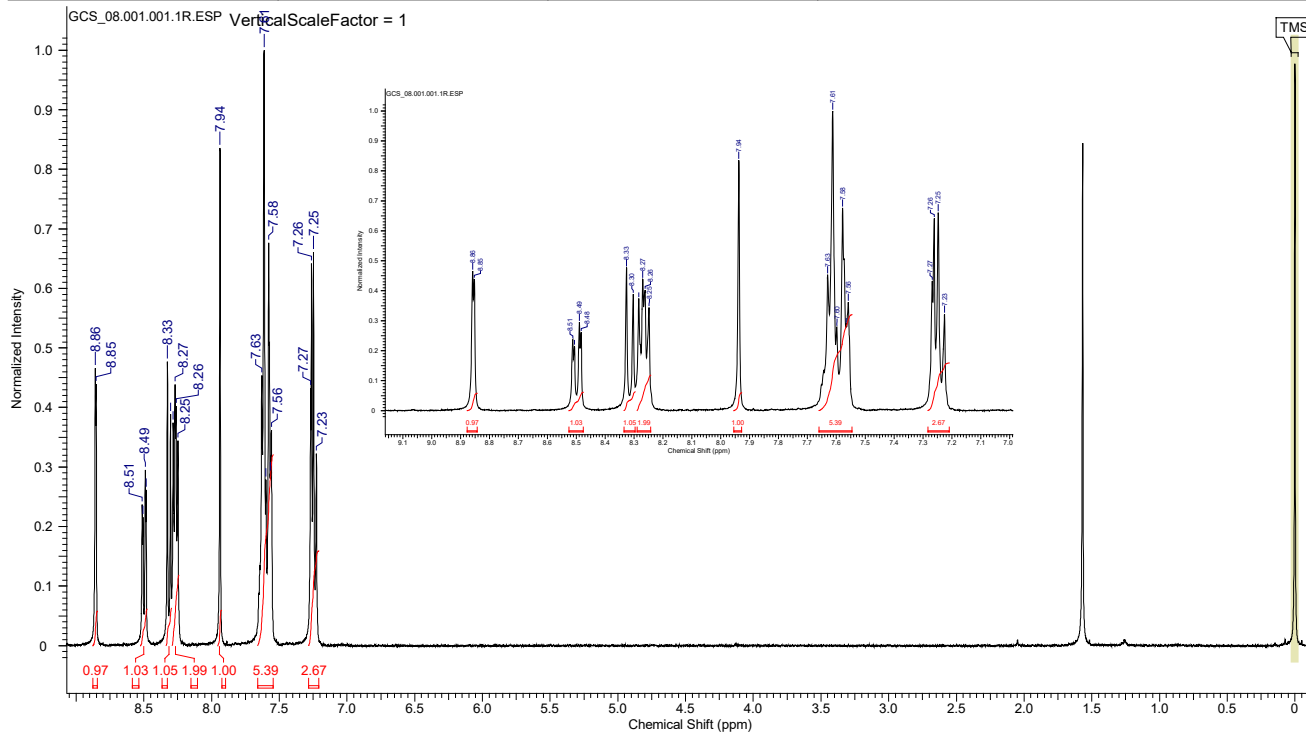


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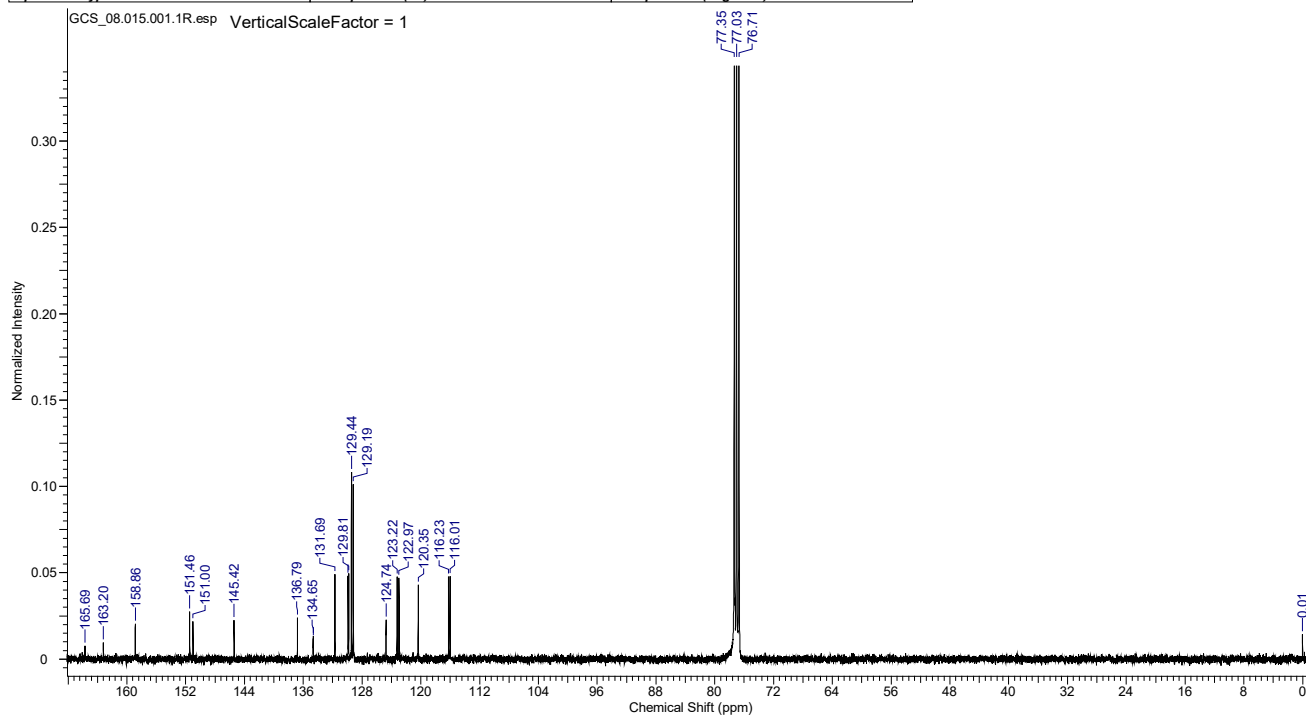
2-(4-fluorophenyl)-6-nitro-4-phenylquinoline (7ae):

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Acquisition Time (sec)	3.9584		
Frequency (MHz)	400.13	Nucleus	¹ H
Original Points Count	32768	Owner	nmrsu
Receiver Gain	456.10	SW(cyclical) (Hz)	8278.15
Spectrum Offset (Hz)	2461.9282	Spectrum Type	STANDARD
		Sweep Width (Hz)	8277.89
		Temperature (degree C)	21.300
		Number of Transients	16
		Points Count	32768
		Pulse Sequence	zg30
		Solvent	CHLOROFORM-d

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Acquisition Time (sec)	1.3664		
Frequency (MHz)	100.61	Nucleus	¹³ C
Original Points Count	32768	Owner	nmrsu
Receiver Gain	3649.10	SW(cyclical) (Hz)	23980.81
Spectrum Type	STANDARD	Sweep Width (Hz)	23980.08
		Temperature (degree C)	21.800
		Number of Transients	6144
		Points Count	32768
		Pulse Sequence	zgpg30
		Solvent	CHLOROFORM-d
		Spectrum Offset (Hz)	10060.8027

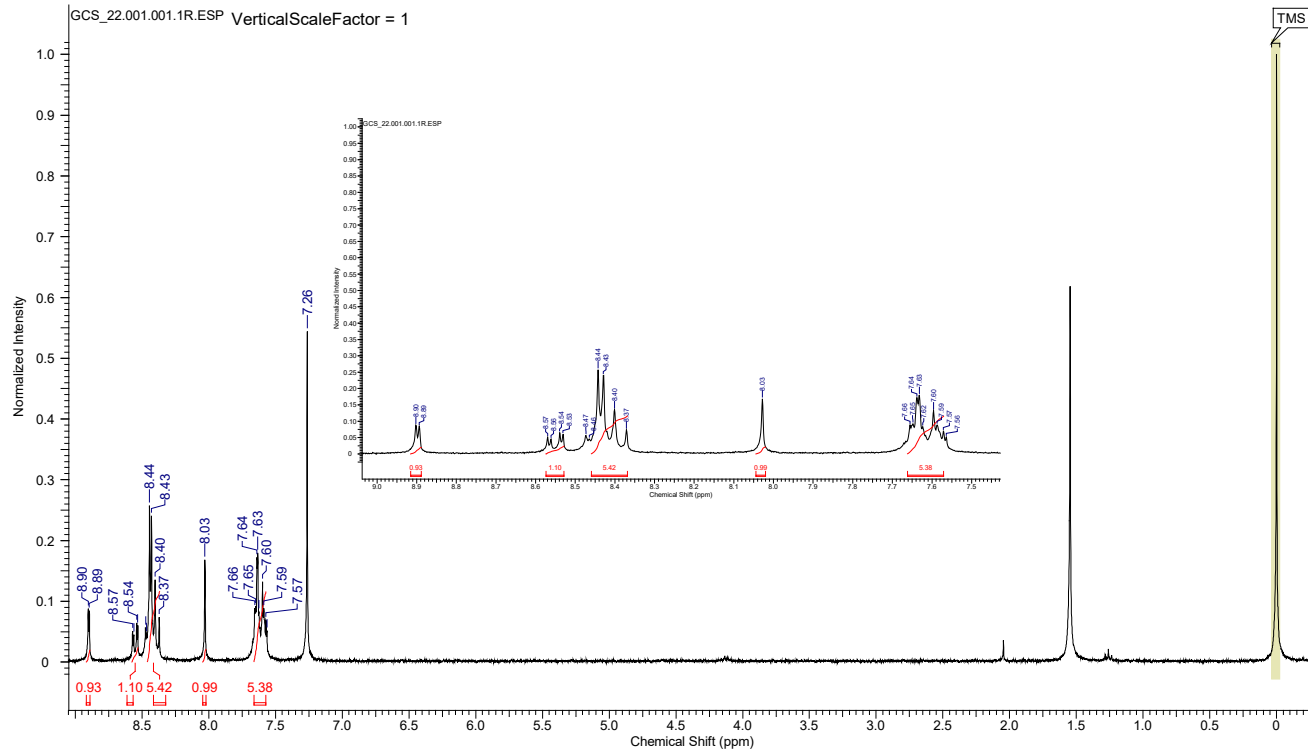


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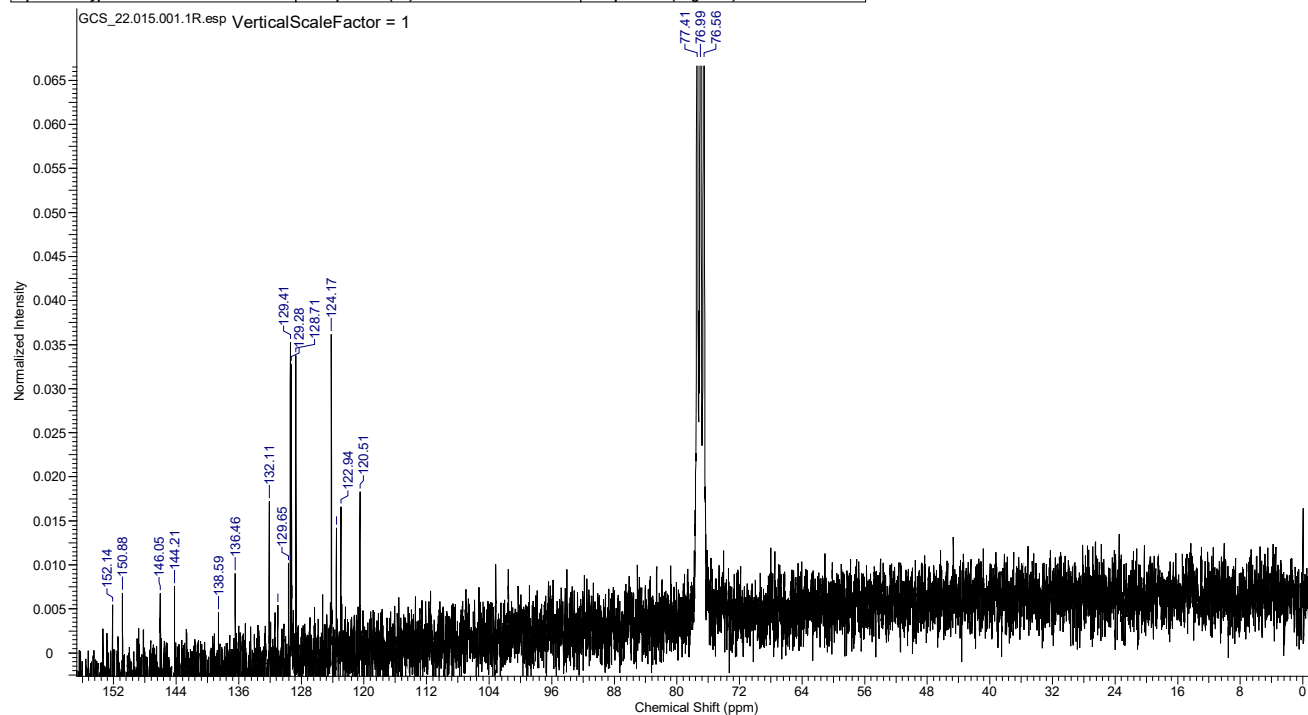
2-(4-nitrophenyl)-6-nitro-4-phenylquinoline (7af):

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Acquisition Time (sec) 3.2047									
					Frequency (MHz)	300.13	Nucleus	1H	
Number of Transients	16	Origin	spect	Original Points Count	16384	Owner	root	Points Count	16384
Pulse Sequence	zg30	Receiver Gain	5792.60	SW(cyclical) (Hz)	5112.47	Solvent	CHLOROFORM-d		
Spectrum Offset (Hz)	2095.0005	Spectrum Type	STANDARD	Sweep Width (Hz)	5112.16	Temperature (degree C)	27.000		

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Acquisition Time (sec)	1.8219								
Frequency (MHz)	75.47	Nucleus	¹³ C	Number of Transients	8192	Origin	spect		
Original Points Count	32768	Owner	root	Points Count	32768	Pulse Sequence	zgpg30		
Receiver Gain	32768.00	SW(cyclical) (Hz)	17985.61	Solvent	CHLOROFORM-d	Spectrum Offset (Hz)	7546.2993		
Spectrum Type	STANDARD	Sweep Width (Hz)	17985.06	Temperature (degree C)	27.000				

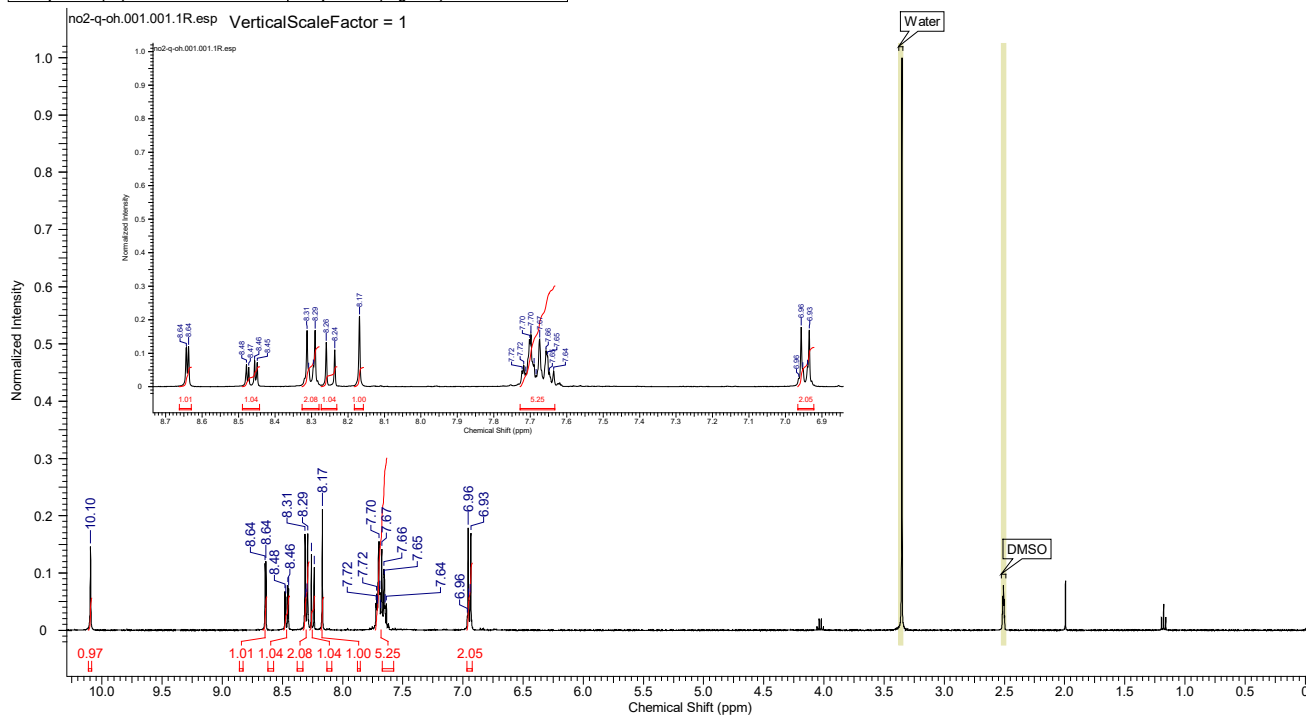


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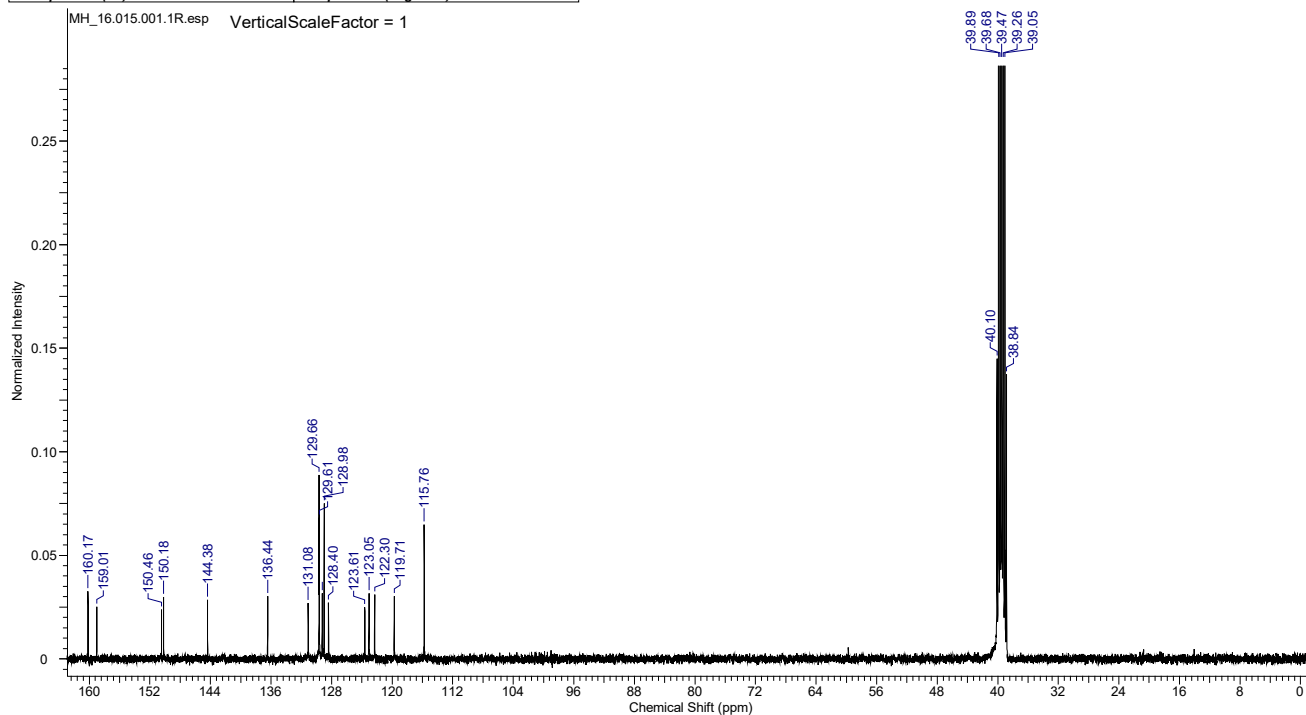
4-(6-nitro-4-phenylquinolin-2-yl)phenol (7ag):

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Acquisition Time (sec)	3.9584				
				Frequency (MHz)	400.13
Nucleus	¹ H	Number of Transients	16	Origin	spect
Owner	nmrsu	Points Count	32768	Pulse Sequence	zg30
SW(cyclical) (Hz)	8278.15	Solvent	DMSO-d6	Receiver Gain	4096.00
Sweep Width (Hz)	8277.89	Temperature (degree C)	27.000	Spectrum Offset (Hz)	2468.6101
				Spectrum Type	STANDARD

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Acquisition Time (sec)	1.3664				
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Nucleus	¹³ C	Number of Transients	2560	Origin	spect
Owner	nmrsu	Points Count	32768	Pulse Sequence	zgpg30
SW(cyclical) (Hz)	23980.81	Solvent	DMSO-d6	Receiver Gain	1625.50
Sweep Width (Hz)	23980.08	Temperature (degree C)	27.000	Spectrum Offset (Hz)	10010.4971
				Spectrum Type	STANDARD

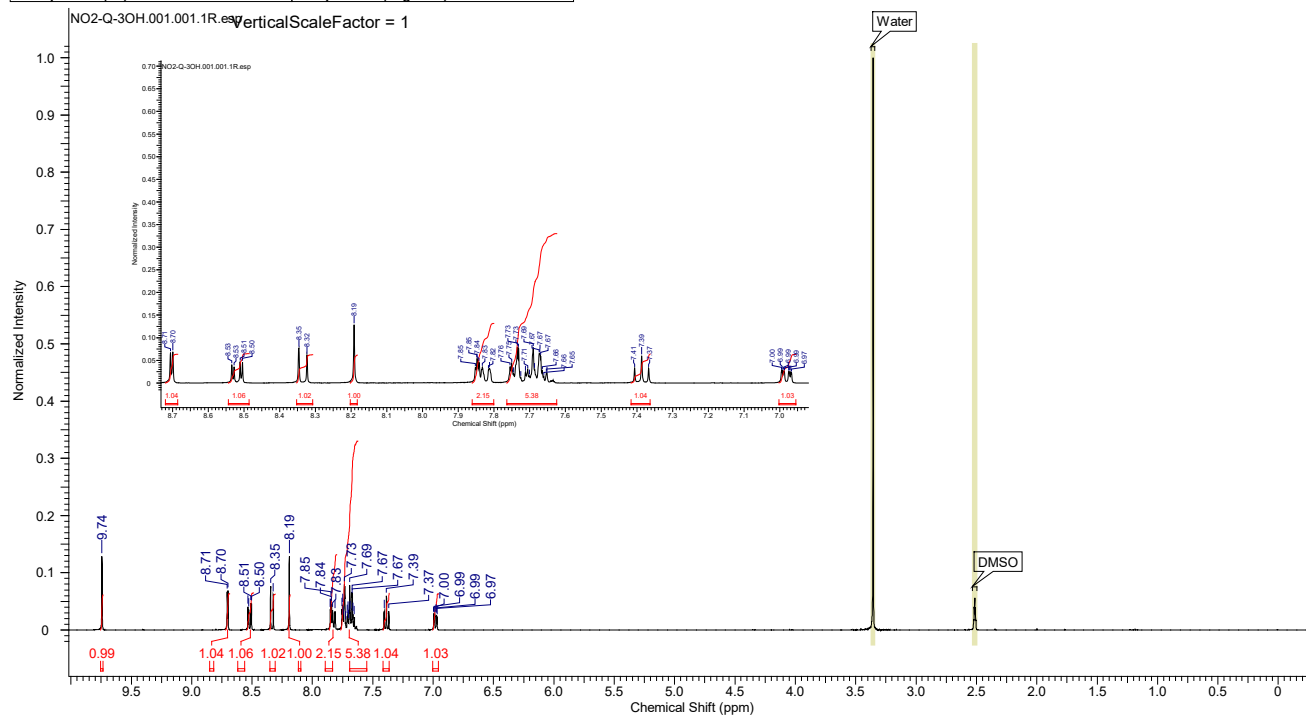


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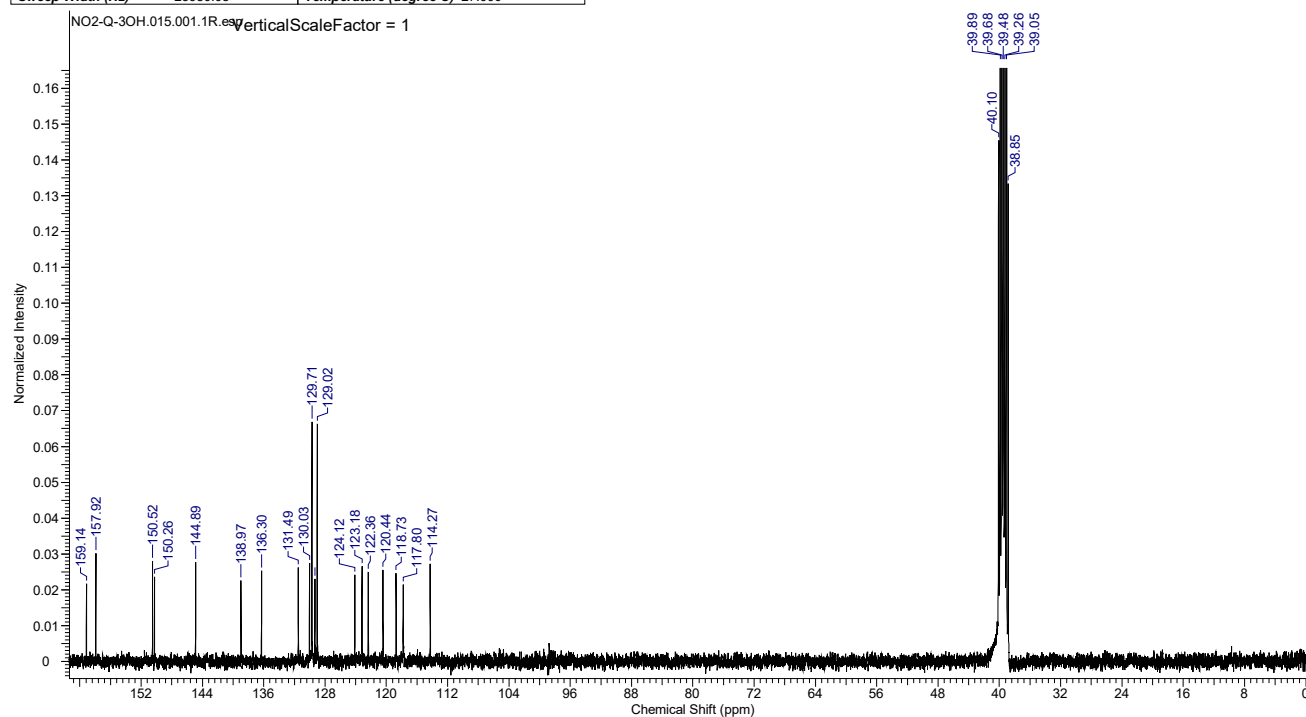
3-(6-nitro-4-phenylquinolin-2-yl)phenol (7ah):

This report was created by ACD/NMR Processor Academic Edition. For more information go to www.acdlabs.com/nmrproc/

Acquisition Time (sec)	3.9584			
Nucleus	¹ H	Number of Transients	16	Frequency (MHz)
Owner	nmrsl	Points Count	32768	Original Points Count
SW(cyclical) (Hz)	8278.15	Solvent	DMSO-d ₆	Pulse Sequence
Sweep Width (Hz)	8277.89	Temperature (degree C)	27.000	Receiver Gain
				Spectrum Offset (Hz)
				Spectrum Type

This report was created by ACD/NMR Processor Academic Edition. For more information go to www.acdlabs.com/nmrproc/

Acquisition Time (sec)	1.3664			
Nucleus	¹³ C	Number of Transients	2560	Frequency (MHz)
Owner	nmrsl	Points Count	32768	Original Points Count
SW(cyclical) (Hz)	23980.81	Solvent	DMSO-d ₆	Pulse Sequence
Sweep Width (Hz)	23980.08	Temperature (degree C)	27.000	Receiver Gain
				Spectrum Offset (Hz)
				Spectrum Type

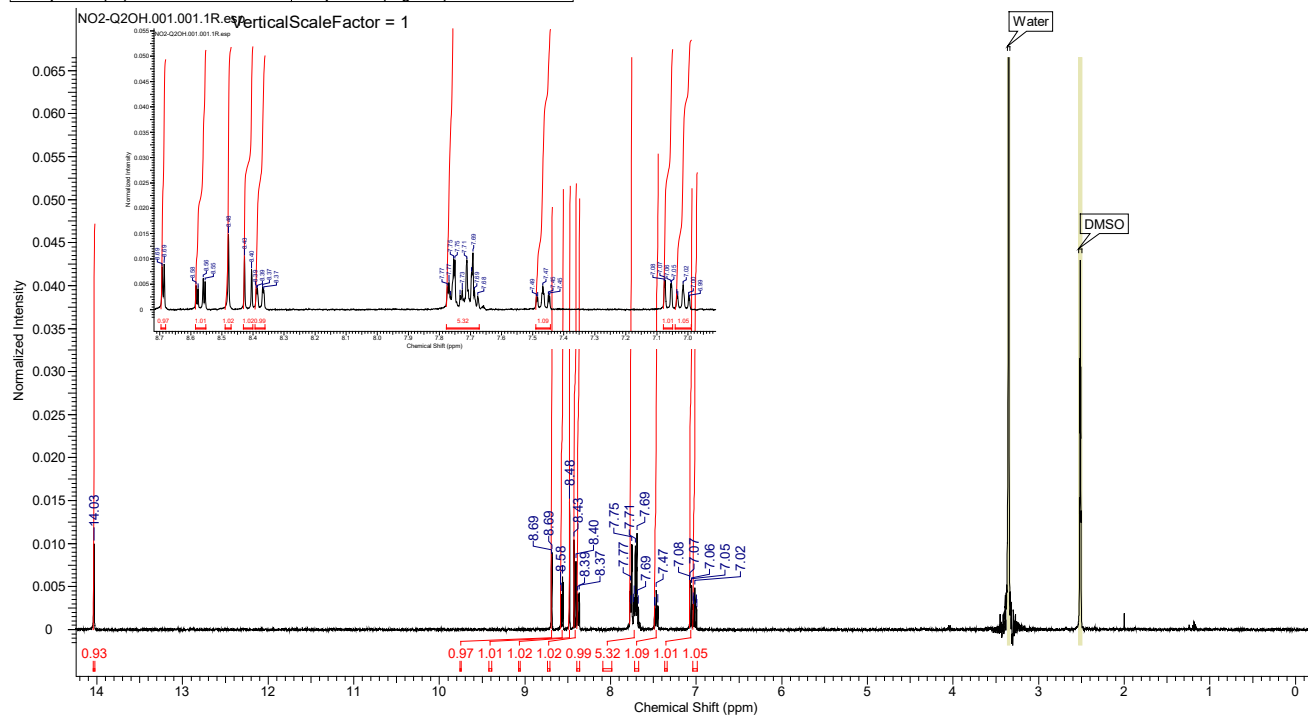


Supporting Information for:

2-(6-nitro-4-phenylquinolin-2-yl)phenol (7ai):

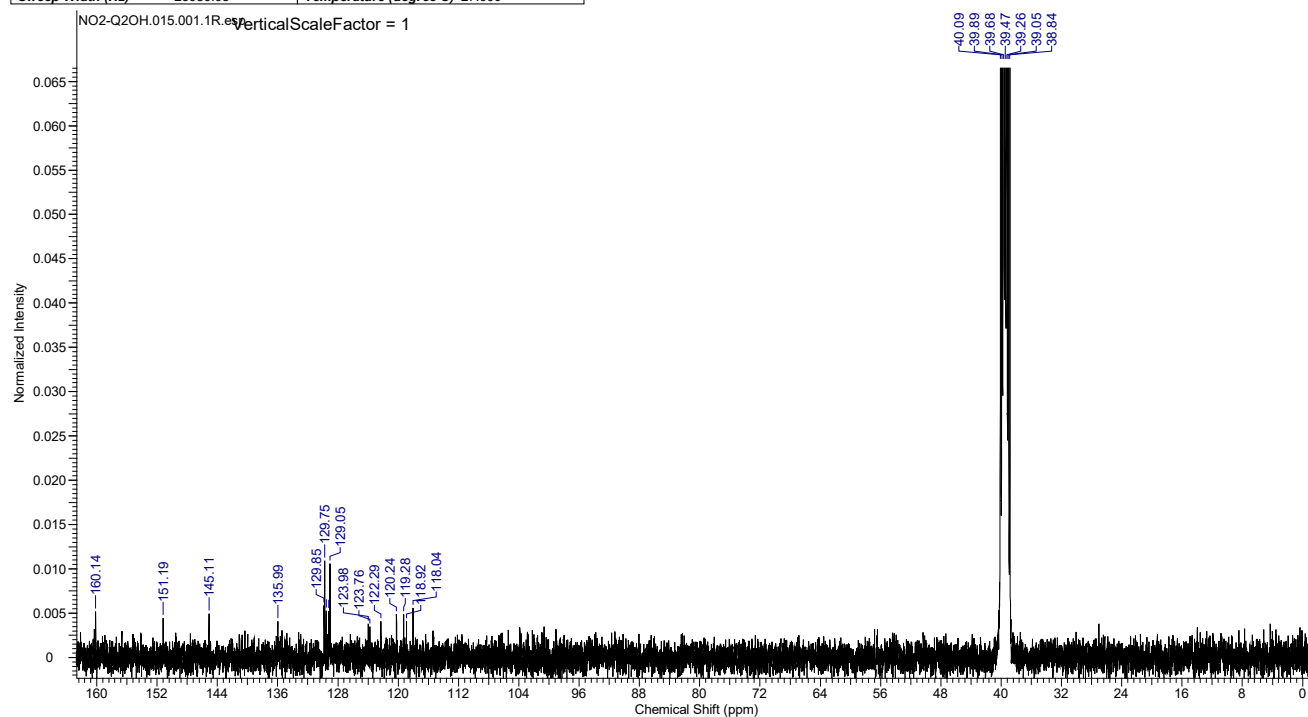
This report was created by ACD/NMR Processor Academic Edition. For more information go to www.acdlabs.com/nmrproc/

Acquisition Time (sec)	3.9584				
Nucleus	¹ H	Number of Transients	16	Origin	spect
Owner	nmrsu	Points Count	32768	Pulse Sequence	zg30
SW(cyclical) (Hz)	8278.15	Solvent	DMSO-d6	Receiver Gain	5792.60
Sweep Width (Hz)	8277.89	Temperature (degree C)	27.000	Spectrum Offset (Hz)	2470.9668
				Spectrum Type	STANDARD



This report was created by ACD/NMR Processor Academic Edition. For more information go to www.acdlabs.com/nmrproc/

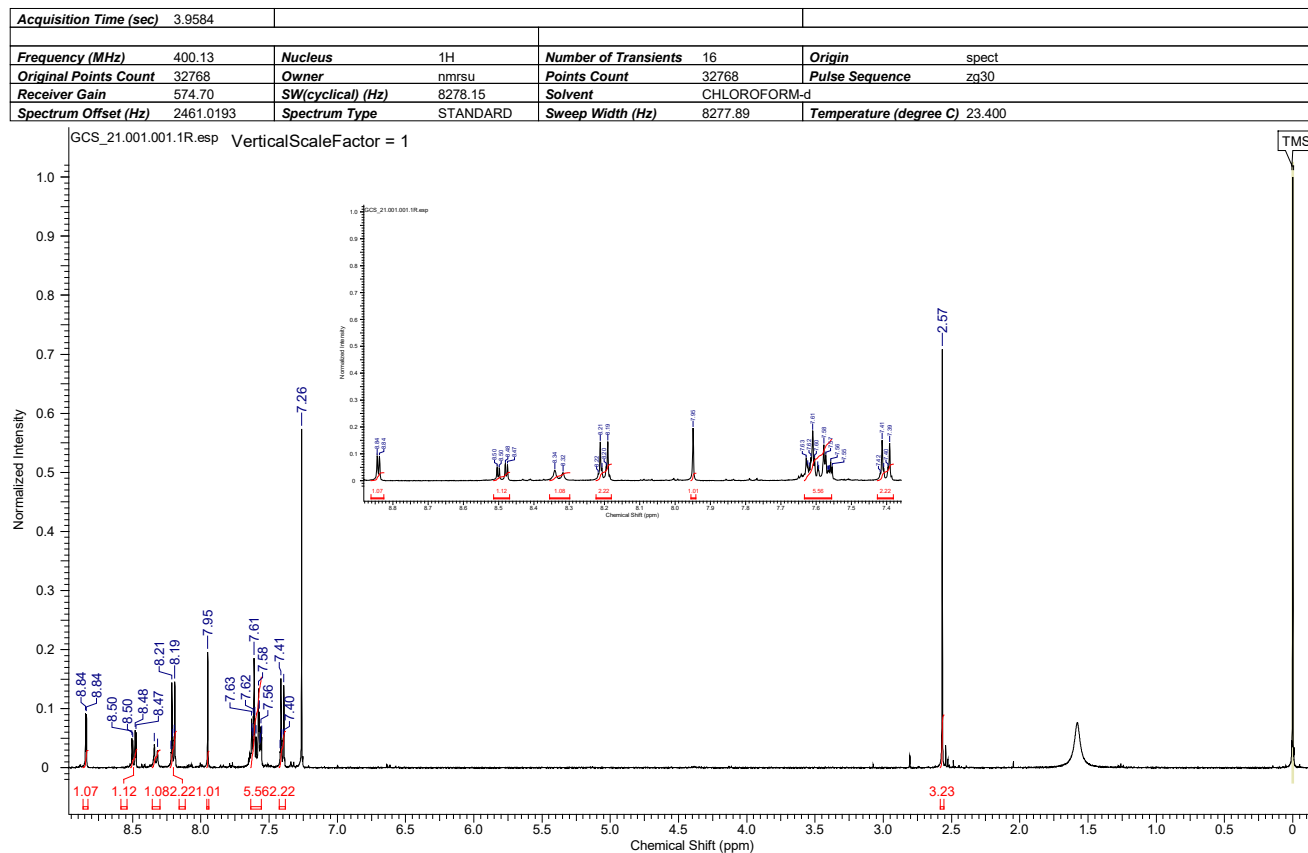
Acquisition Time (sec)	1.3664				
Nucleus	¹³ C	Number of Transients	2560	Origin	spect
Owner	nmrsu	Points Count	32768	Pulse Sequence	zgpg30
SW(cyclical) (Hz)	23980.81	Solvent	DMSO-d6	Receiver Gain	2298.80
Sweep Width (Hz)	23980.08	Temperature (degree C)	27.000	Spectrum Offset (Hz)	10010.4971
				Spectrum Type	STANDARD



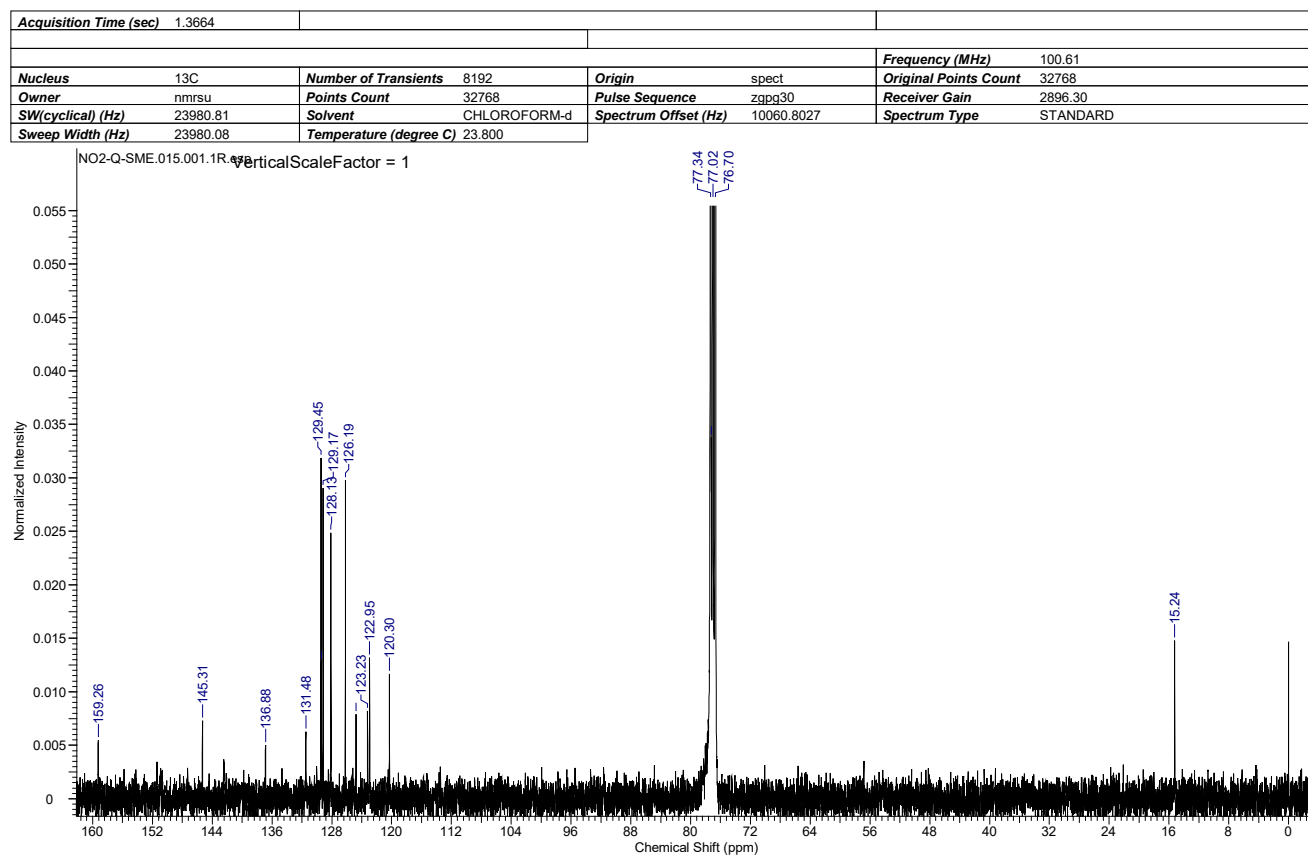
Supporting Information for:

2-(4-(methyltio)phenyl)-6-nitro-4-phenylquinoline (7aj):

This report was created by ACD/NMR Processor Academic Edition. For more information go to www.acdlabs.com/nmrproc/



This report was created by ACD/NMR Processor Academic Edition. For more information go to www.acdlabs.com/nmrproc/

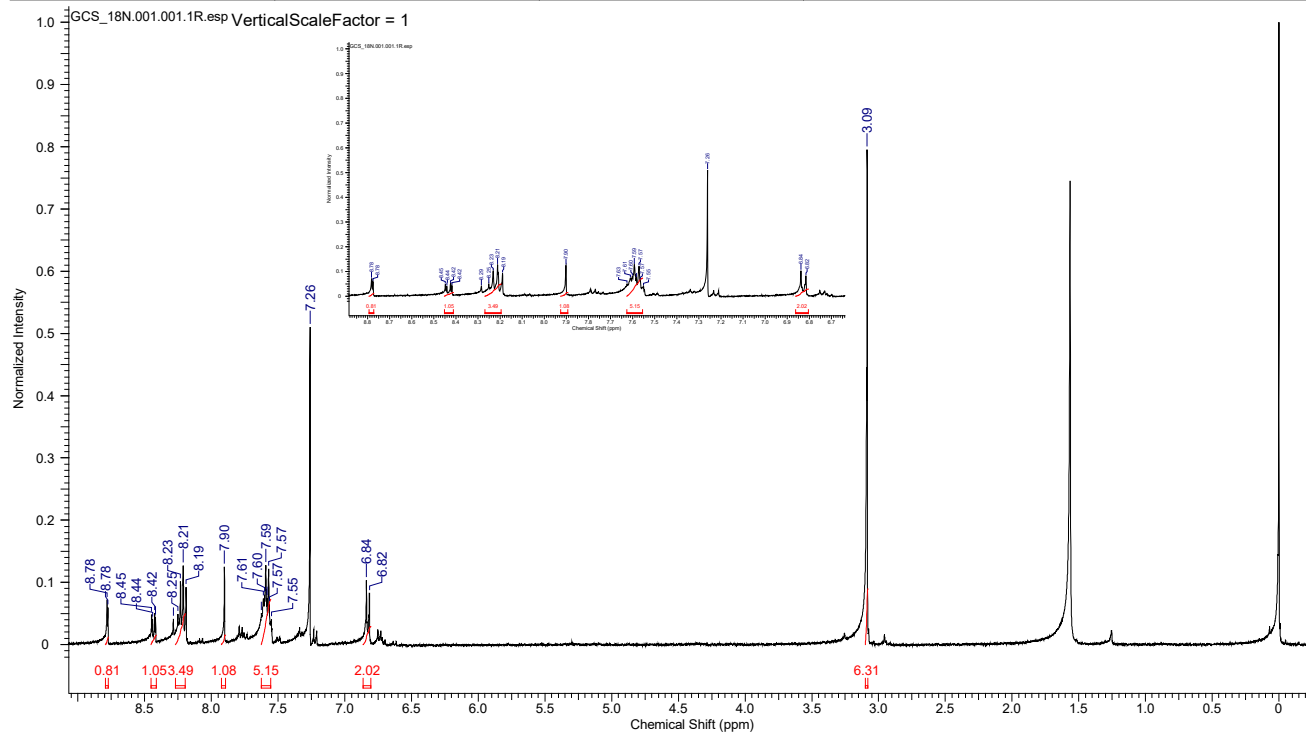


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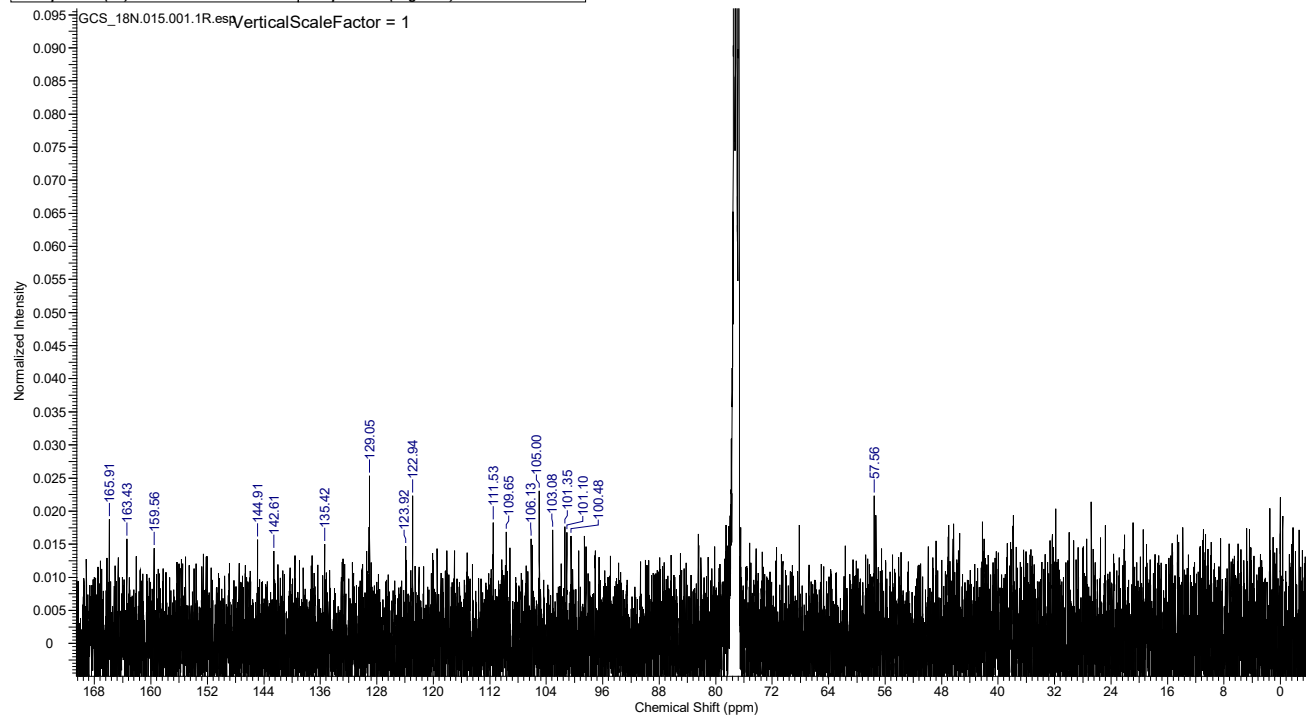
2-(4-(dimethylamino)phenyl)-6-nitro-4-phenylquinoline (7ak):

This report was created by ACD/NMR Processor Academic Edition. For more information go to www.acdlabs.com/nmrproc/

Acquisition Time (sec)		3.9584					
Frequency (MHz)	400.13	Nucleus	1H	Number of Transients	16	Origin	spect
Original Points Count	32768	Owner	nmsru	Points Count	32768	Pulse Sequence	zg30
Receiver Gain	574.70	SW(cyclical) (Hz)	8278.15	Solvent	CHLOROFORM-d		
Spectrum Offset (Hz)	2461.1240	Spectrum Type	STANDARD	Sweep Width (Hz)	8277.89	Temperature (degree C)	23.300

This report was created by ACD/NMR Processor Academic Edition. For more information go to www.acdlabs.com/nmrproc/

Acquisition Time (sec) 1.3664							
Nucleus 13C		Number of Transients 1024		Origin spect		Frequency (MHz) 100.61	
Owner nmrsu		Points Count 32768		Pulse Sequence zgpg30		Original Points Count 32768	
SW(cyclical) (Hz) 23980.81		Solvent CHLOROFORM-d		Spectrum Offset (Hz) 10060.8027		Receiver Gain 1290.20	
Sweep Width (Hz) 23980.08		Temperature (degree C) 23.300				Spectrum Type STANDARD	

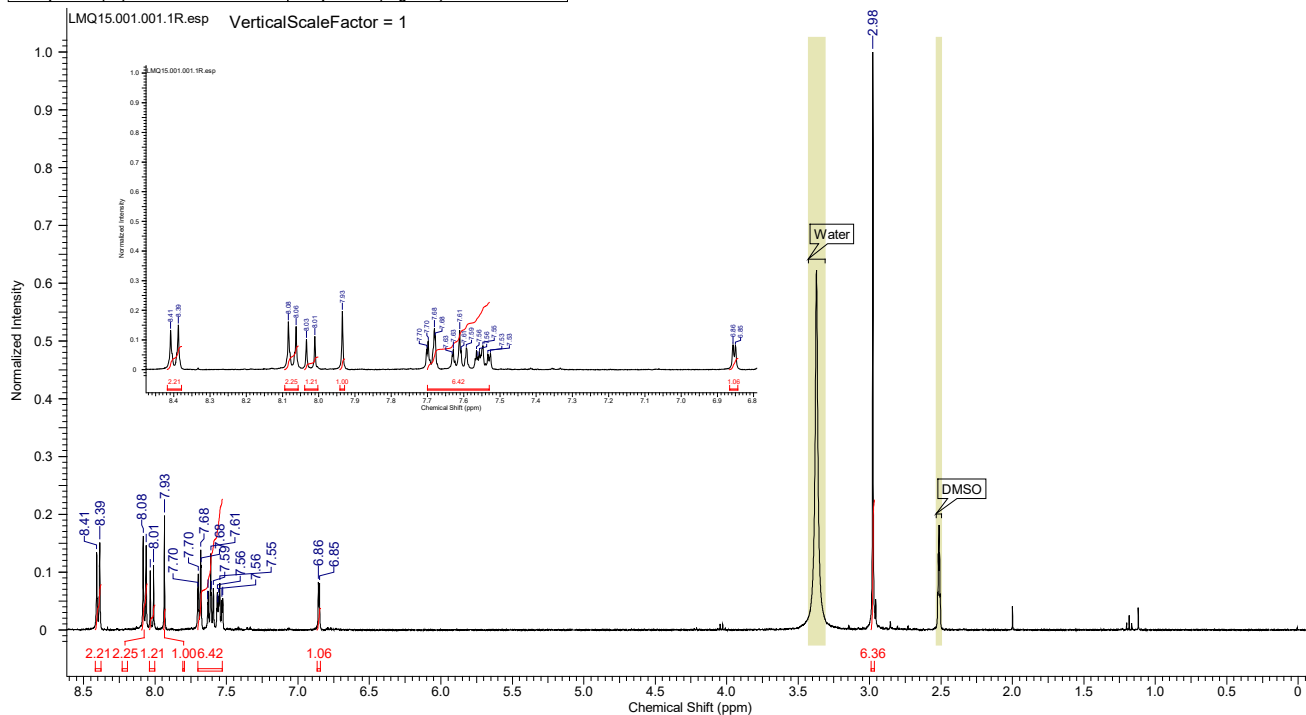


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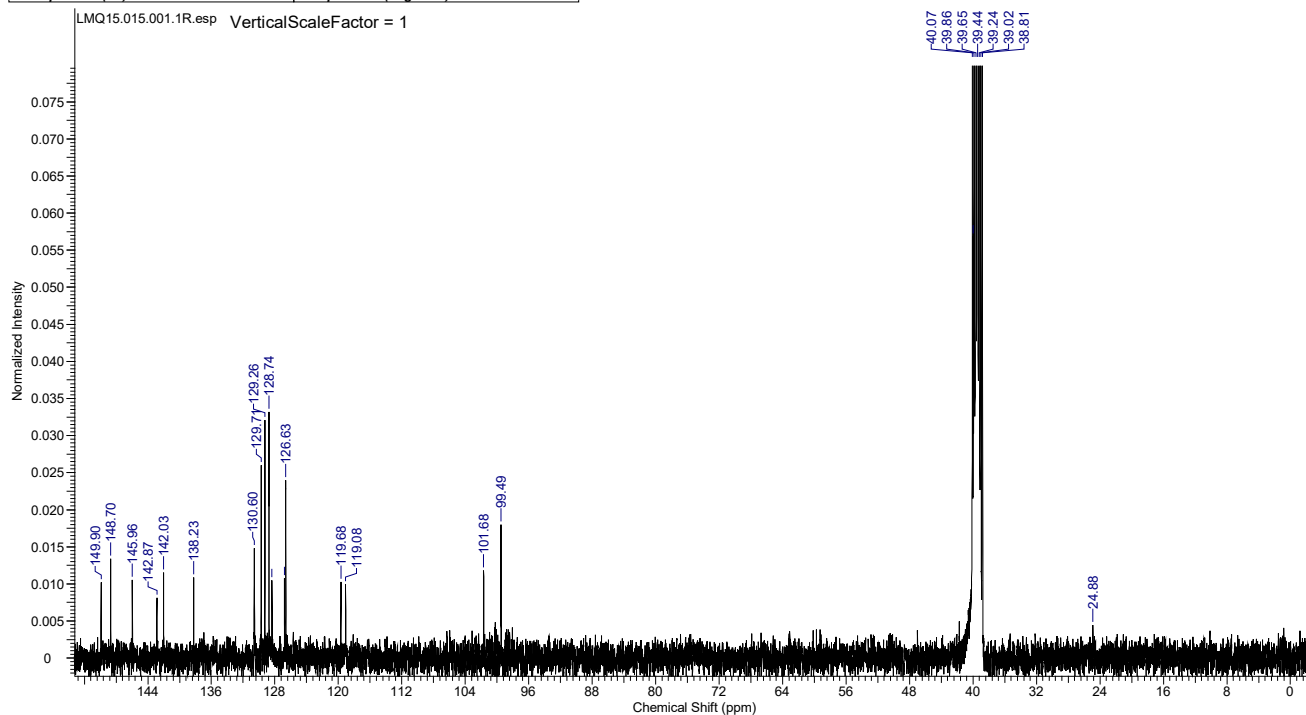
4-(6-(dimethylamino)-4-phenylquinolin-2-yl)benzoic acid(7bl):

This report was created by ACD/NMR Processor Academic Edition. For more information go to www.acdlabs.com/nmrproc/

Acquisition Time (sec)	3.9584			
Nucleus	1H	Number of Transients	16	Frequency (MHz)
Owner	nmlrsu	Points Count	32768	Original Points Count
SW(cyclical) (Hz)	8278.15	Solvent	DMSO-d6	Pulse Sequence
Sweep Width (Hz)	8277.89	Temperature (degree C)	27.000	Receiver Gain
				Spectrum Type

This report was created by ACD/NMR Processor Academic Edition. For more information go to www.acdlabs.com/nmrproc/

Acquisition Time (sec)	1.3664			
Nucleus	13C	Number of Transients	2560	Frequency (MHz)
Owner	nmlrsu	Points Count	32768	Original Points Count
SW(cyclical) (Hz)	23980.81	Solvent	DMSO-d6	Pulse Sequence
Sweep Width (Hz)	23980.08	Temperature (degree C)	27.000	Receiver Gain
				Spectrum Type

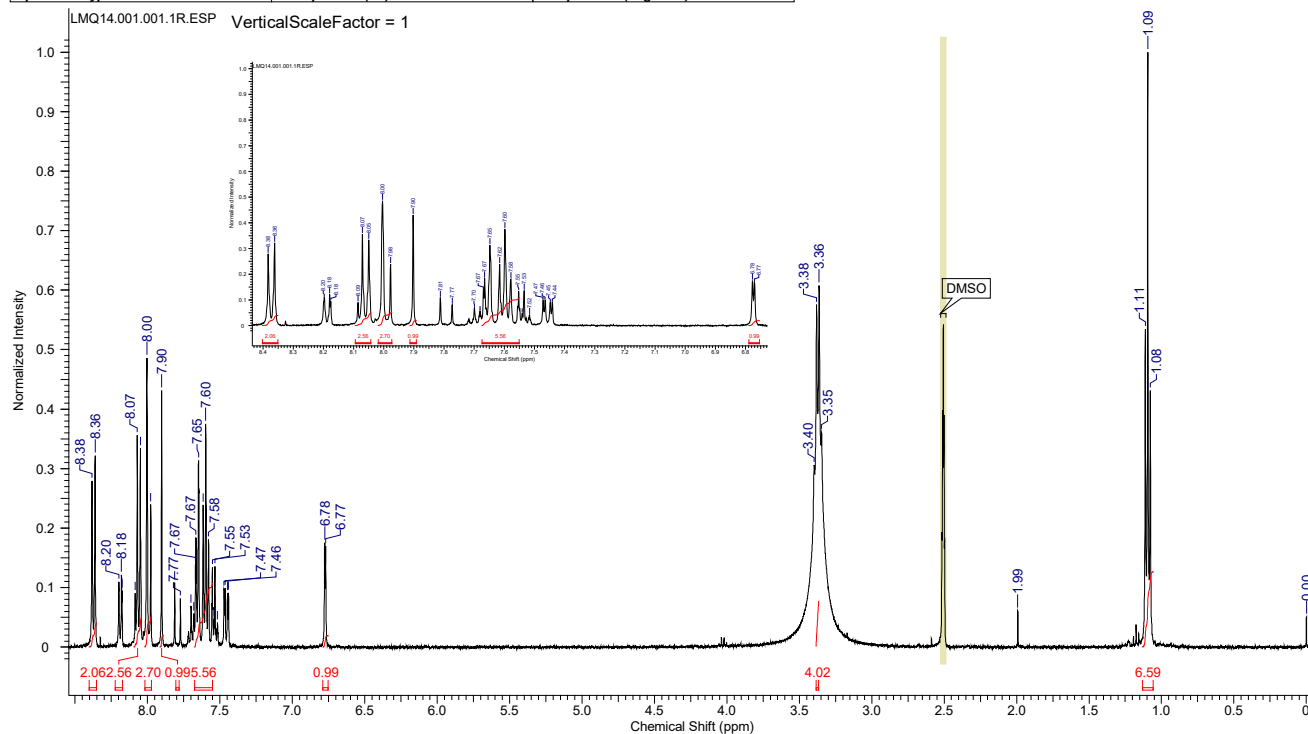


Supporting Information for:

4-(6-(diethylamino)-4-phenylquinolin-2-yl)benzoic acid (7eI):

This report was created by ACD/NMR Processor Academic Edition. For more information go to www.acdlabs.com/nmrproc/

Acquisition Time (sec)	3.9584		
Frequency (MHz)	400.13	Nucleus	¹ H
Original Points Count	32768	Owner	nmrslu
Receiver Gain	11585.20	SW(cyclical) (Hz)	8278.15
Spectrum Type	STANDARD	Sweep Width (Hz)	8277.89
		Number of Transients	16
		Points Count	32768
		Solvent	DMSO-d6
		Temperature (degree C)	27.000
		Origin	spect
		Pulse Sequence	zg30
		Spectrum Offset (Hz)	2467.8215

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Acquisition Time (sec)	1.3664		
Nucleus	¹³ C	Number of Transients	2560
Owner	nmrslu	Points Count	32768
SW(cyclical) (Hz)	23980.81	Solvent	DMSO-d6
Sweep Width (Hz)	23980.08	Temperature (degree C)	27.000
		Frequency (MHz)	100.61
		Original Points Count	32768
		Pulse Sequence	zgpg30
		Receiver Gain	1625.50
		Spectrum Offset (Hz)	10010.4971
		Spectrum Type	STANDARD

