

## SUPPORTING INFORMATION

### **Nucleophile–nucleofuge duality of azide and arylthiolate groups in the synthesis of quinazoline and tetrazoloquinazoline derivatives**

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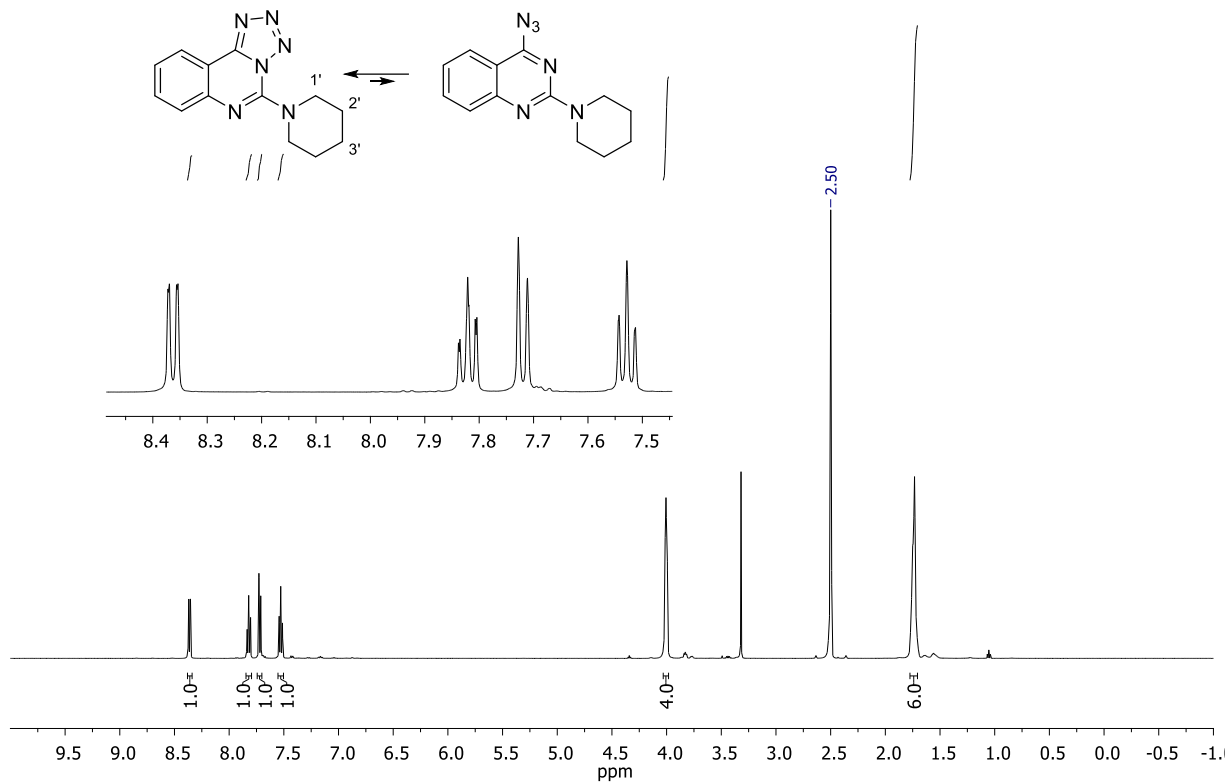
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# NMR spectra

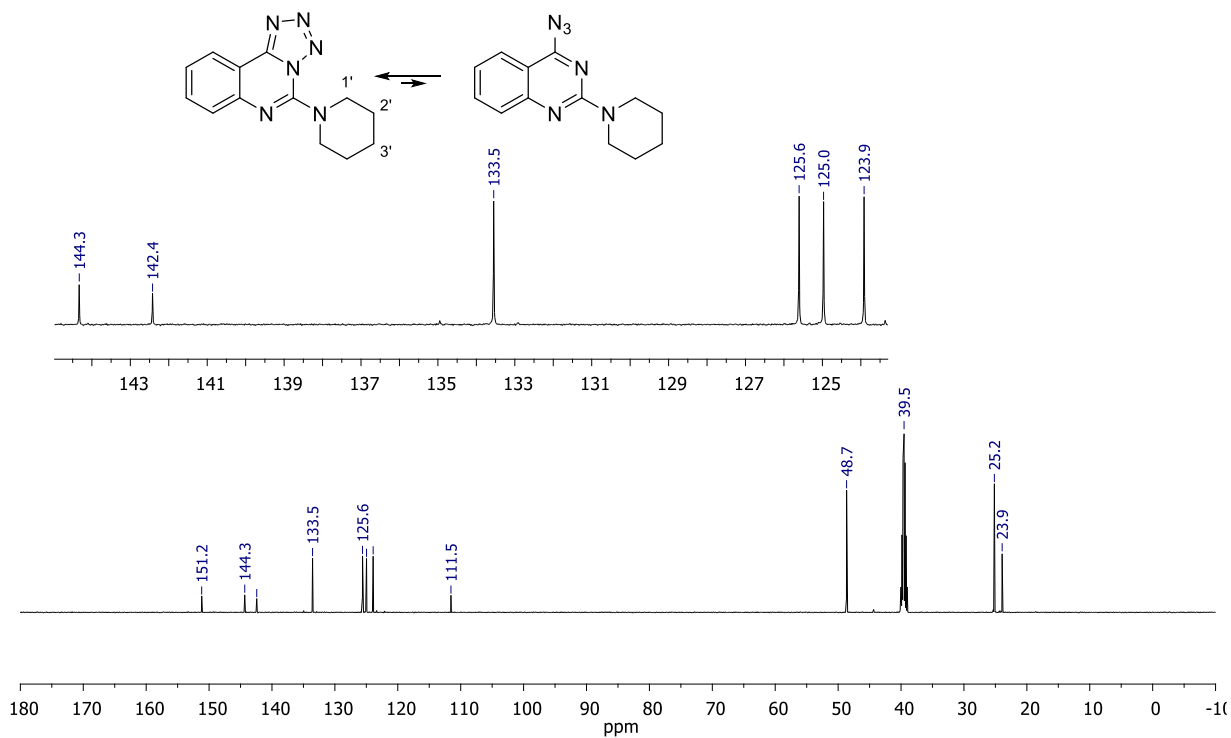
## 5-(Alkylamino)tetrazolo[1,5-c]quinazolines

Tautomeric mixture of 5-(piperidin-1-yl)tetrazolo[1,5-c]quinazoline (4a-T) and 4-azido-2-(piperidin-1-yl)quinazoline (4a-A)

$^1\text{H-NMR}$  (500 MHz,  $\text{DMSO-d}_6$ ) spectrum of compound 4a:

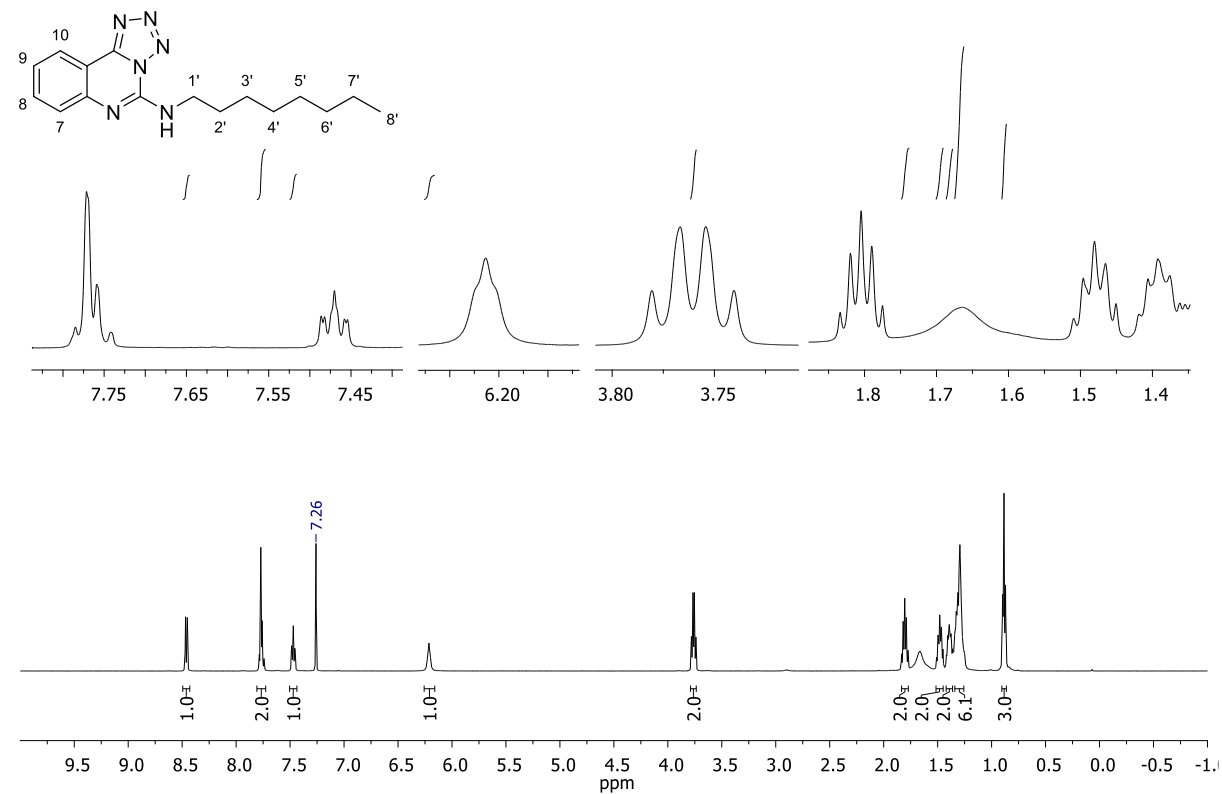


**$^{13}\text{C}$ -NMR (125.7 MHz,  $\text{DMSO-d}_6$ ) spectrum of compound 4a:**

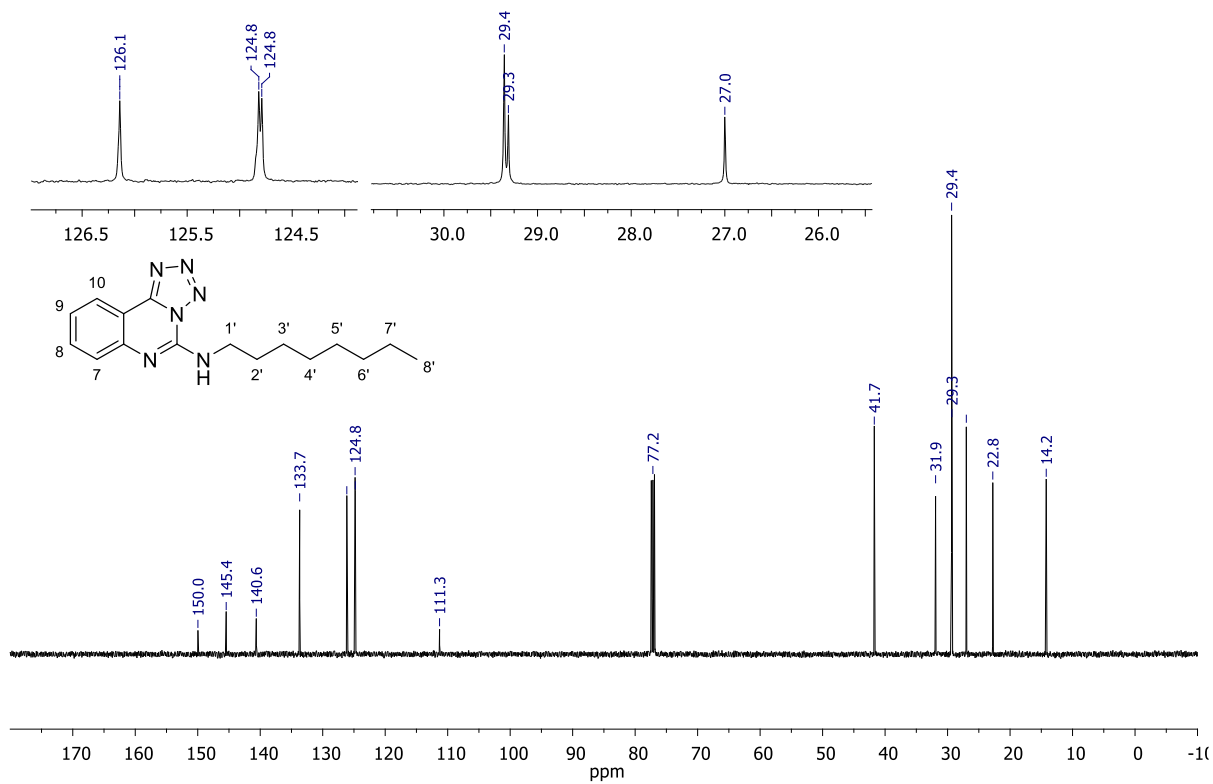


**5-(Octylamino)tetrazolo[1,5-c]quinazoline (4b)**

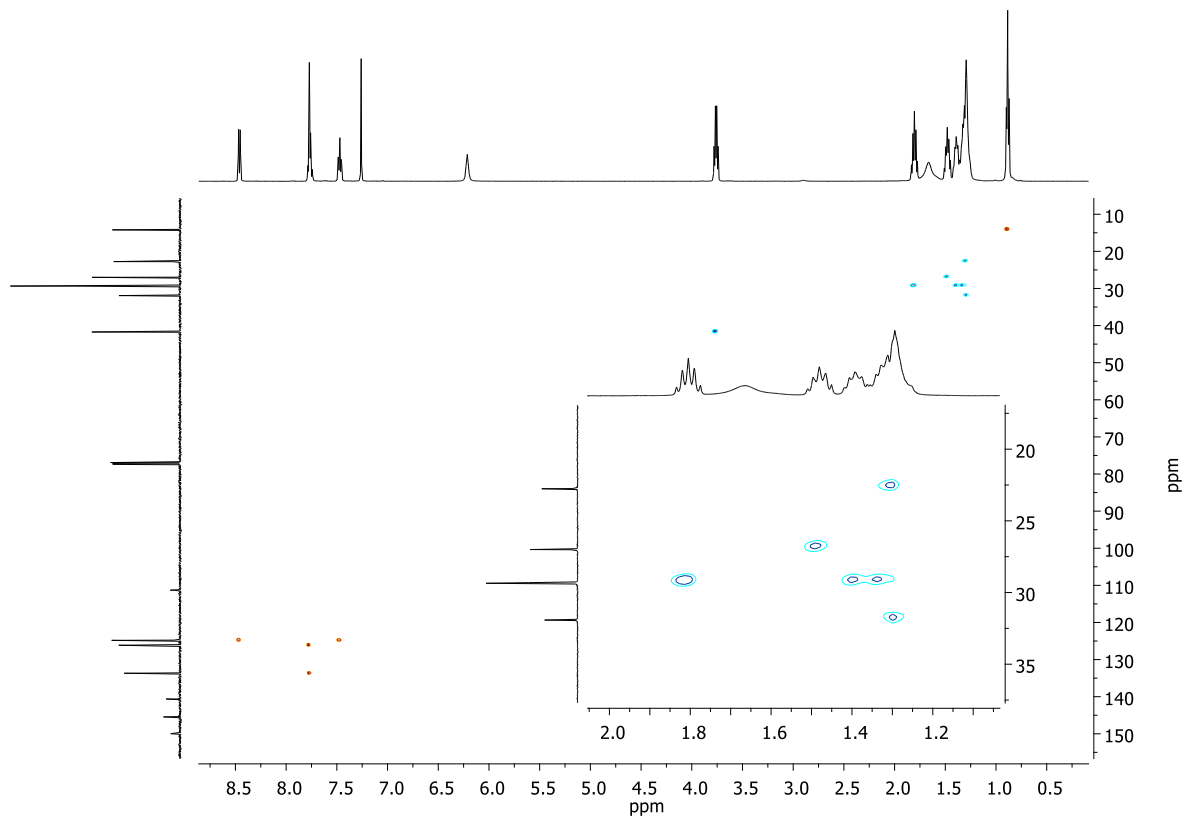
**$^1\text{H}$ -NMR (500 MHz,  $\text{CDCl}_3$ ) spectrum of compound 4b:**



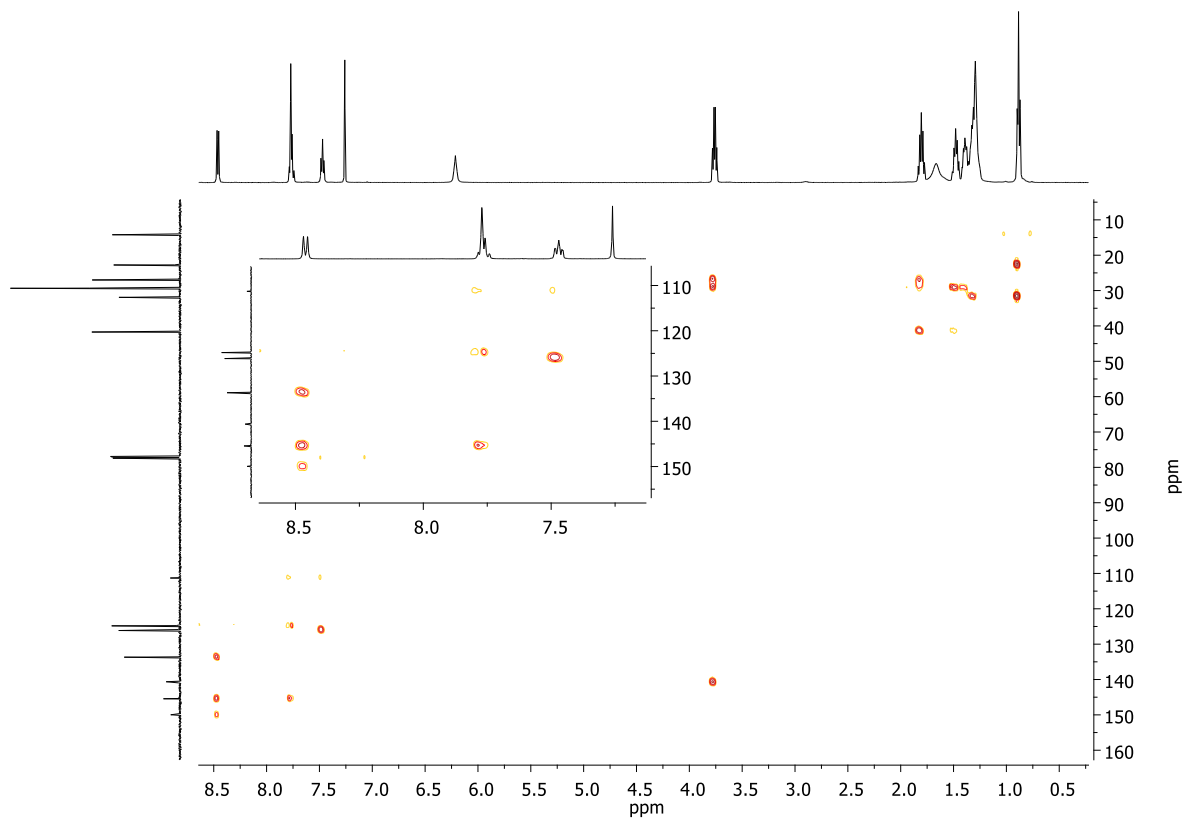
**$^{13}\text{C}$ -NMR (125.7 MHz,  $\text{CDCl}_3$ ) spectrum of compound 4b:**



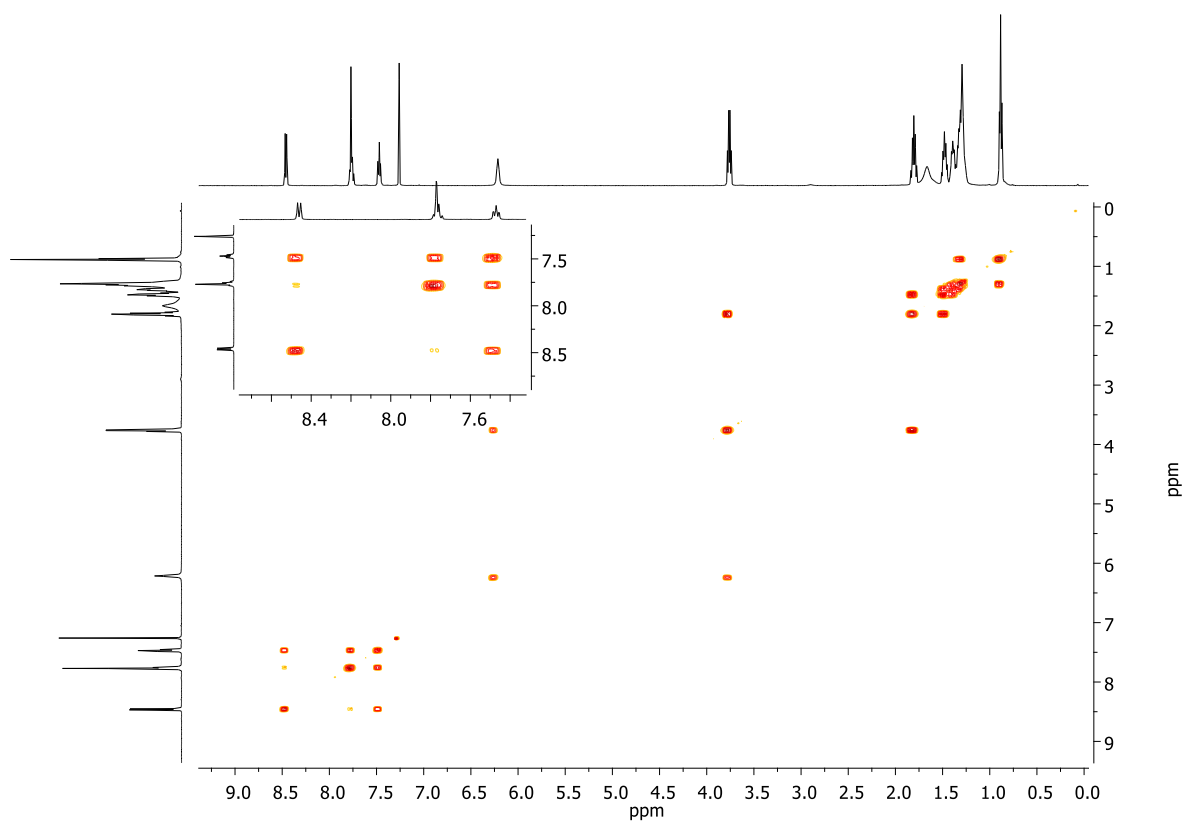
**HSQC spectrum of compound 4b:**



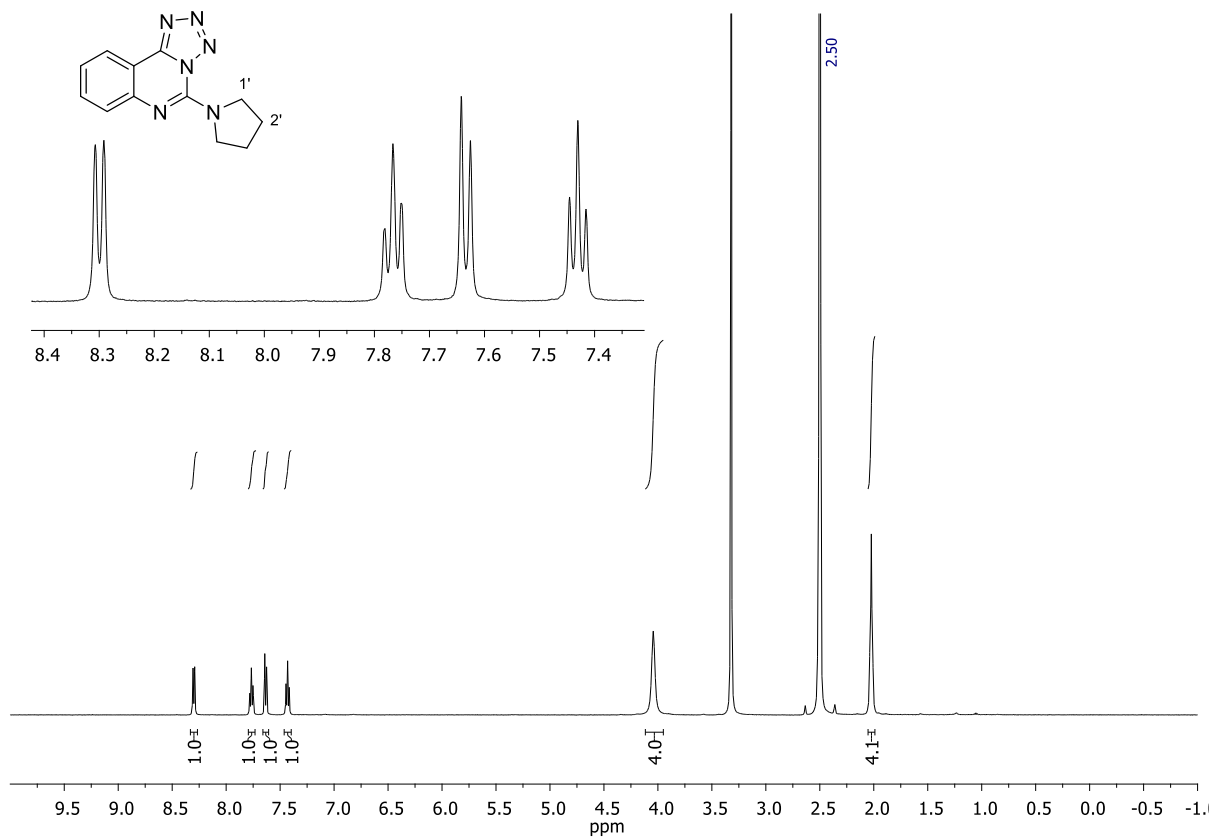
HMBC spectrum of compound 4b:



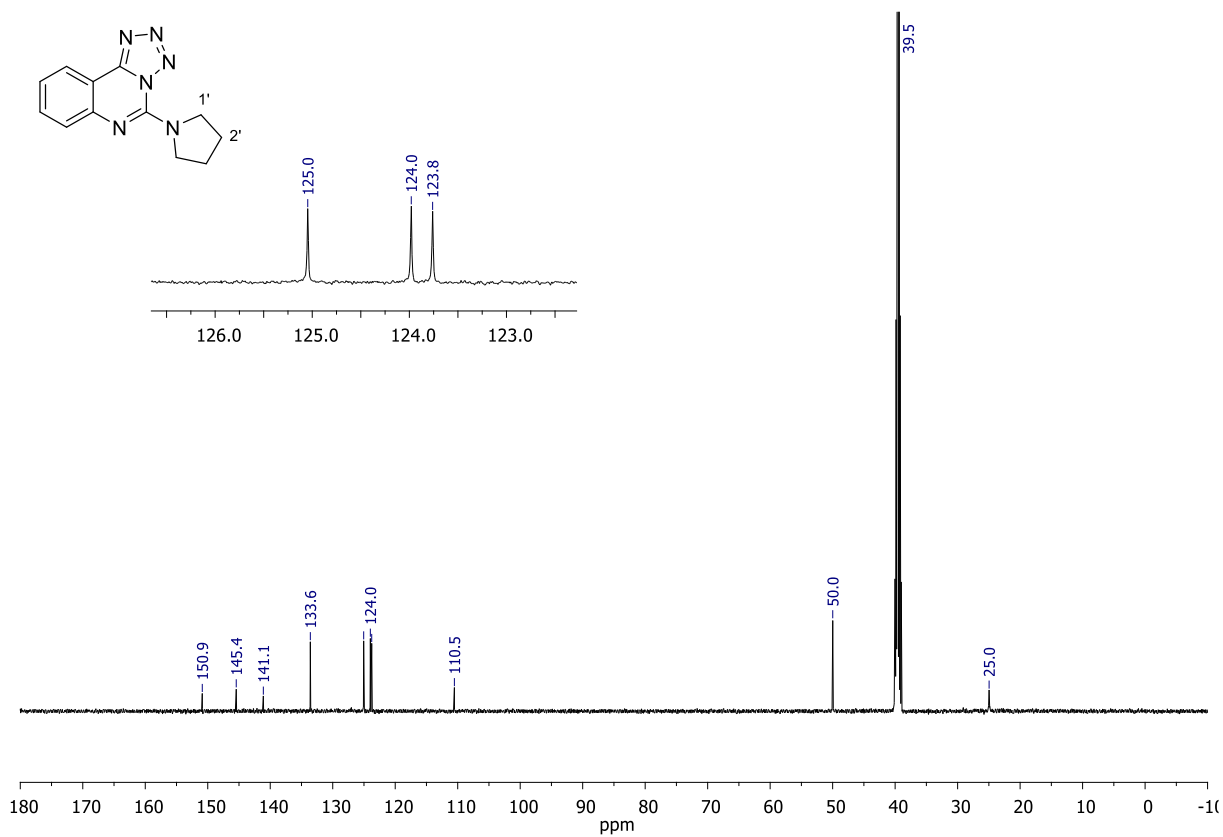
COSY spectrum of compound 4b:



**5-(Pyrrolidin-1-yl)tetrazolo[1,5-c]quinazoline (4c)**  
**<sup>1</sup>H-NMR (500 MHz, DMSO-d<sub>6</sub>) spectrum of compound 4c:**

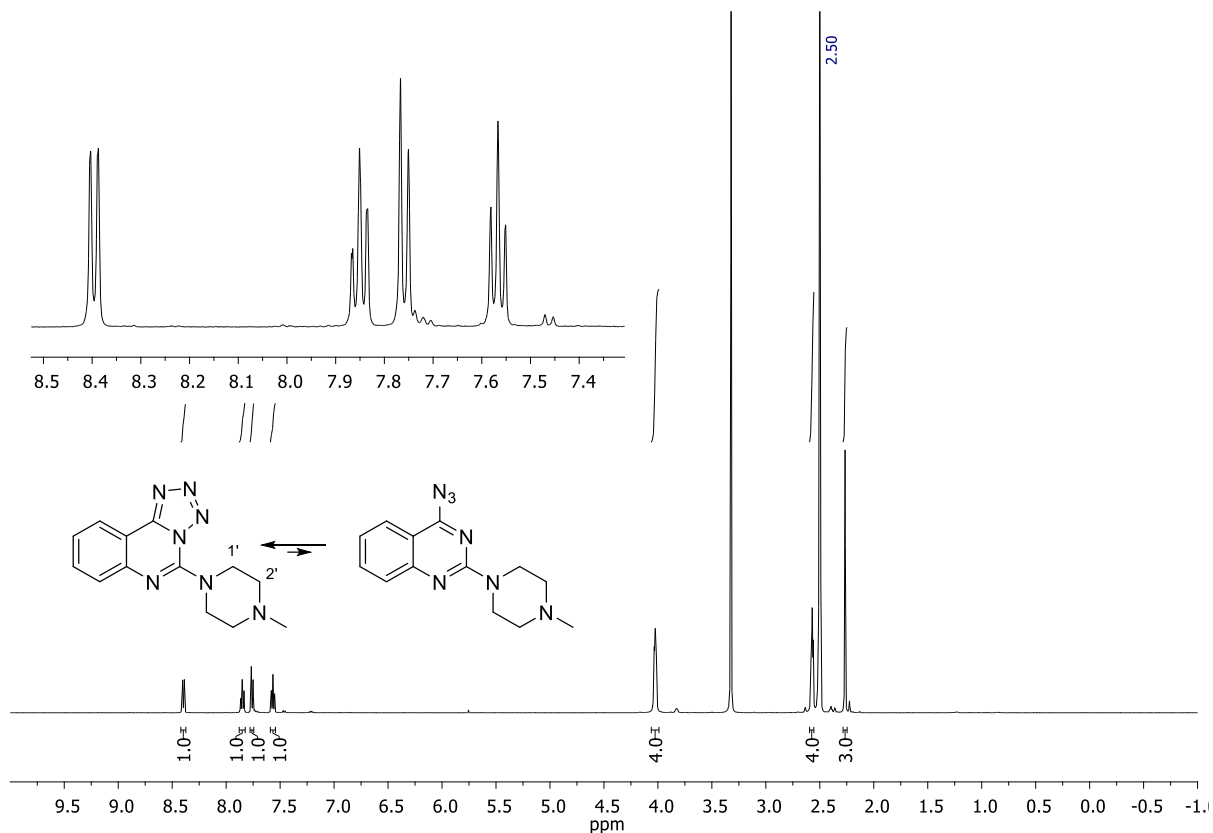


**<sup>13</sup>C-NMR (125.7 MHz, DMSO-d<sub>6</sub>) spectrum of compound 4c:**

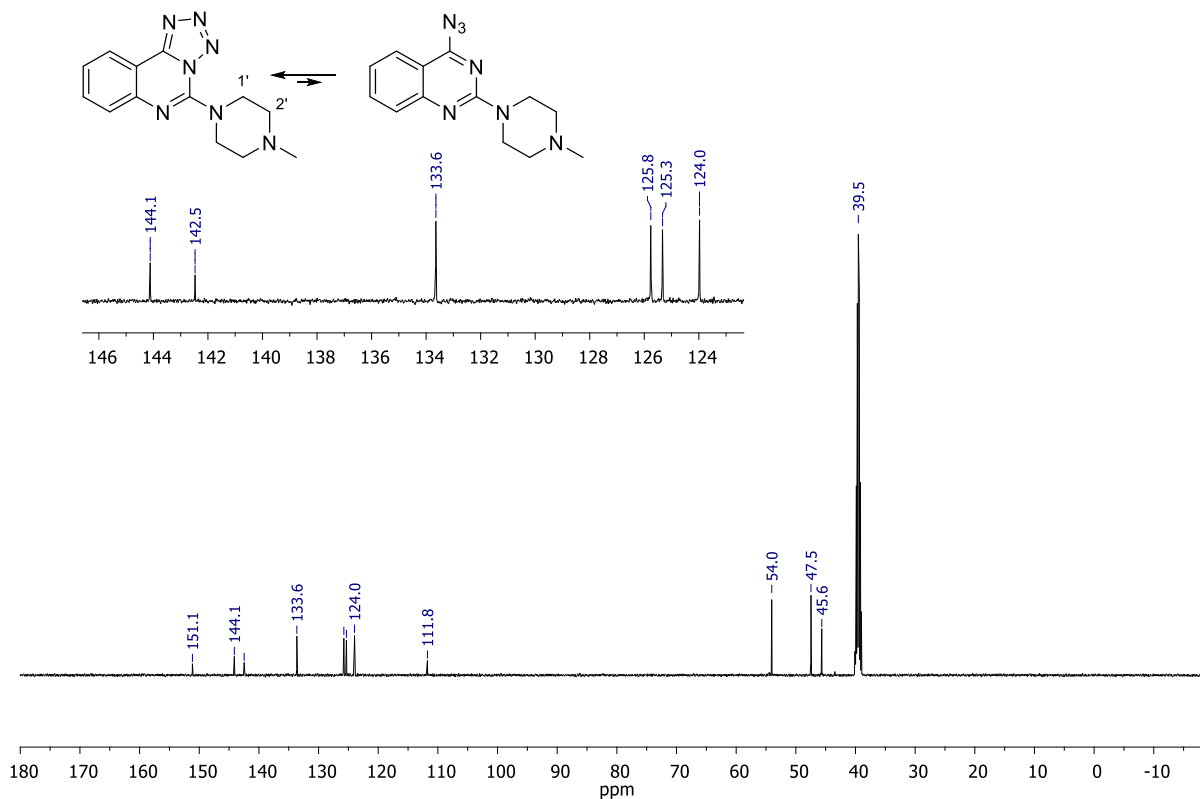


**Tautomeric mixture of 5-(4-methylpiperazin-1-yl)tetrazolo[1,5-c]quinazoline (4d-T) and 4-azido-2-(4-methylpiperazin-1-yl)quinazoline (4d-A)**

**<sup>1</sup>H-NMR (500 MHz, DMSO-d<sub>6</sub>) spectrum of compound 4d:**



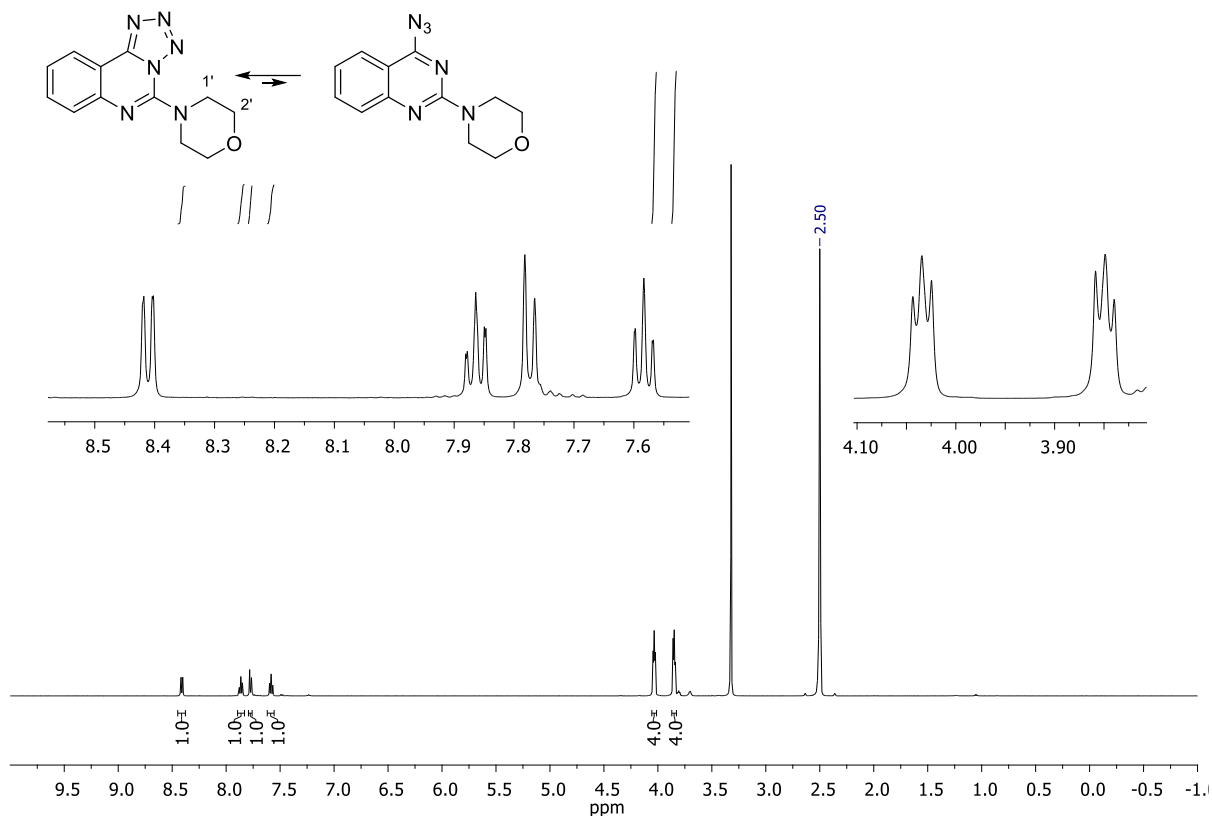
**<sup>13</sup>C-NMR (125.7 MHz, DMSO-d<sub>6</sub>) spectrum of compound 4d:**



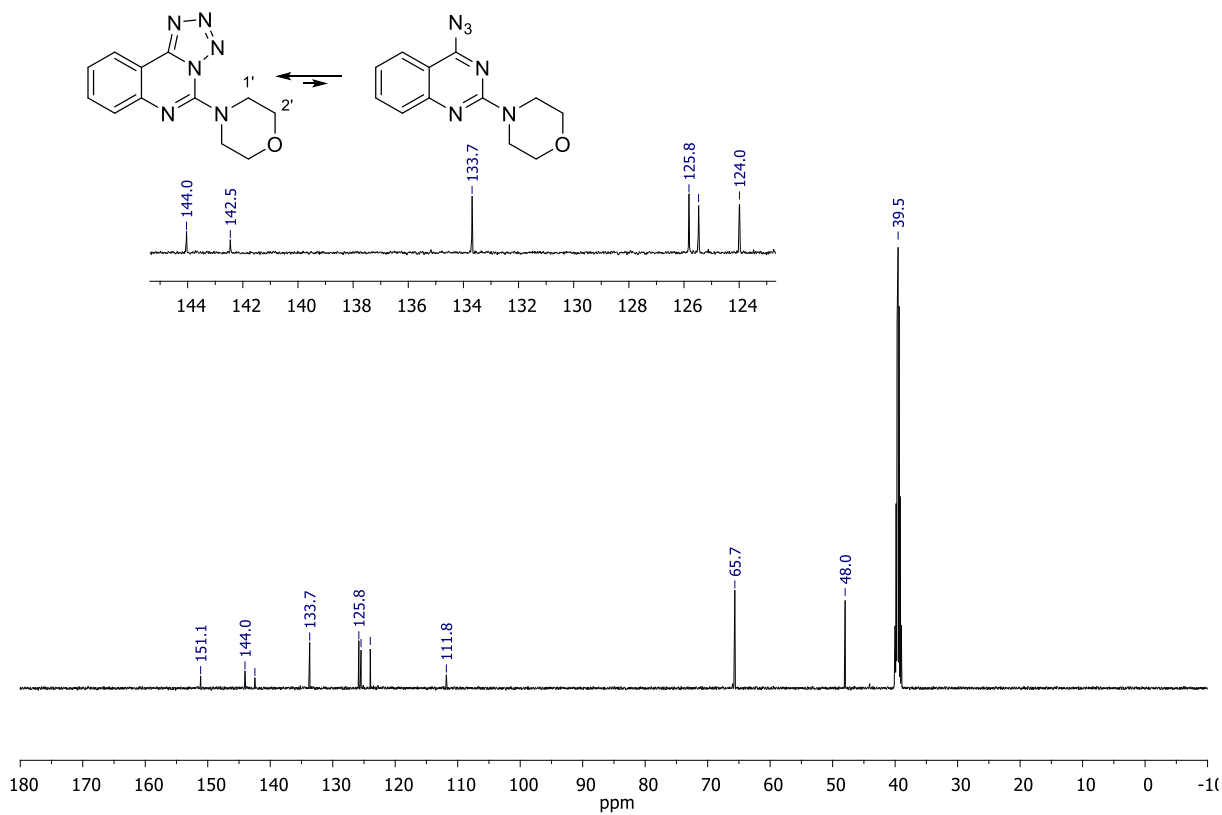


Tautomeric mixture of 5-(morpholin-4-yl)tetrazolo[1,5-c]quinazoline (4e-T) and 4-azido-2-(morpholin-4-yl)quinazoline (4e-A)

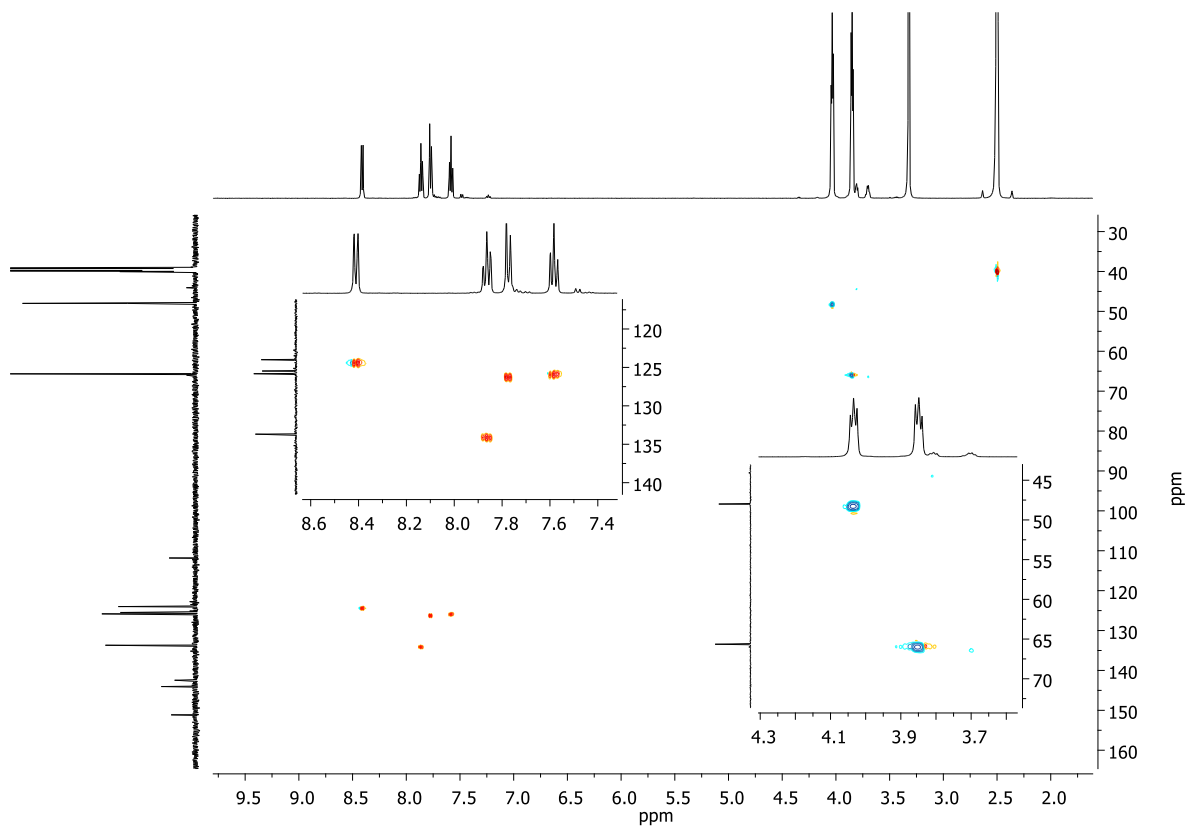
$^1\text{H-NMR}$  (500 MHz,  $\text{DMSO-d}_6$ ) spectrum of compound 4e:



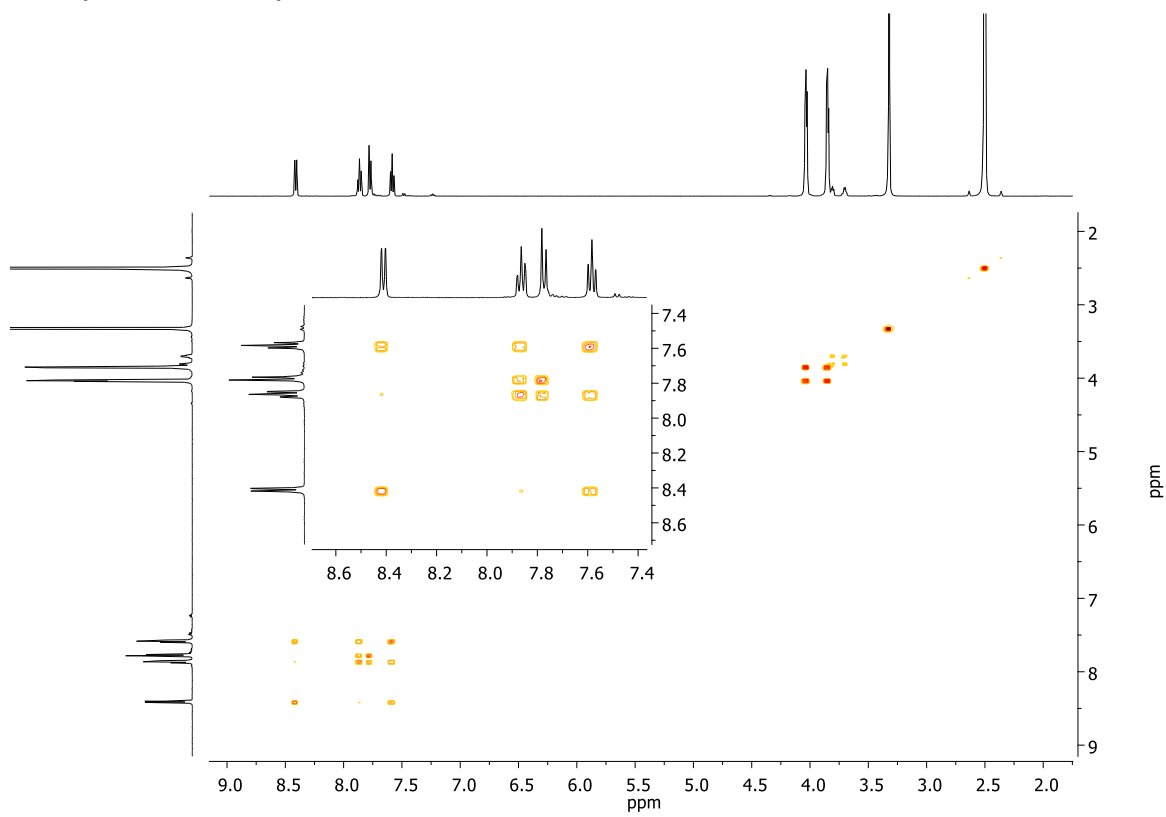
$^{13}\text{C-NMR}$  (125.7 MHz,  $\text{DMSO-d}_6$ ) spectrum of compound 4e:



HSQC spectrum of compound 4e:

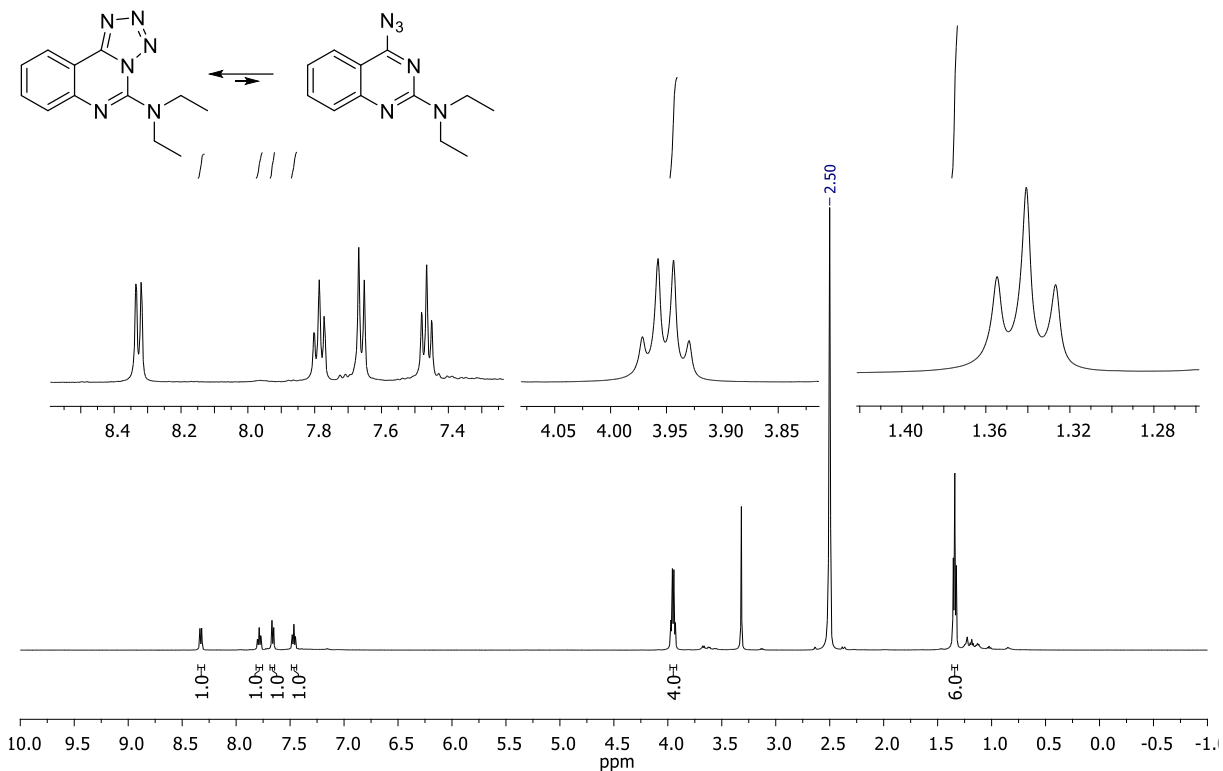


COSY spectrum of compound 4e:

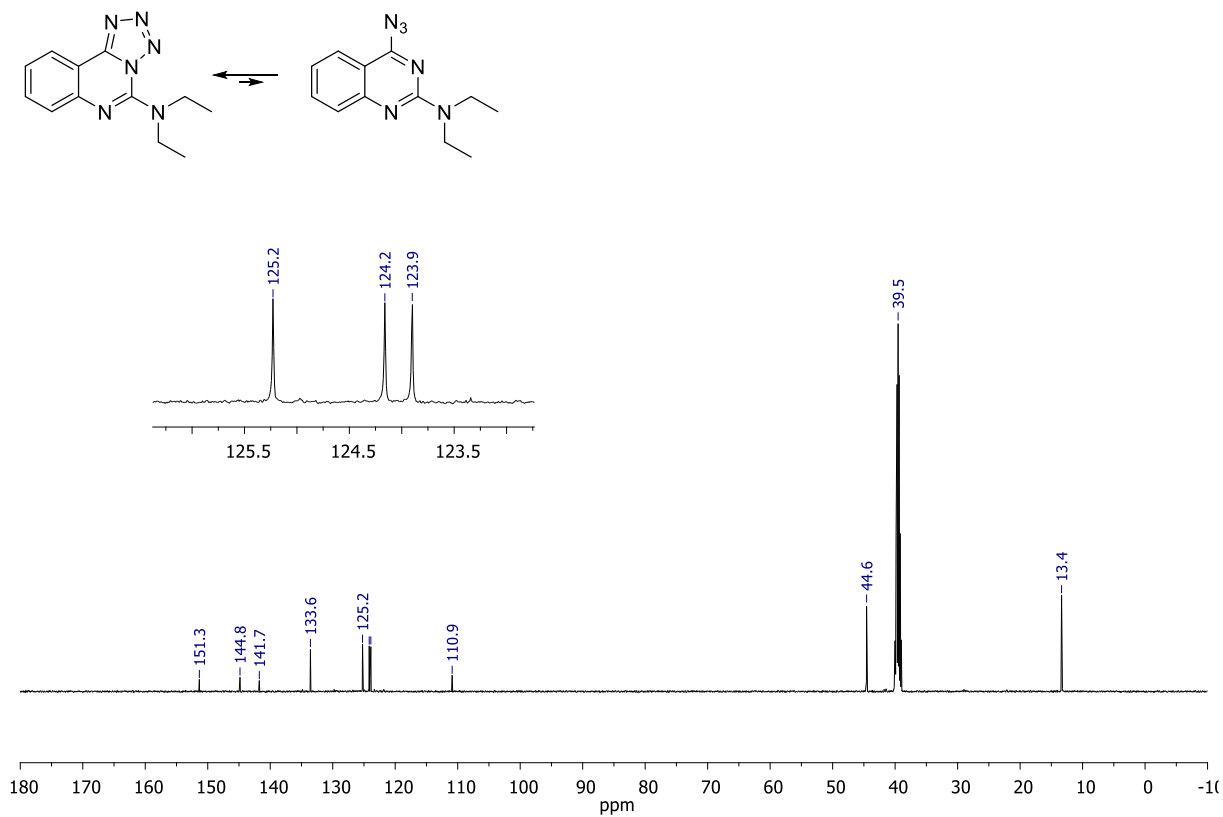


**Tautomeric mixture of 5-(diethylamino)tetrazolo[1,5-c]quinazoline (4f-T) and 4-azido-2-(diethylamino)quinazoline (4f-A)**

**$^1\text{H-NMR}$  (500 MHz,  $\text{DMSO-d}_6$ ) spectrum of compound 4f:**

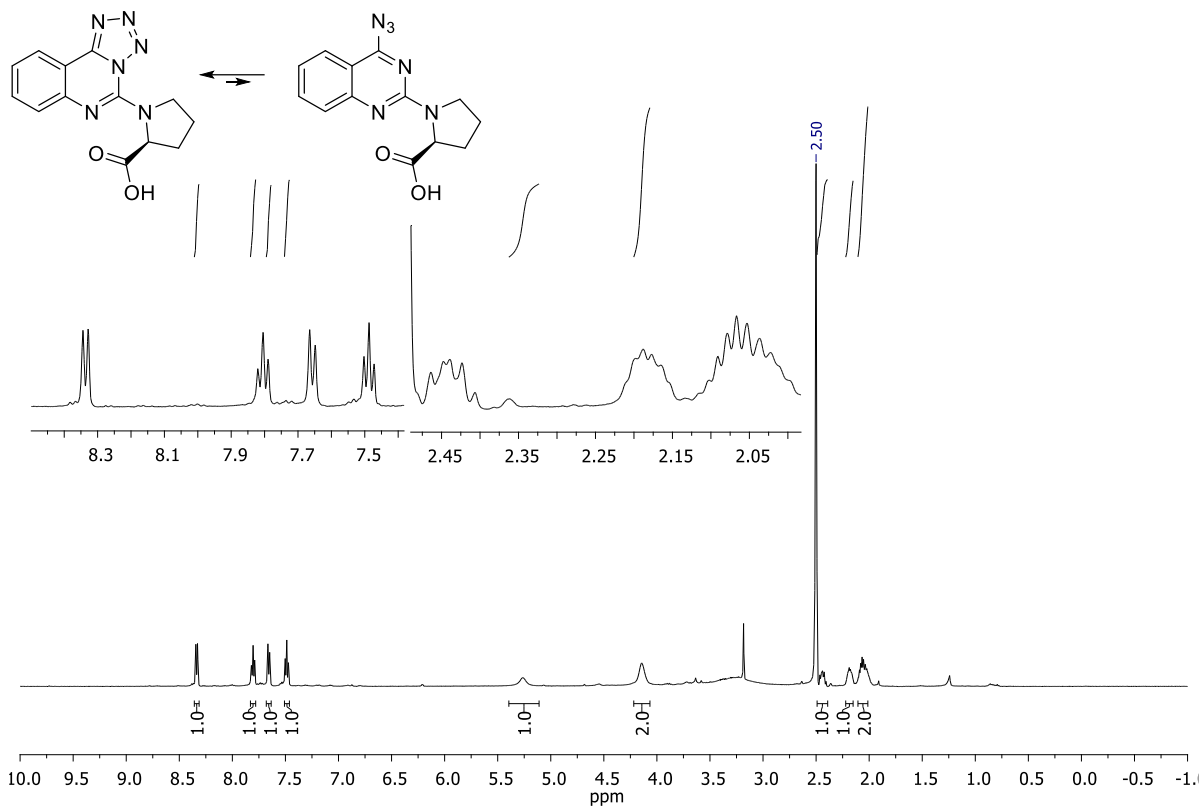


**$^{13}\text{C-NMR}$  (125.7 MHz,  $\text{DMSO-d}_6$ ) spectrum of compound 4f:**

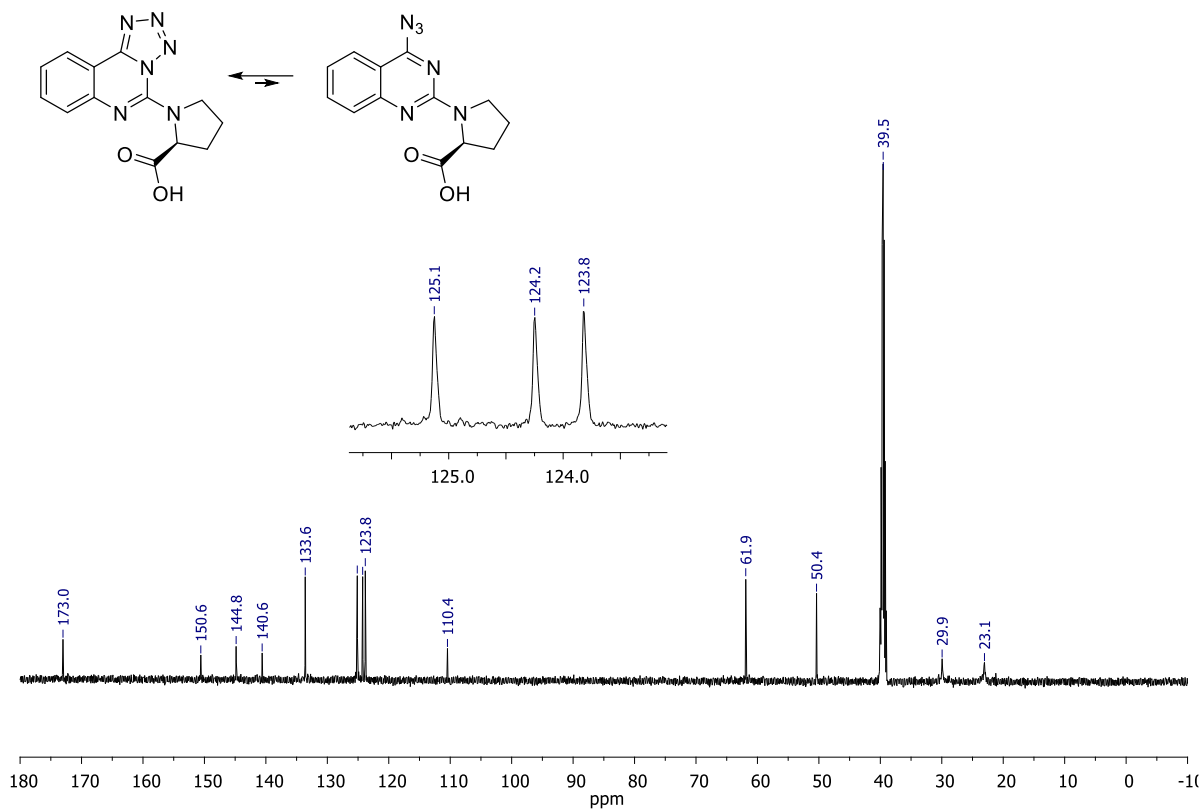


Tautomeric mixture of tetrazolo[1,5-c]quinazolin-5-yl-L-proline (4g-T) and (4-azidoquinazolin-2-yl)-L-proline (4g-A)

$^1\text{H-NMR}$  (500 MHz,  $\text{DMSO-d}_6$ , 50 °C) spectrum of compound 4g:



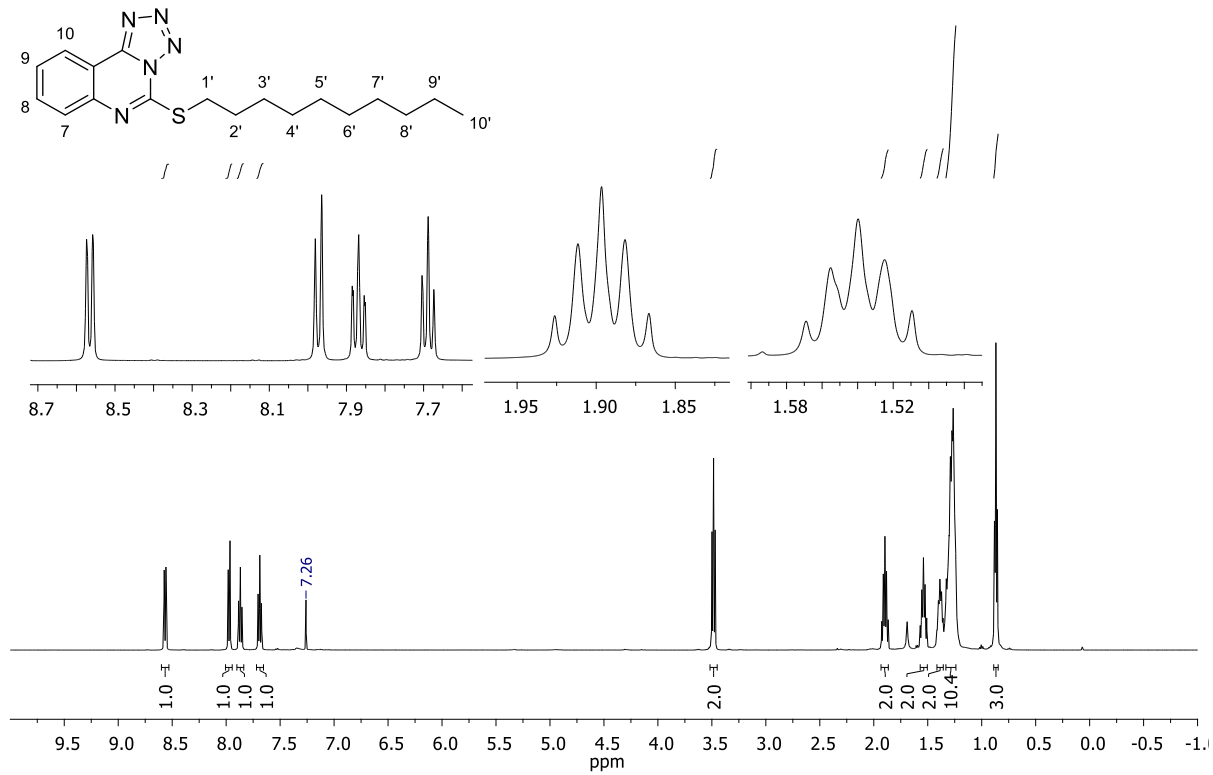
$^{13}\text{C-NMR}$  (125.7 MHz,  $\text{DMSO-d}_6$ , 50 °C) spectrum of compound 4g:



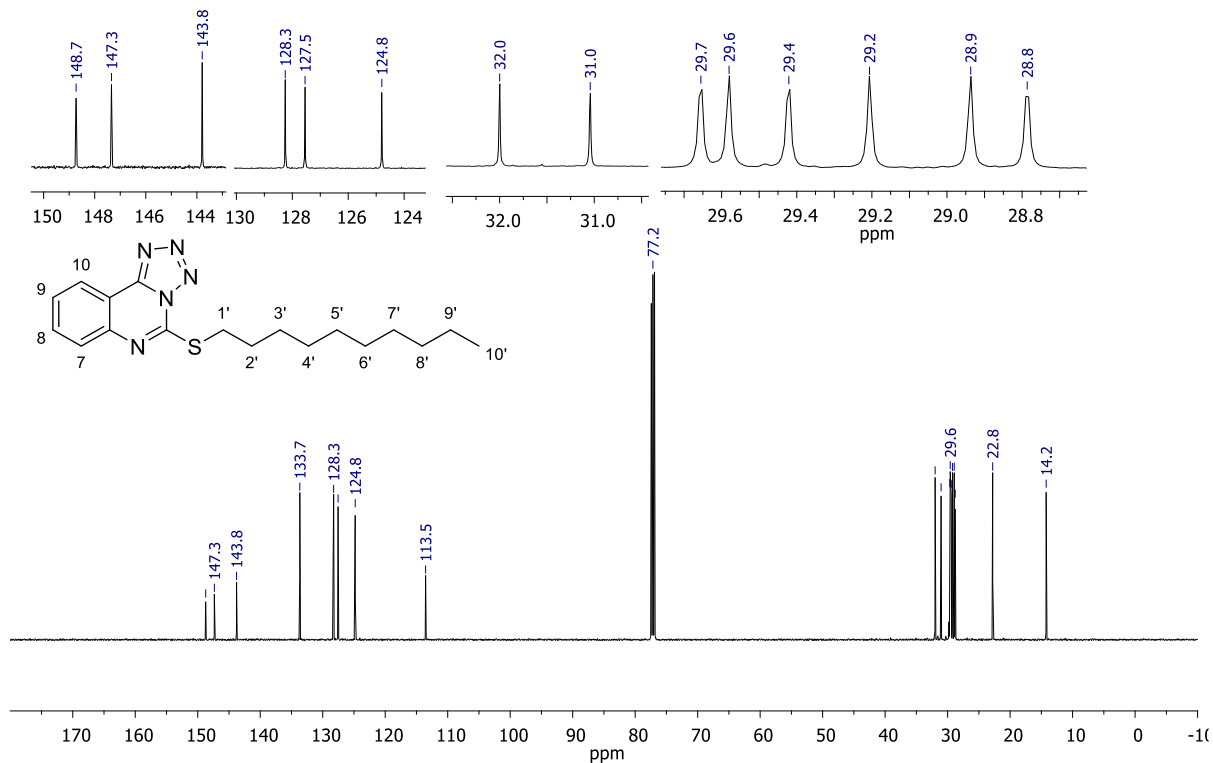
# 5-(Alkylthio)tetrazolo[1,5-c]quinazolines

## 5-(Decylthio)tetrazolo[1,5-c]quinazoline (6a)

$^1\text{H-NMR}$  (500 MHz,  $\text{CDCl}_3$ ) spectrum of compound 6a:

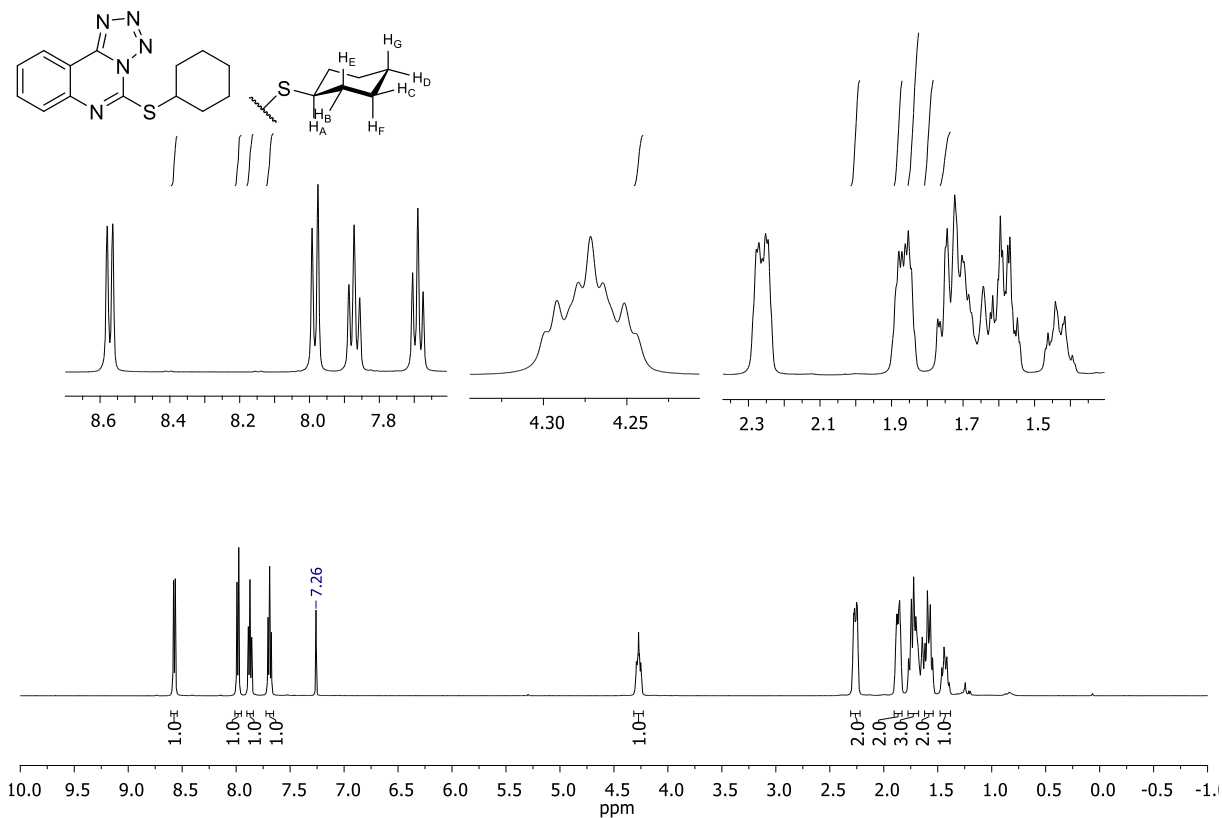


$^{13}\text{C-NMR}$  (125.7 MHz,  $\text{CDCl}_3$ ) spectrum of compound 6a:

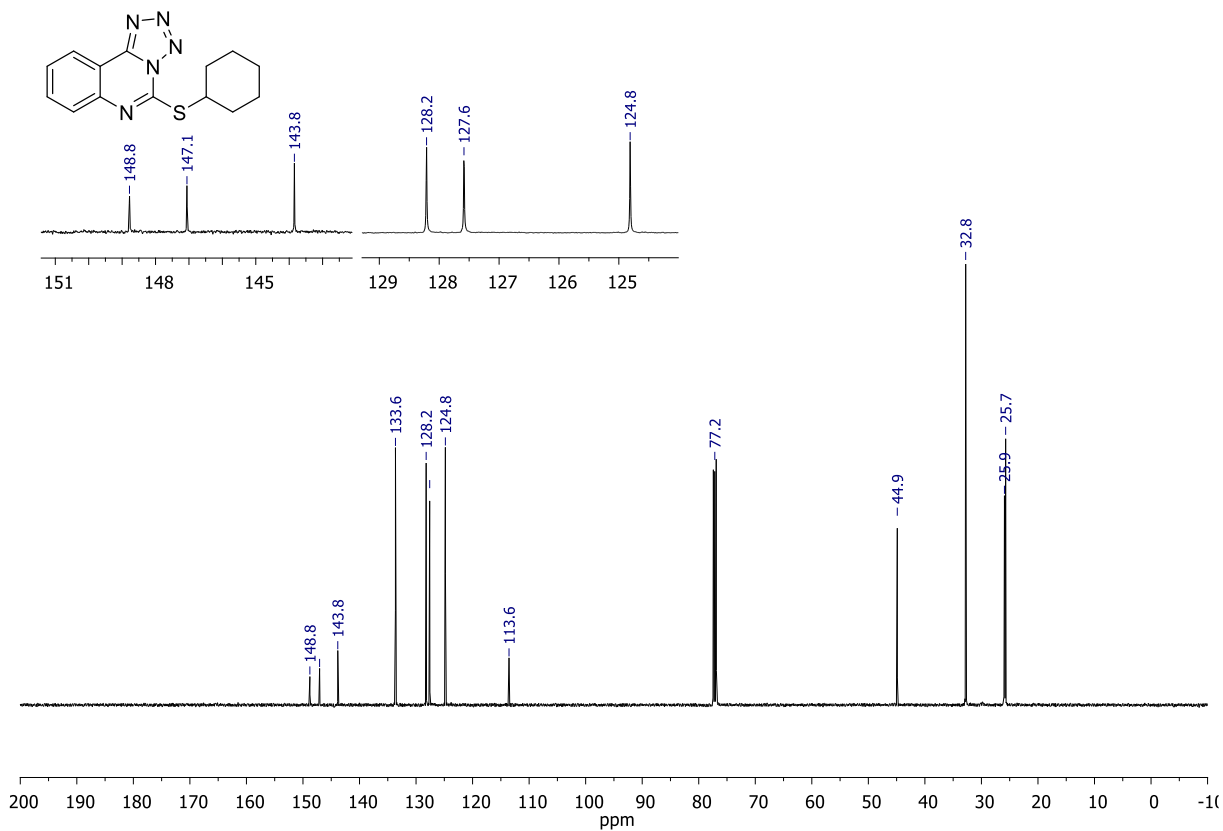


## 5-(Cyclohexylthio)tetrazolo[1,5-c]quinazoline(6b)

$^1\text{H-NMR}$  (500 MHz,  $\text{CDCl}_3$ ) spectrum of compound 6b:

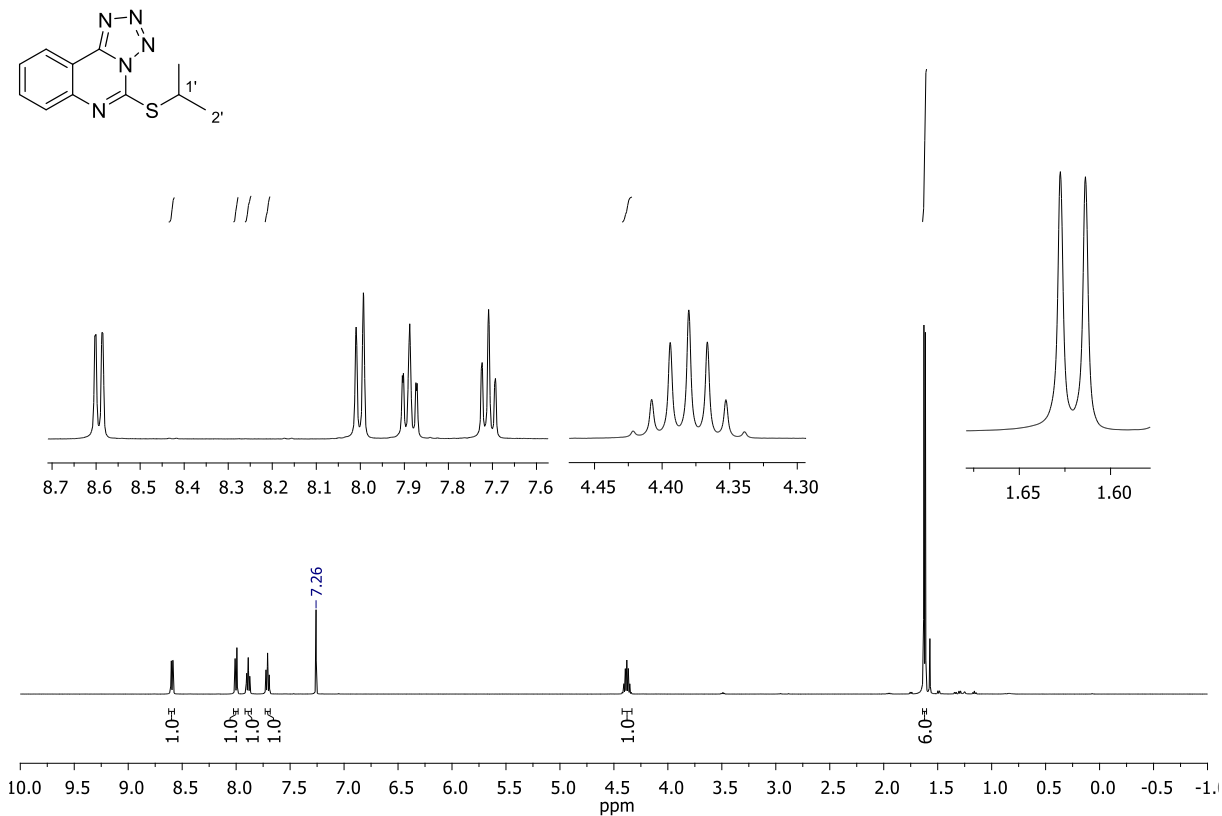


$^{13}\text{C-NMR}$  (125.7 MHz,  $\text{CDCl}_3$ ) spectrum of compound 6b:

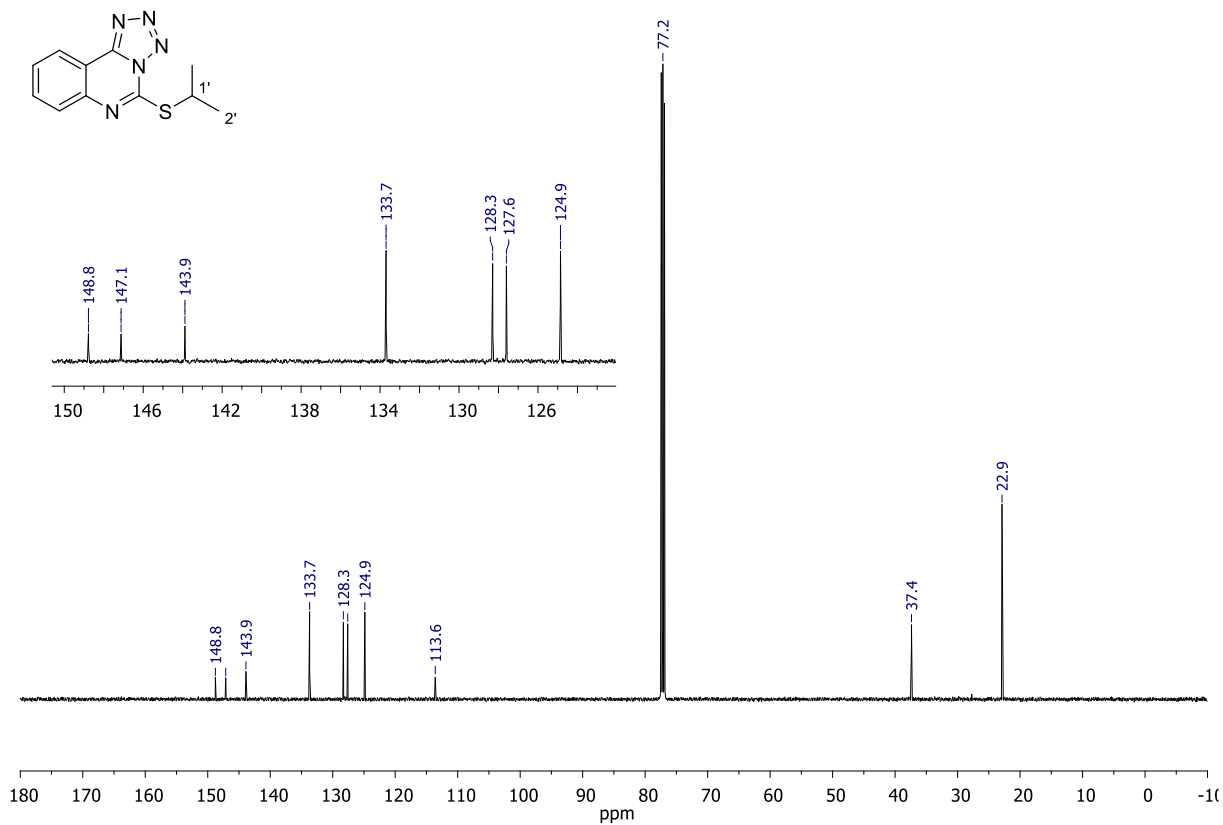


### 5-(Isopropylthio)tetrazolo[1,5-c]quinazoline (6c)

<sup>1</sup>H-NMR (500 MHz, CDCl<sub>3</sub>) spectrum of compound 6c:

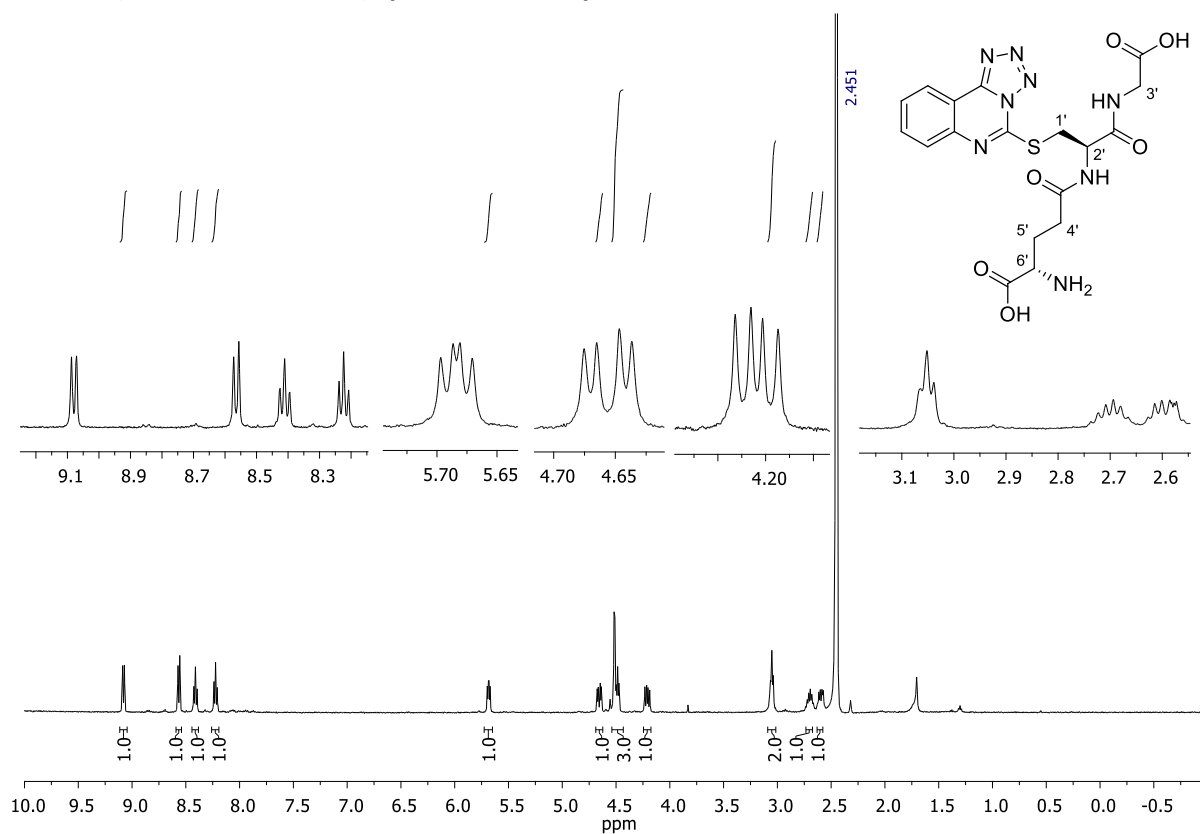


<sup>13</sup>C-NMR (125.7 MHz, CDCl<sub>3</sub>) spectrum of compound 6c:

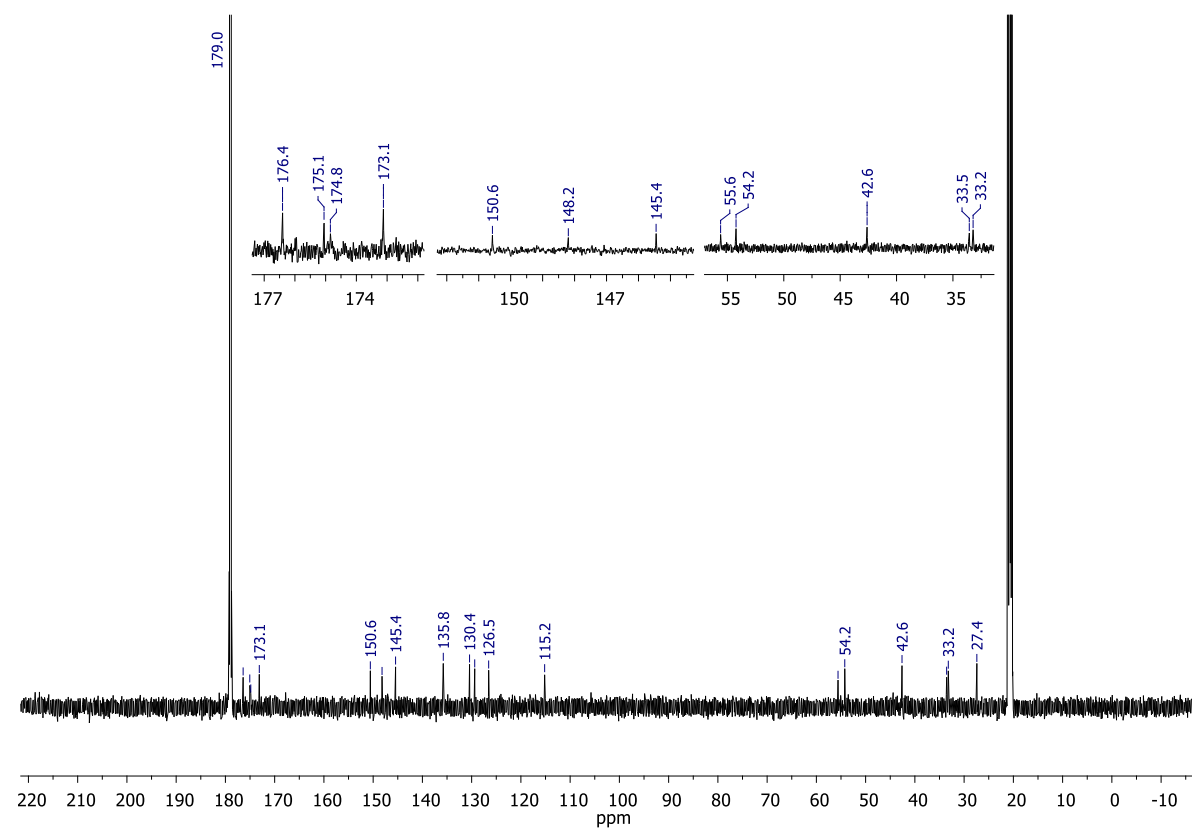


## Glutathione-tetrazolo[1,5-c]quinazoline conjugate 6d

$^1\text{H-NMR}$  (500 MHz,  $\text{CD}_3\text{COOD}$ ) spectrum of compound 6d:



$^{13}\text{C-NMR}$  (125.7 MHz,  $\text{CD}_3\text{COOD}$ ) spectrum of compound 6d:

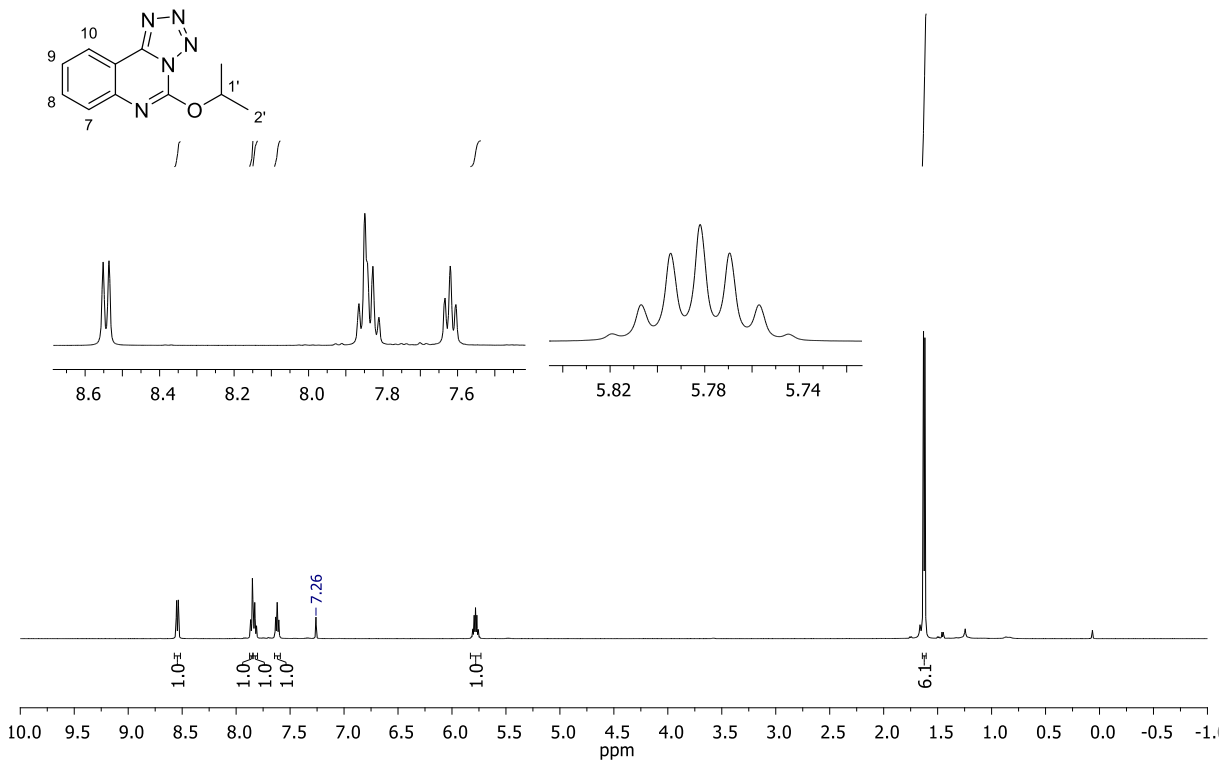




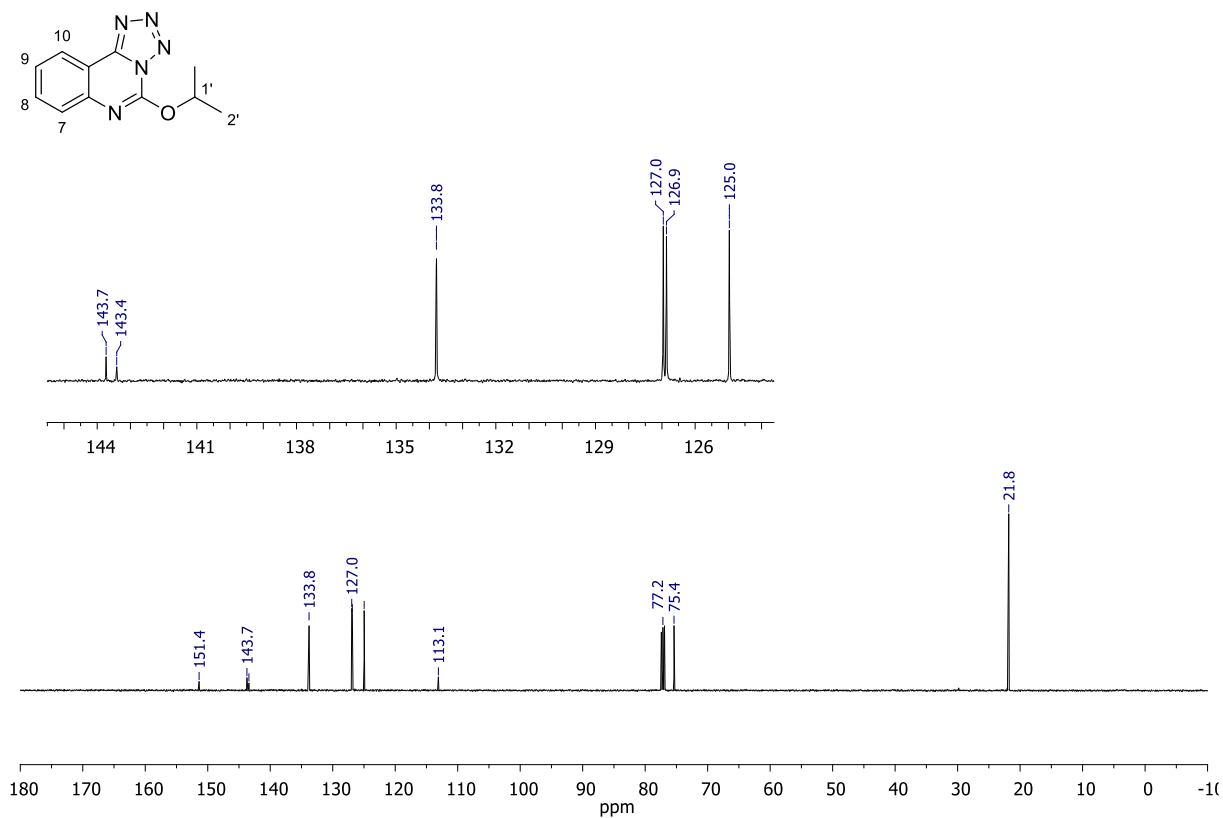
## 5-(Alkyloxy)tetrazolo[1,5-c]quinazolines

### 5-(Isopropoxy)tetrazolo[1,5-c]quinazoline (7a)

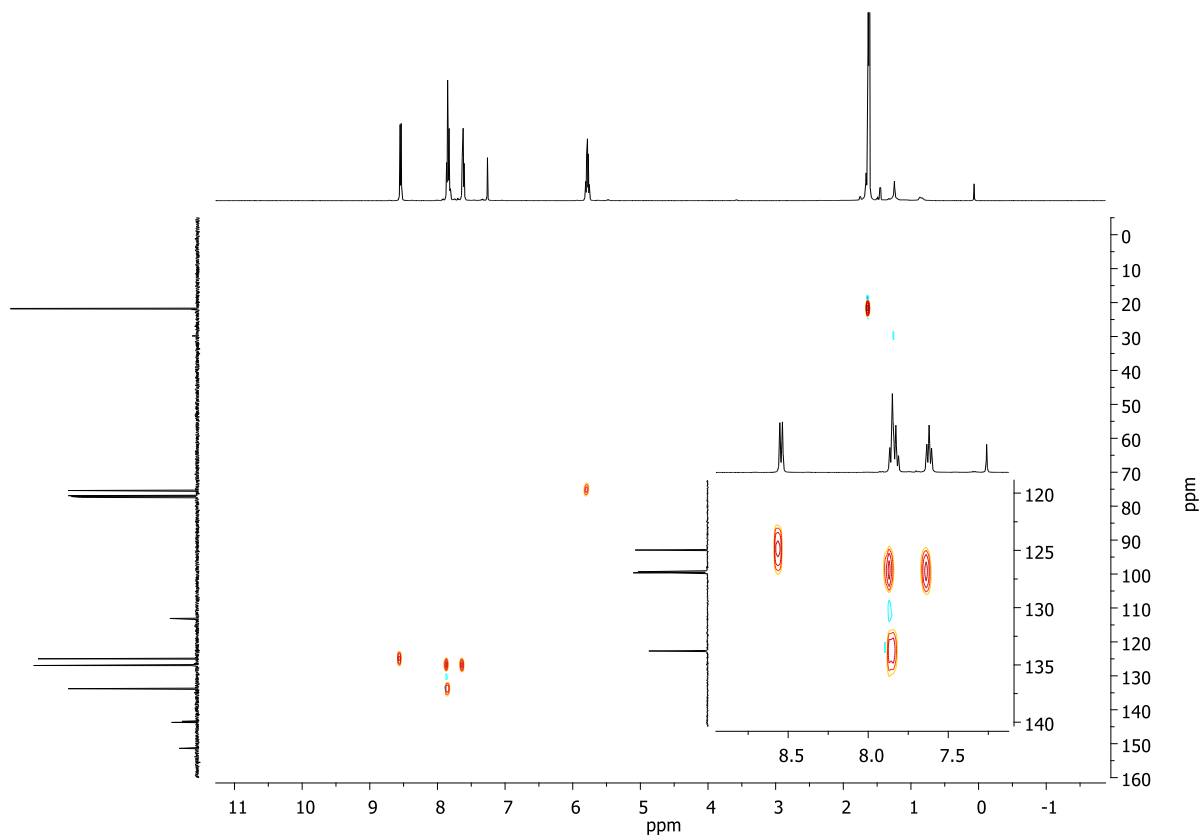
$^1\text{H-NMR}$  (500 MHz,  $\text{CDCl}_3$ ) spectrum of compound 7a:



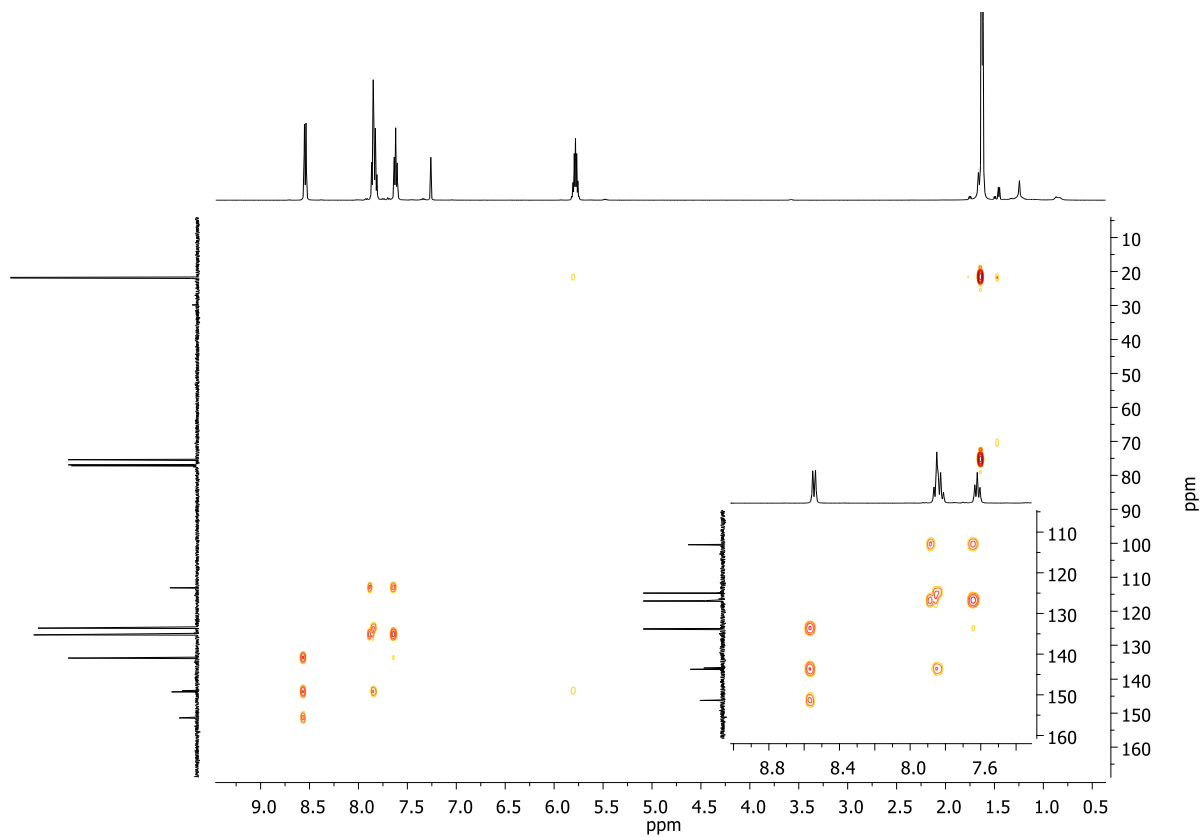
$^{13}\text{C-NMR}$  (125.7 MHz,  $\text{CDCl}_3$ ) spectrum of compound 7a:



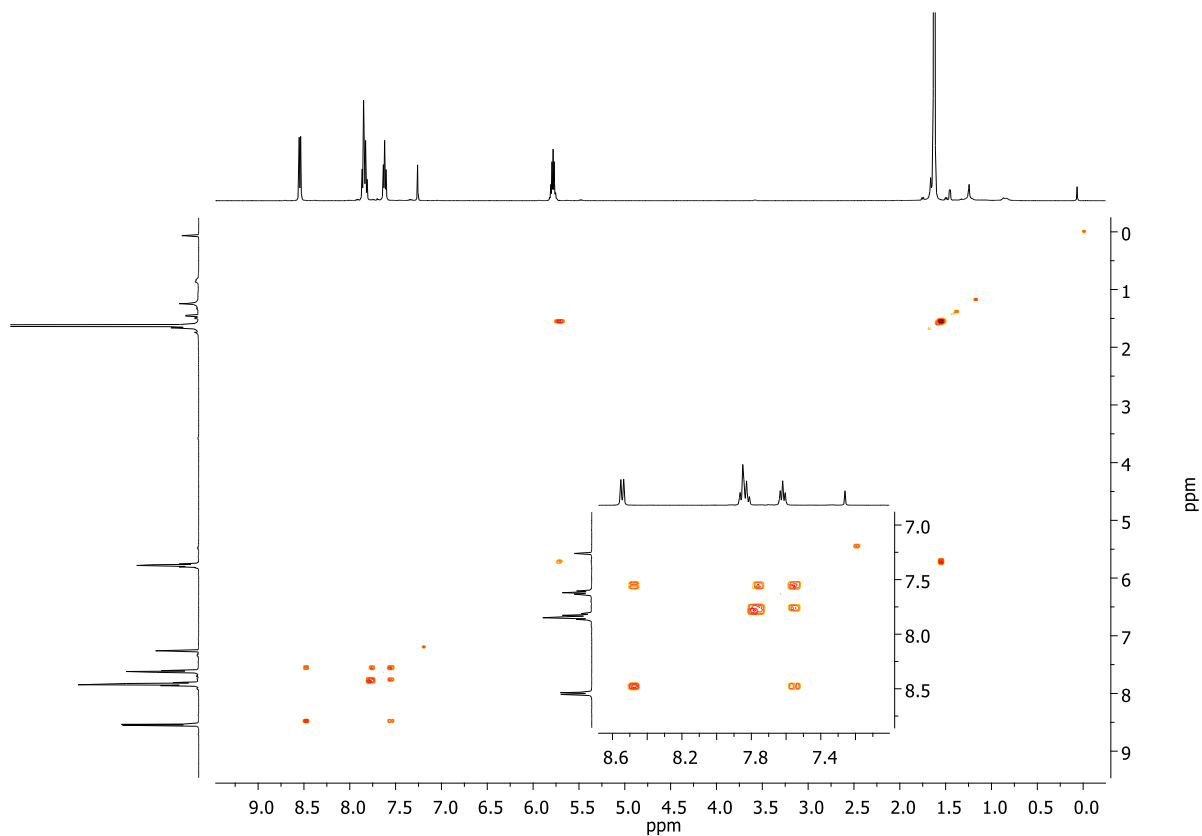
HSQC spectrum of compound 7a:



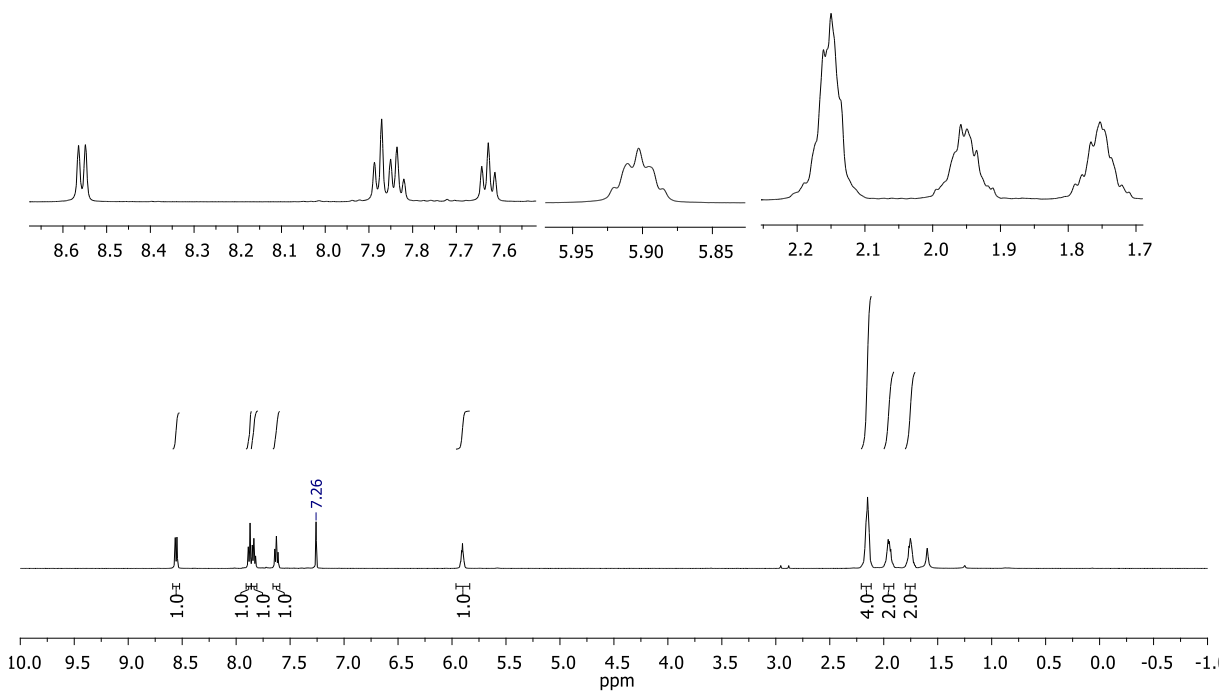
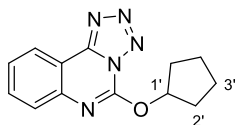
HMBC spectrum of compound 7a:



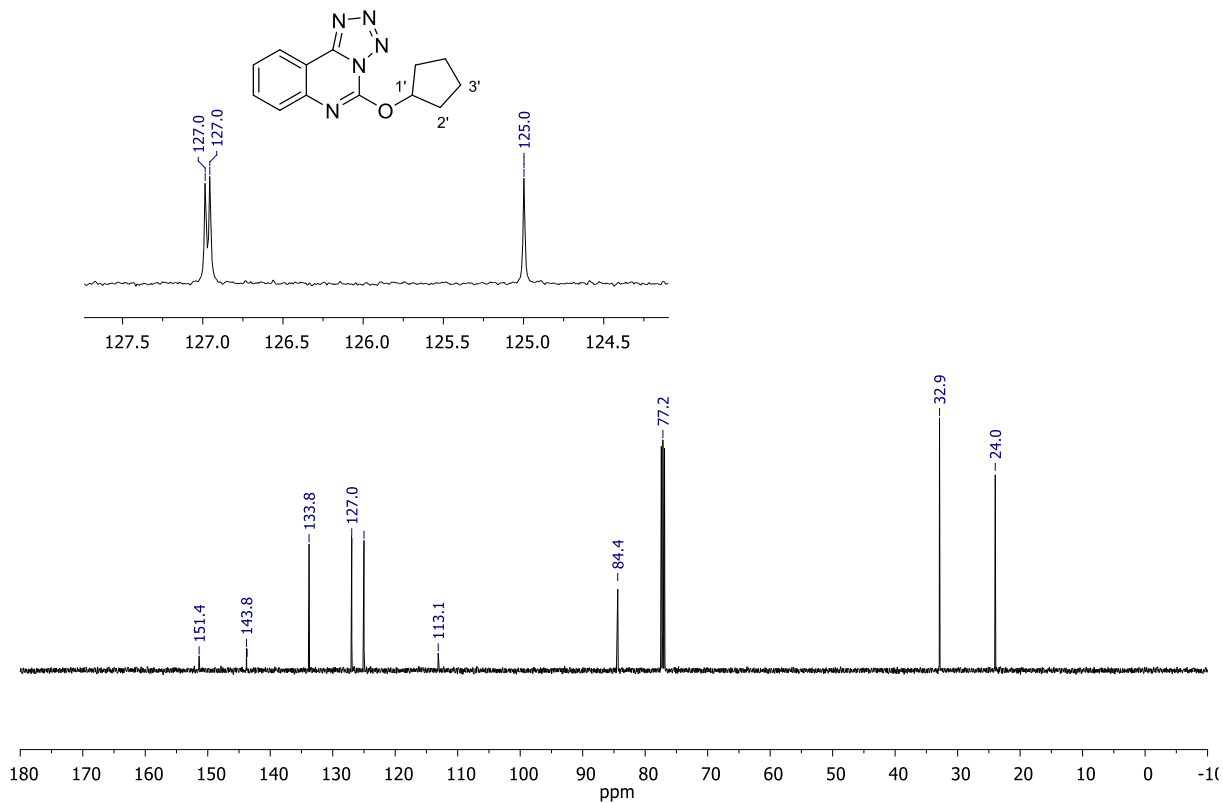
COSY spectrum of compound 7a:



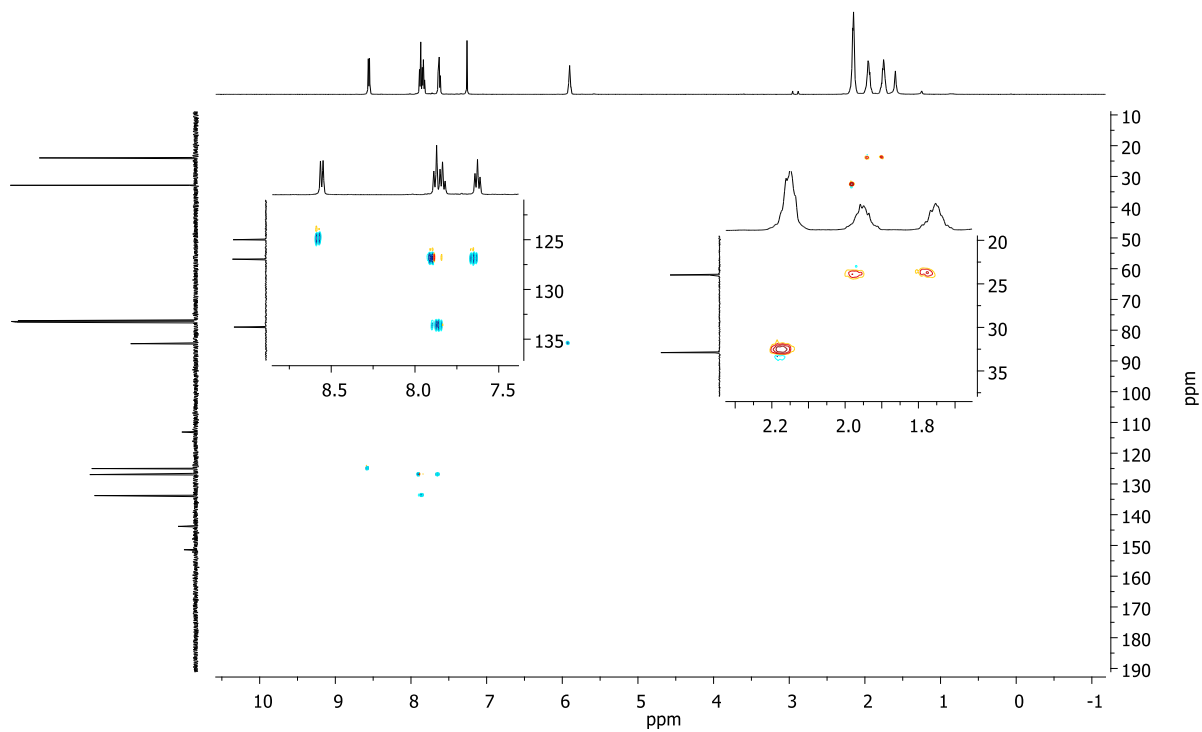
5-(Cyclopentyloxy)tetrazolo[1,5-c]quinazoline (7b)



**<sup>13</sup>C-NMR (125.7 MHz, CDCl<sub>3</sub>) spectrum of compound 7b:**

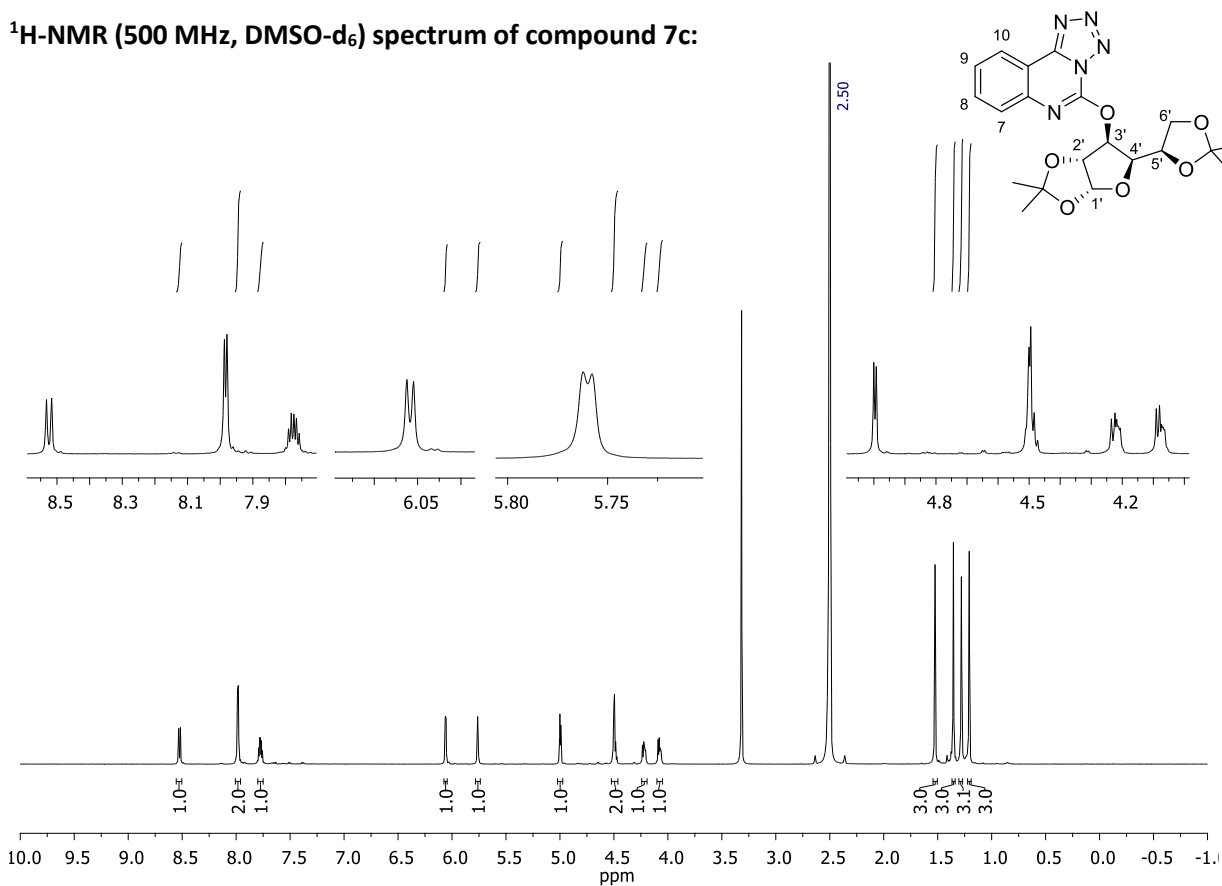


**HSQC spectrum of compound 7b:**

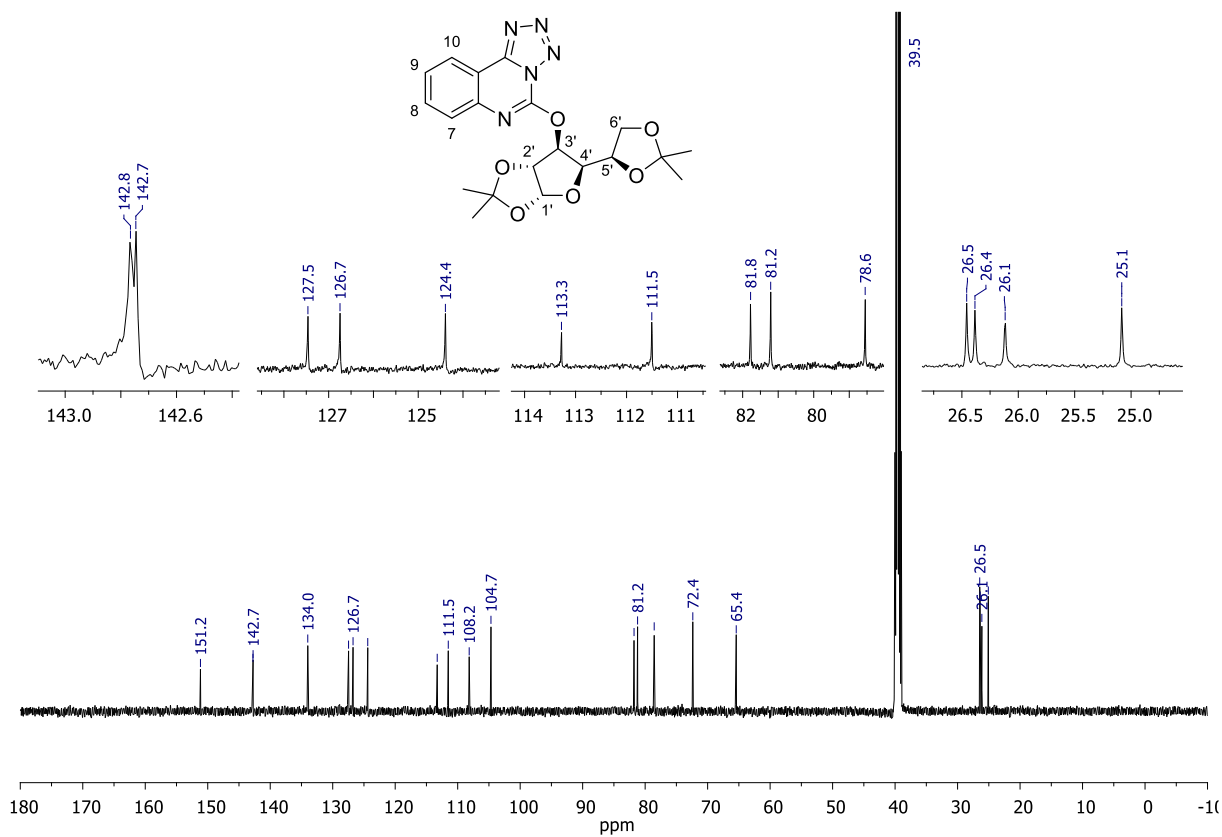


## Diacetone glucose-quinazoline conjugate 7c

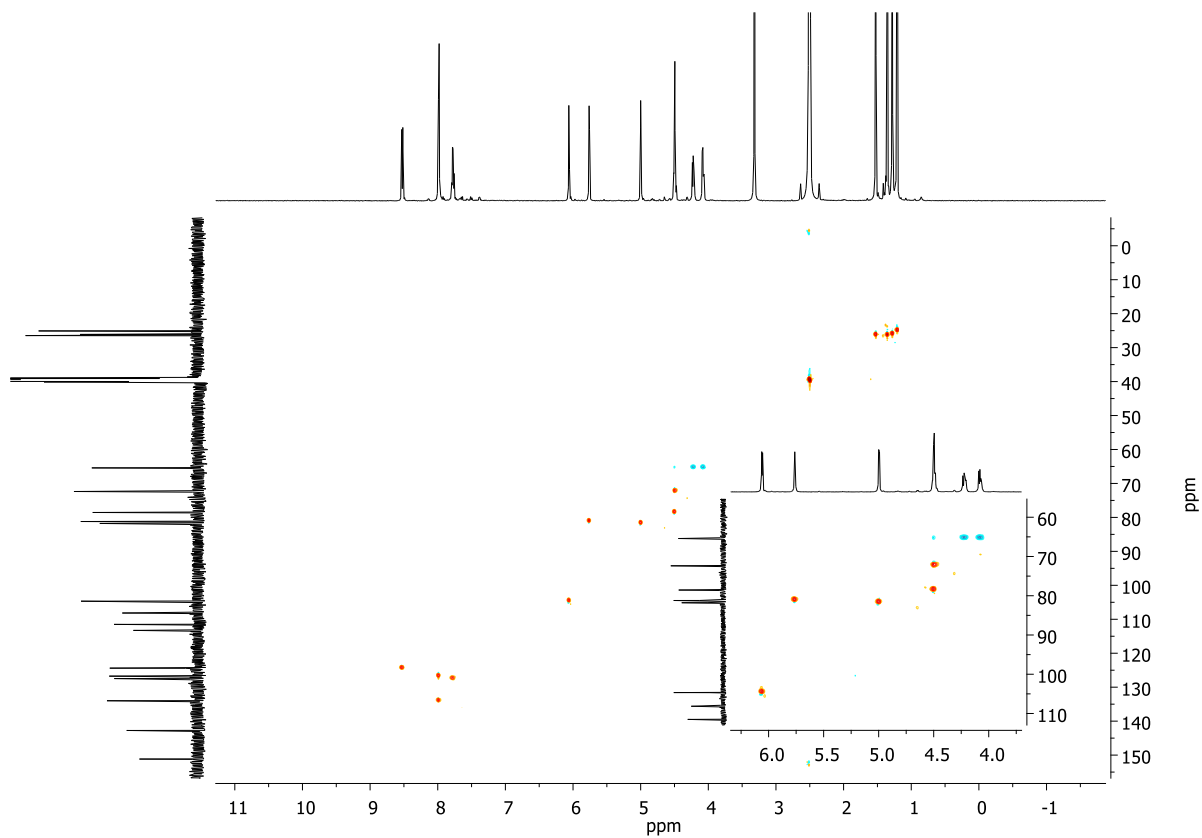
$^1\text{H-NMR}$  (500 MHz,  $\text{DMSO-d}_6$ ) spectrum of compound 7c:



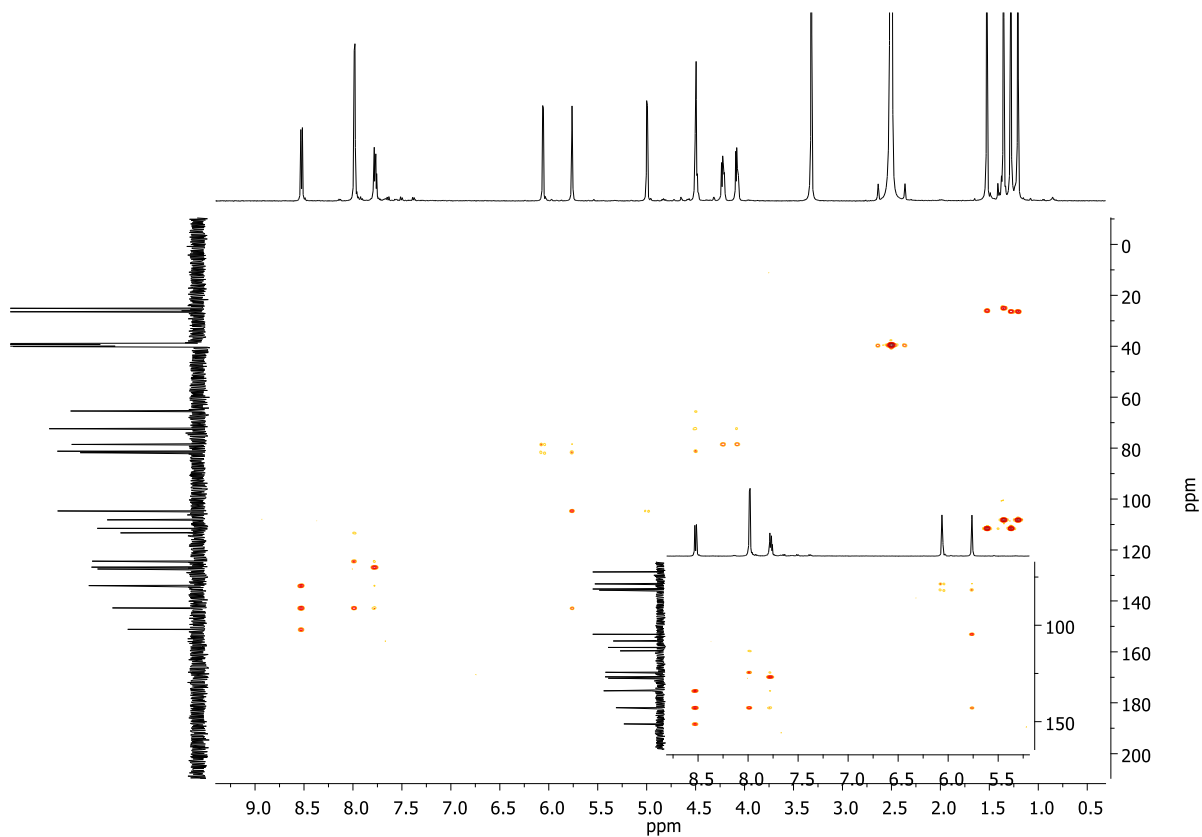
$^{13}\text{C-NMR}$  (125.7 MHz,  $\text{DMSO-d}_6$ ) spectrum of compound 7c:



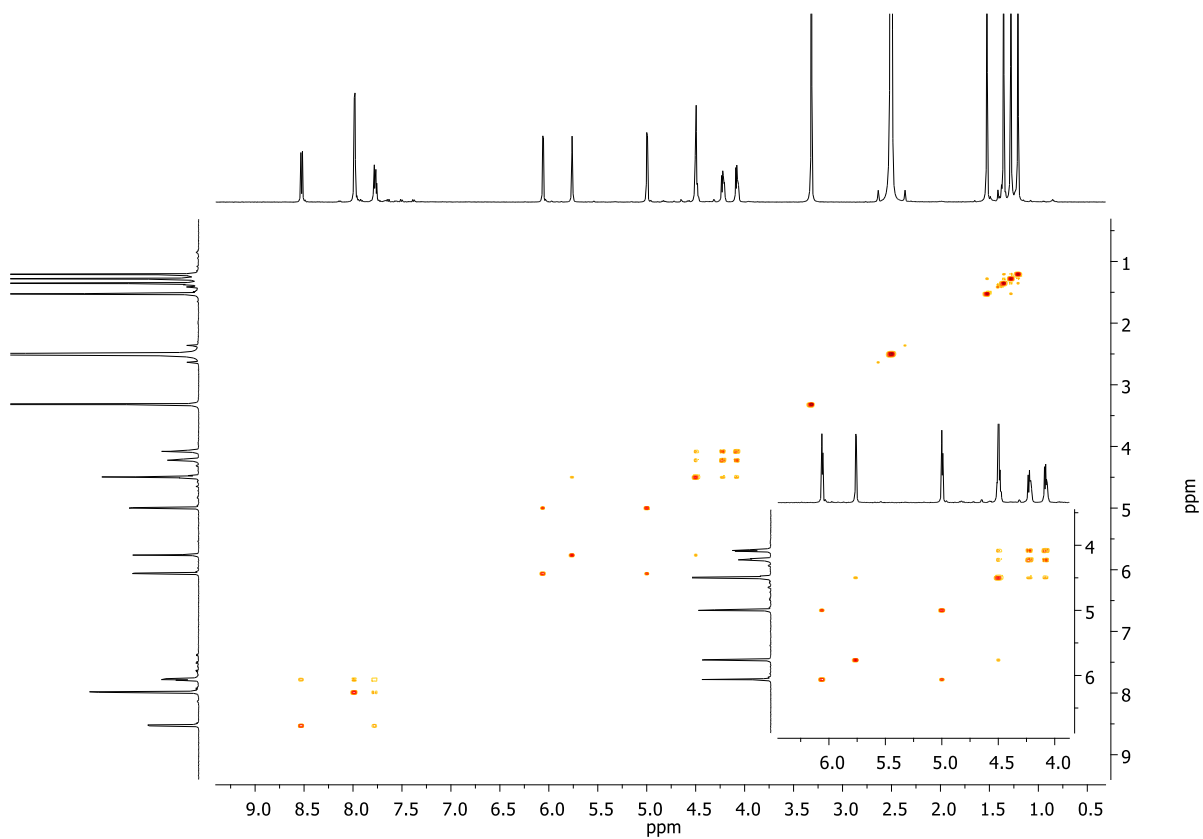
HSQC spectrum of compound 7c:



HMBC spectrum of compound 7c:



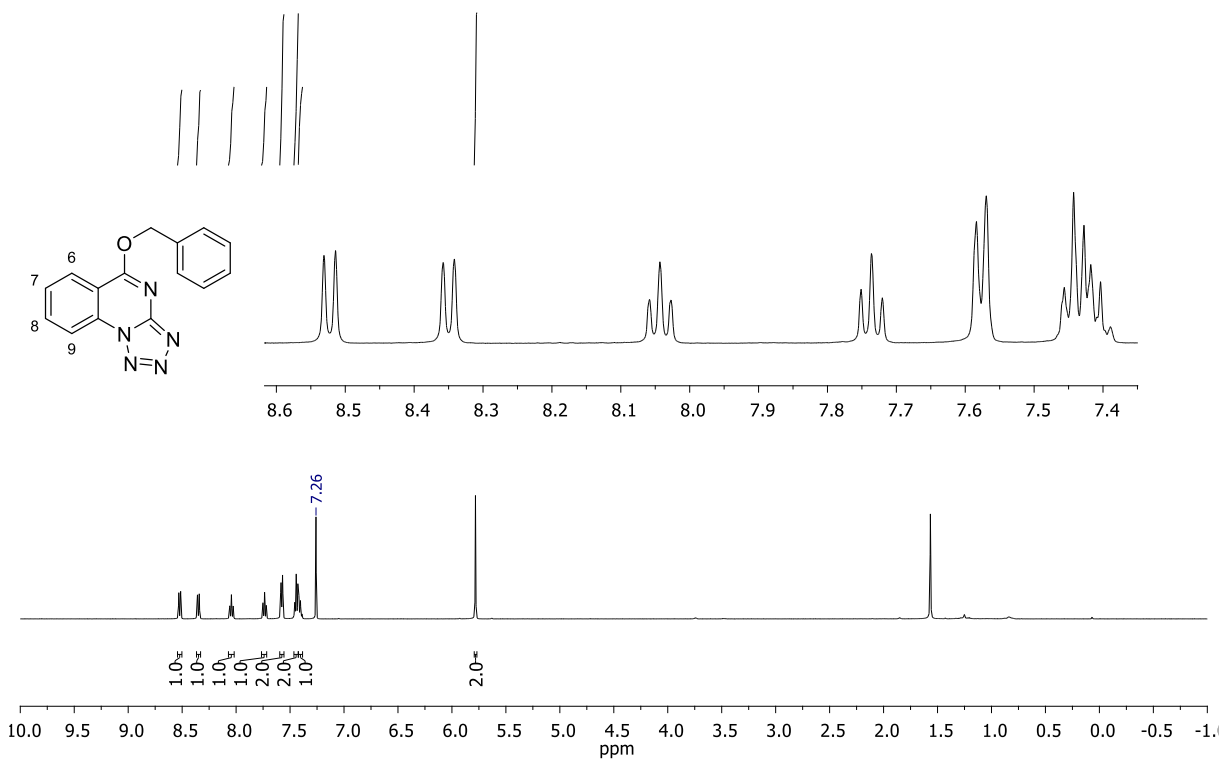
COSY spectrum of compound 7c:



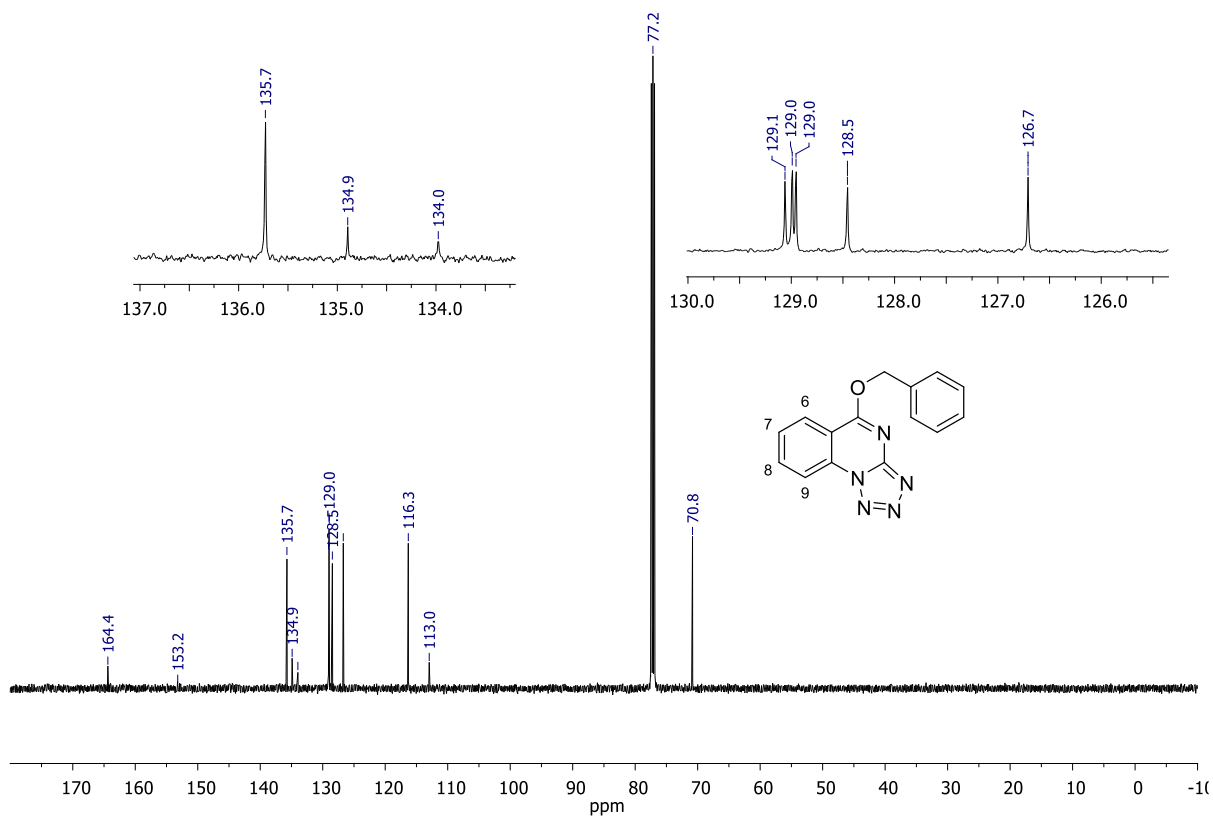
## 5-(Alkyloxy)tetrazolo[1,5-*a*]quinazolines

### 5-(Benzyloxy)tetrazolo[1,5-*a*]quinazoline (9a)

<sup>1</sup>H-NMR (500 MHz, CDCl<sub>3</sub>) spectrum of compound 9a:

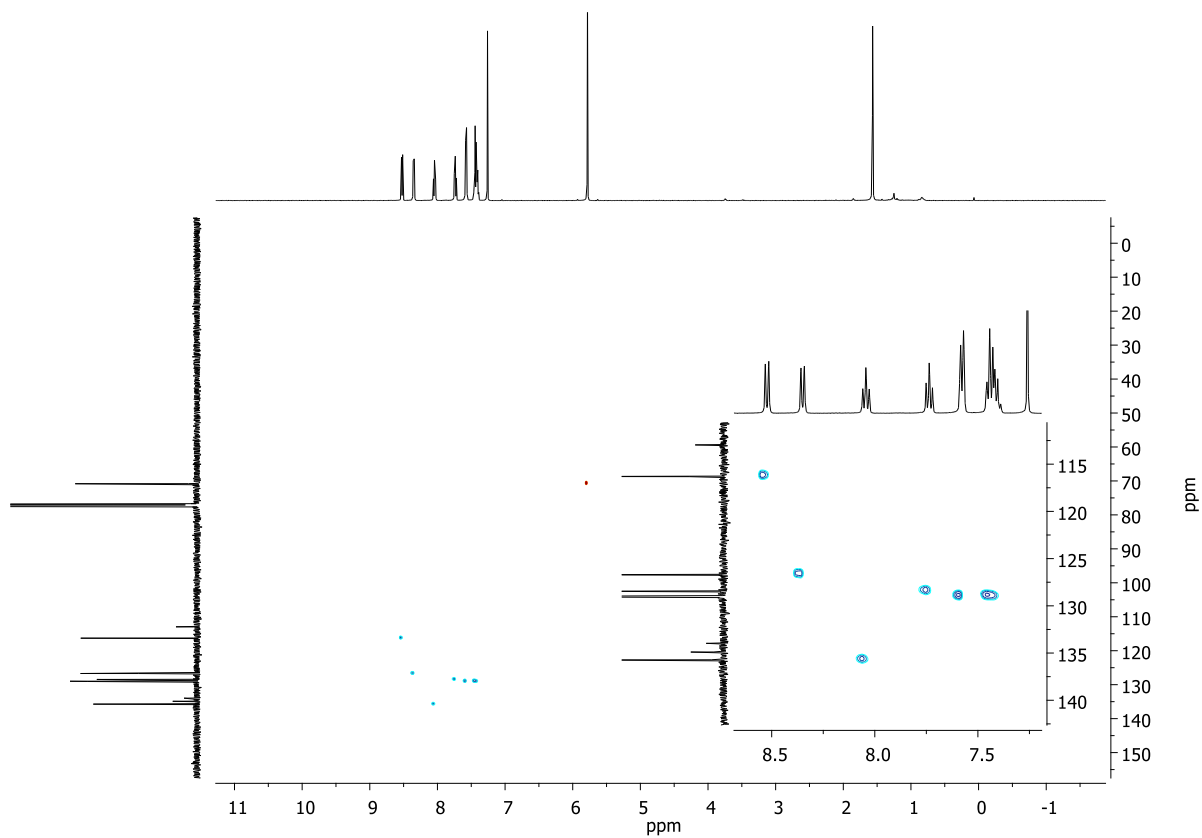


<sup>13</sup>C-NMR (125.7 MHz, CDCl<sub>3</sub>) spectrum of compound 9a:

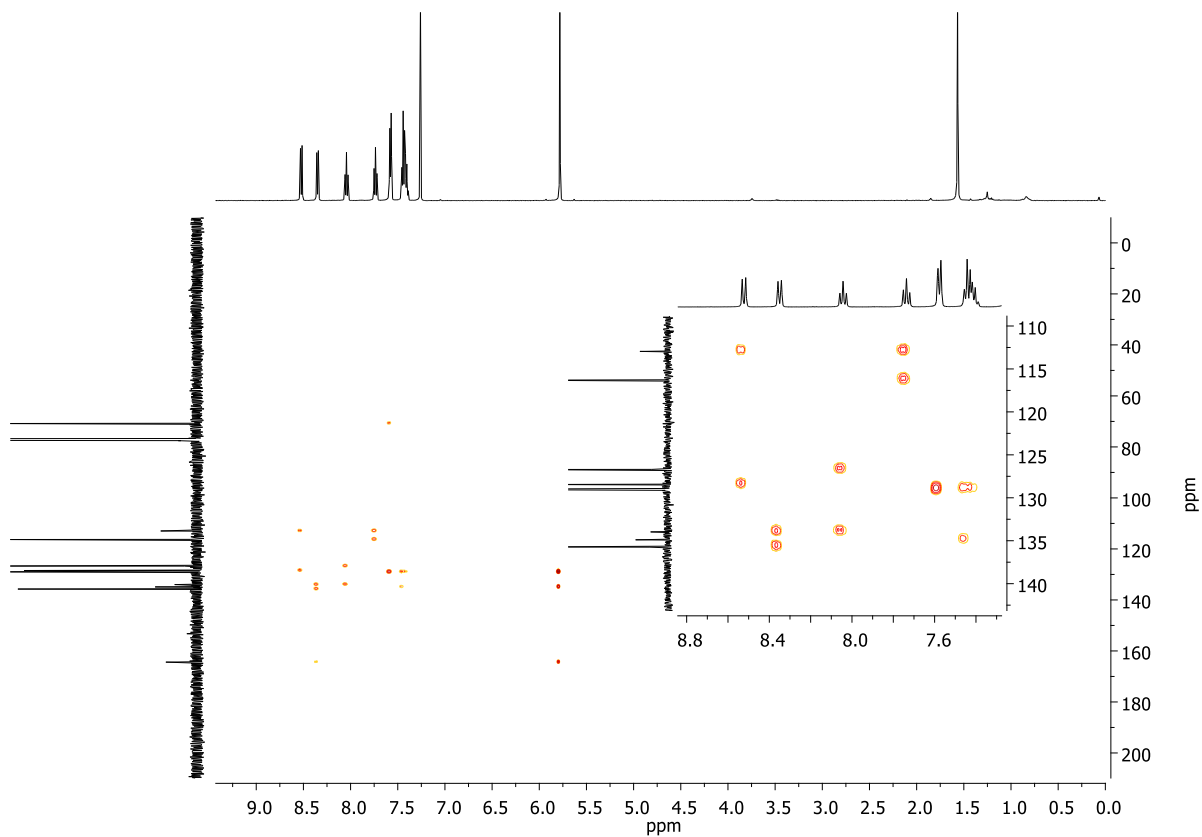




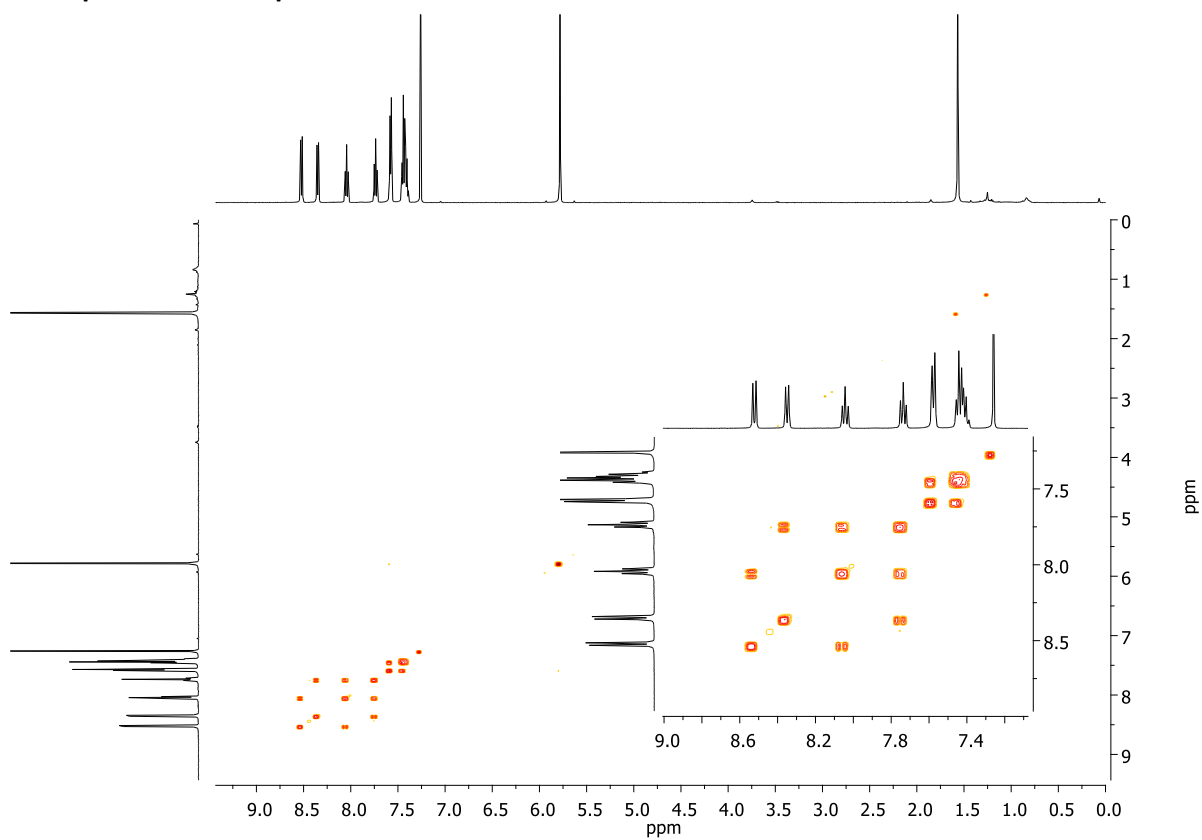
HSQC spectrum of compound 9a:



HMBC spectrum of compound 9a:



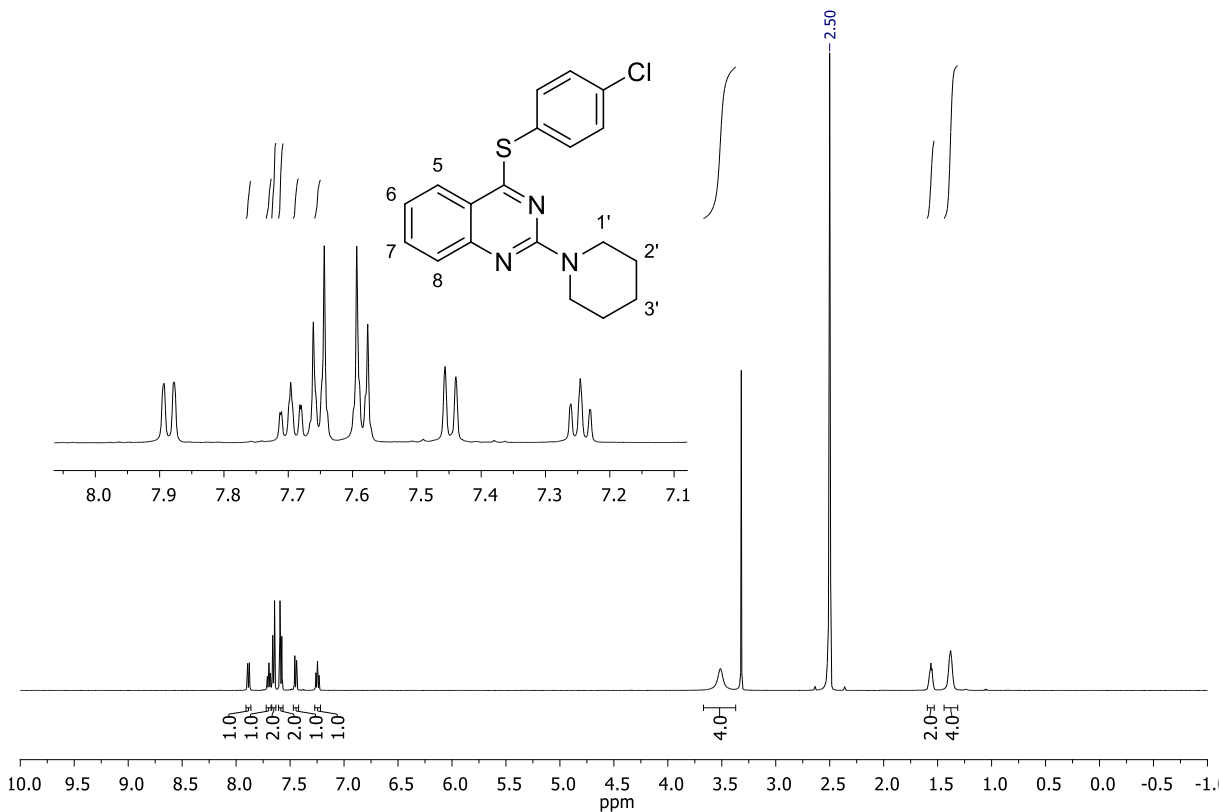
COSY spectrum of compound 9a:



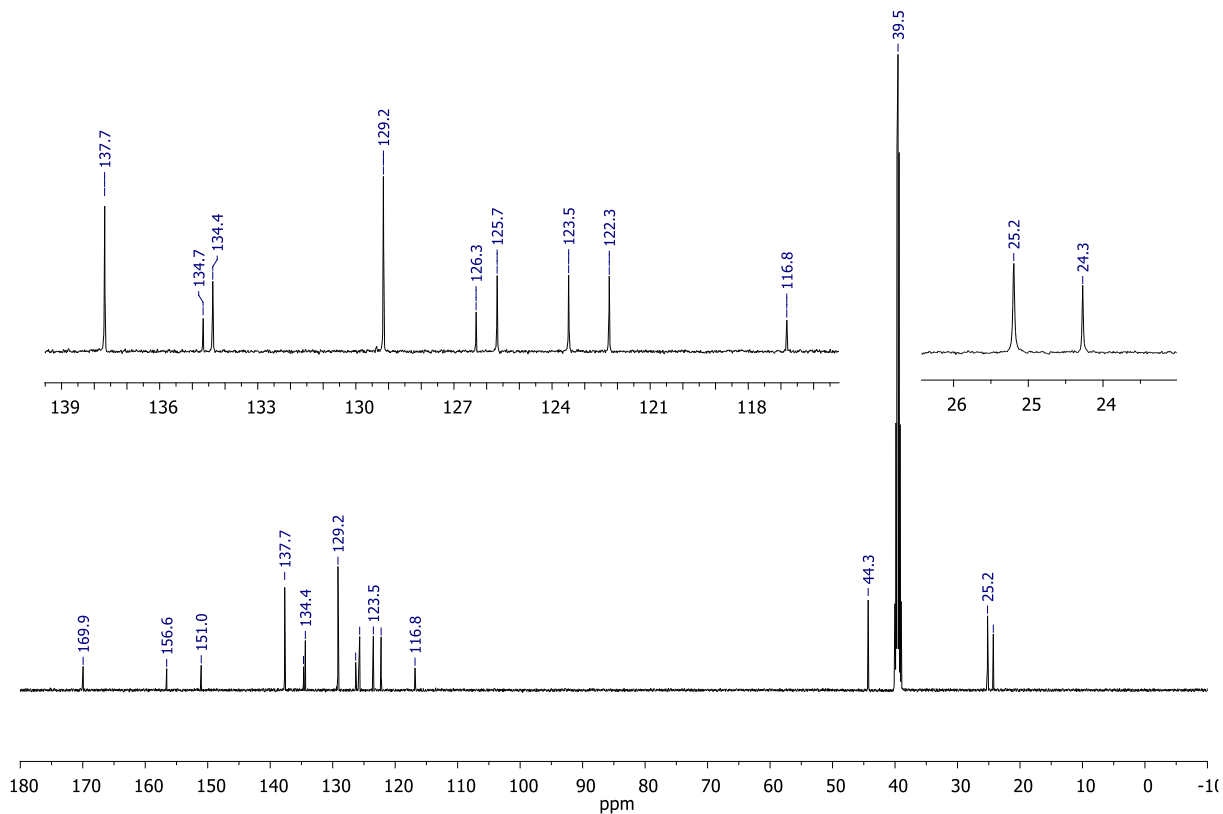
## 4-(Arylthio)-2-(piperidiny)quinazolines

### 4-[(4-Chlorophenyl)thio]-2-(piperidin-1-yl)quinazoline (5a)

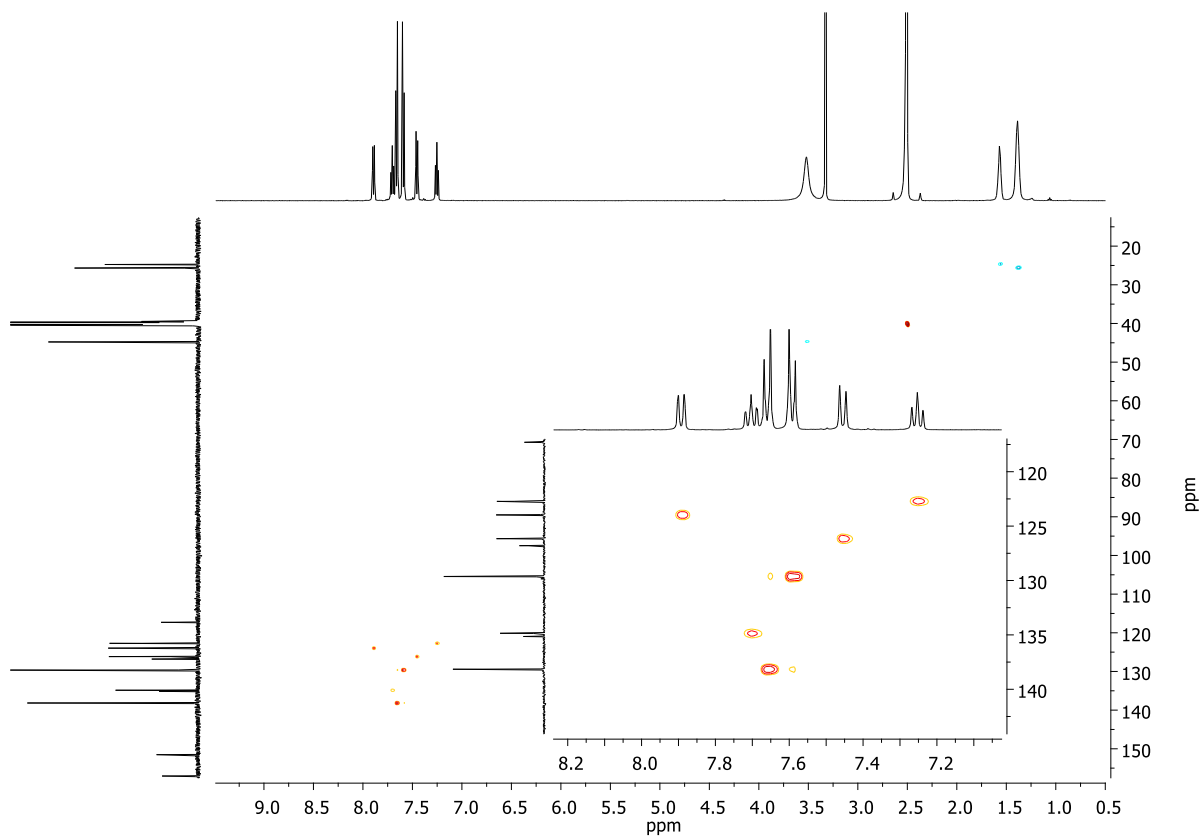
$^1\text{H-NMR}$  (500 MHz,  $\text{DMSO-d}_6$ ) spectrum of compound 5a:



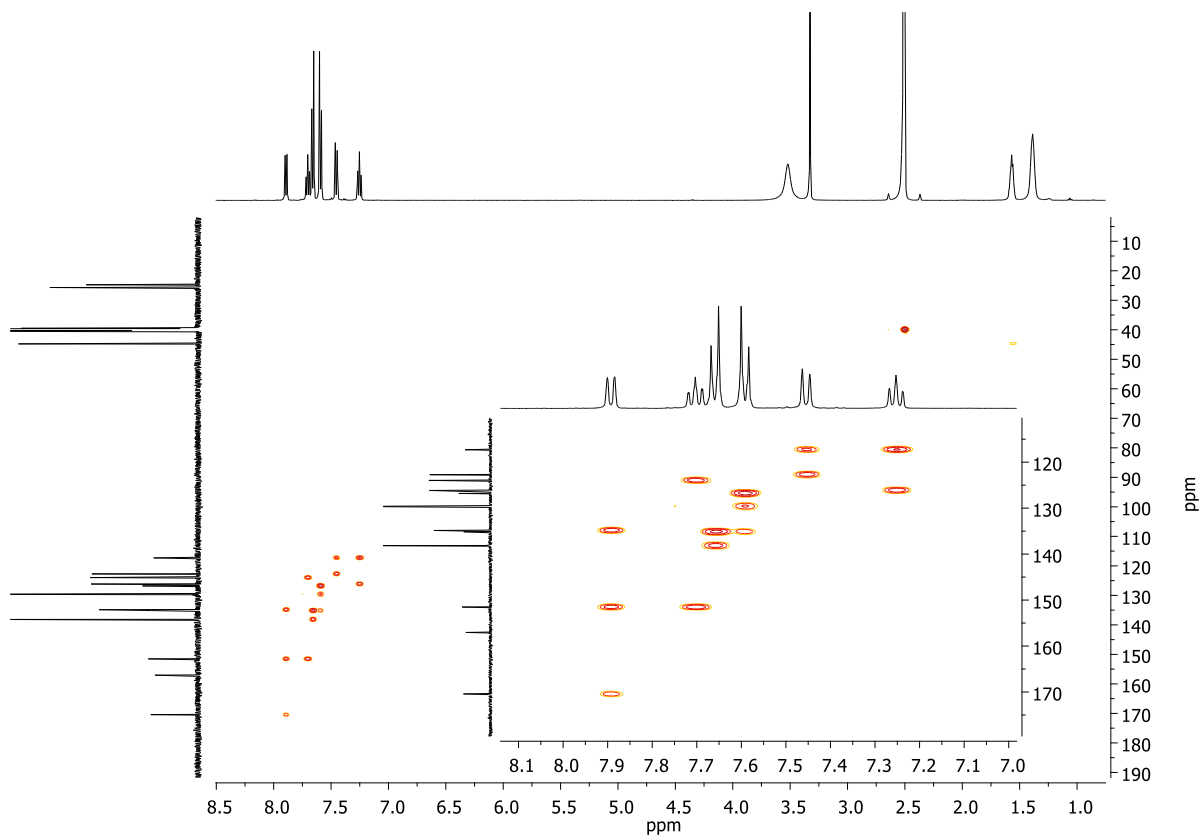
$^{13}\text{C-NMR}$  (125.7 MHz,  $\text{DMSO-d}_6$ ) spectrum of compound 5a:



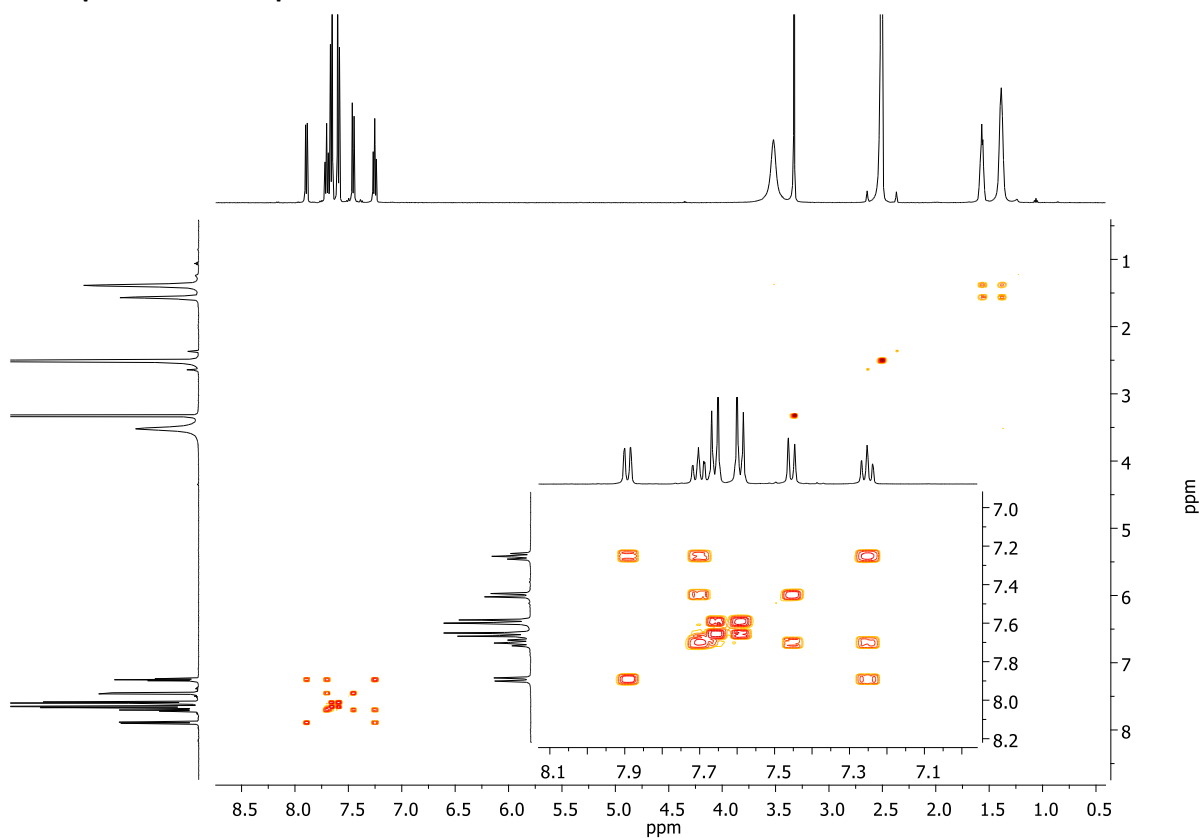
HSQC spectrum of compound 5a:



HMBC spectrum of compound 5a:

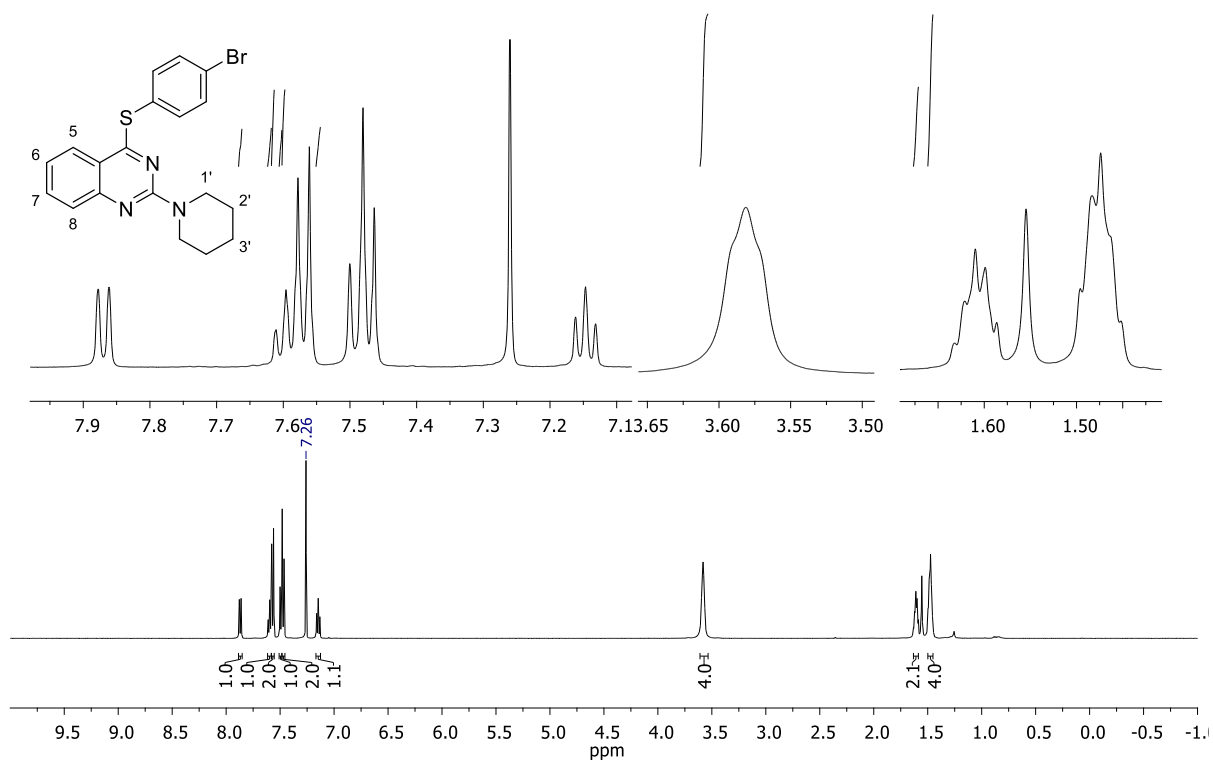


**COSY spectrum of compound 5a:**

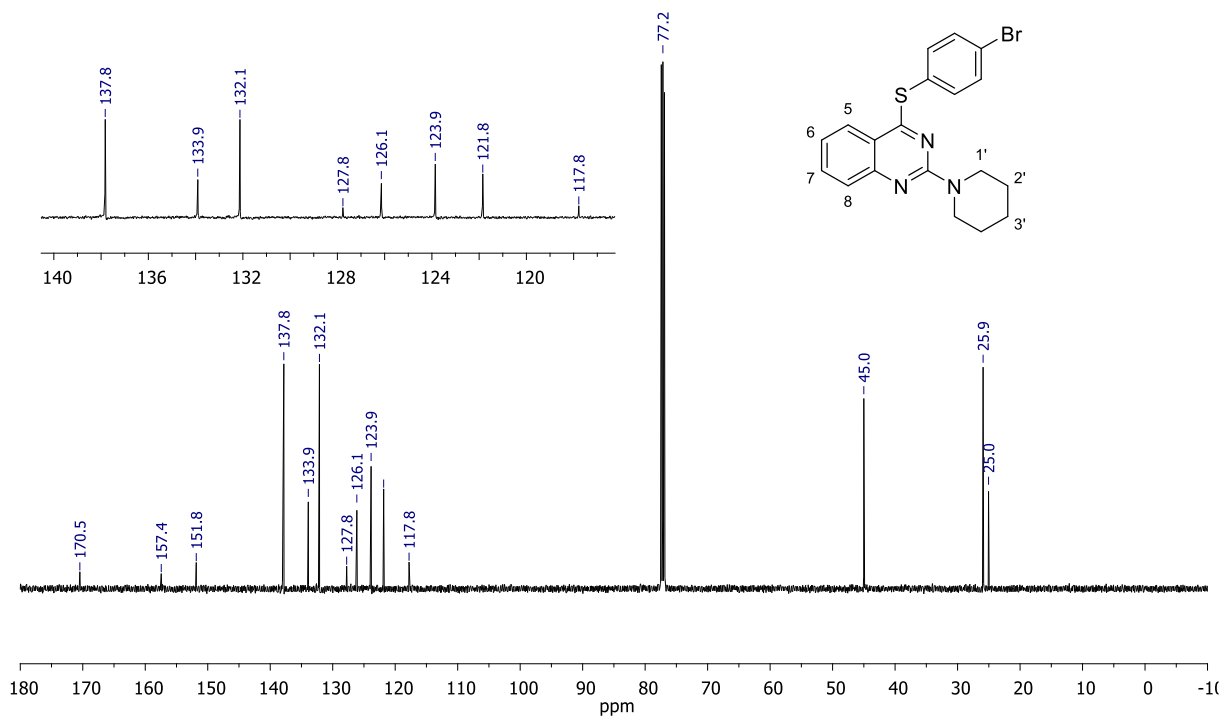


**4-[(4-Bromophenyl)thio]-2-(piperidin-1-yl)quinazoline (5b)**

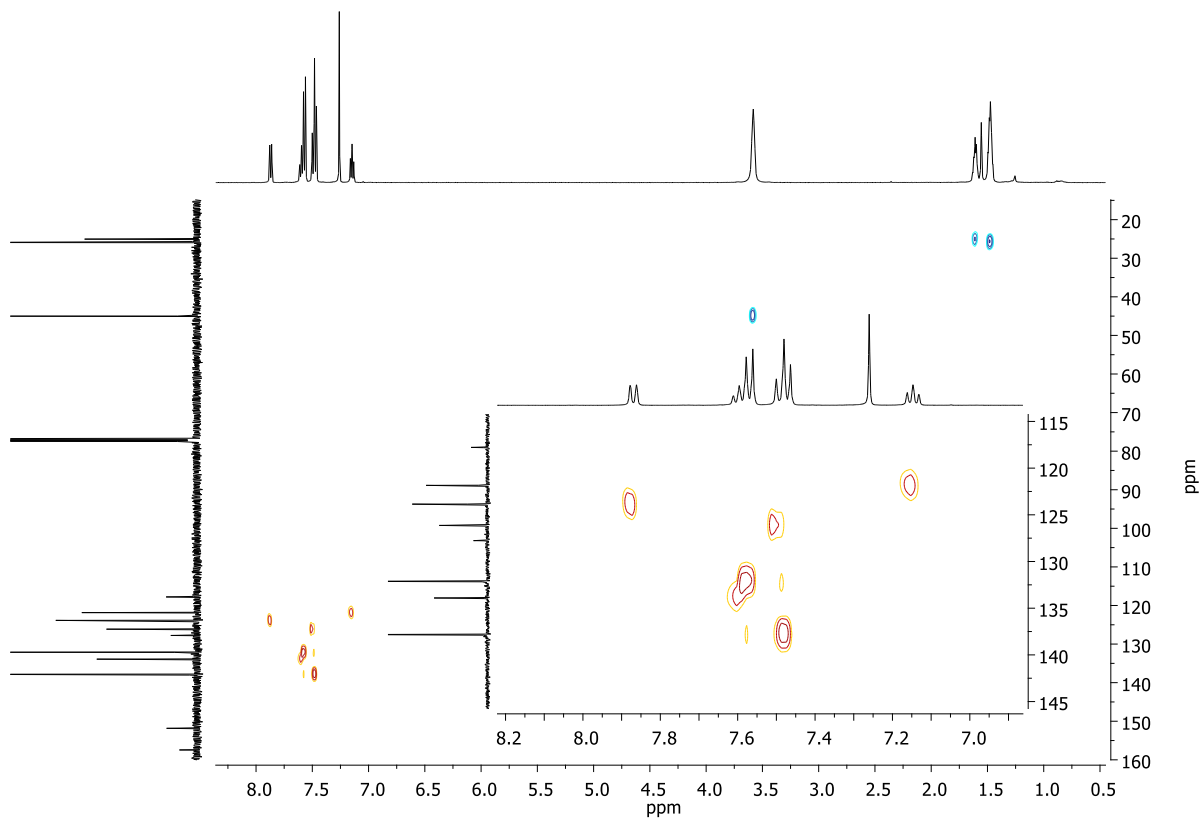
**<sup>1</sup>H-NMR (500 MHz, CDCl<sub>3</sub>) spectrum of compound 5b:**



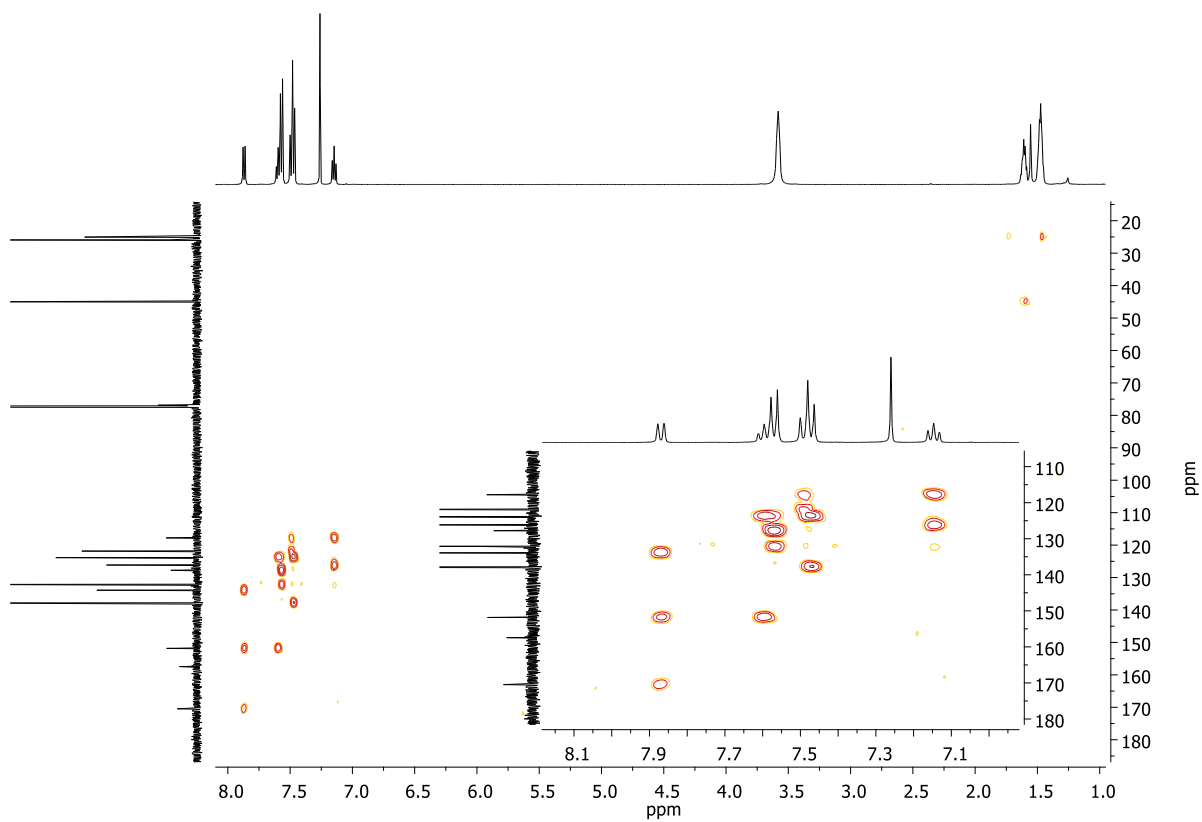
**$^{13}\text{C}$ -NMR (125.7 MHz,  $\text{CDCl}_3$ ) spectrum of compound 5b:**



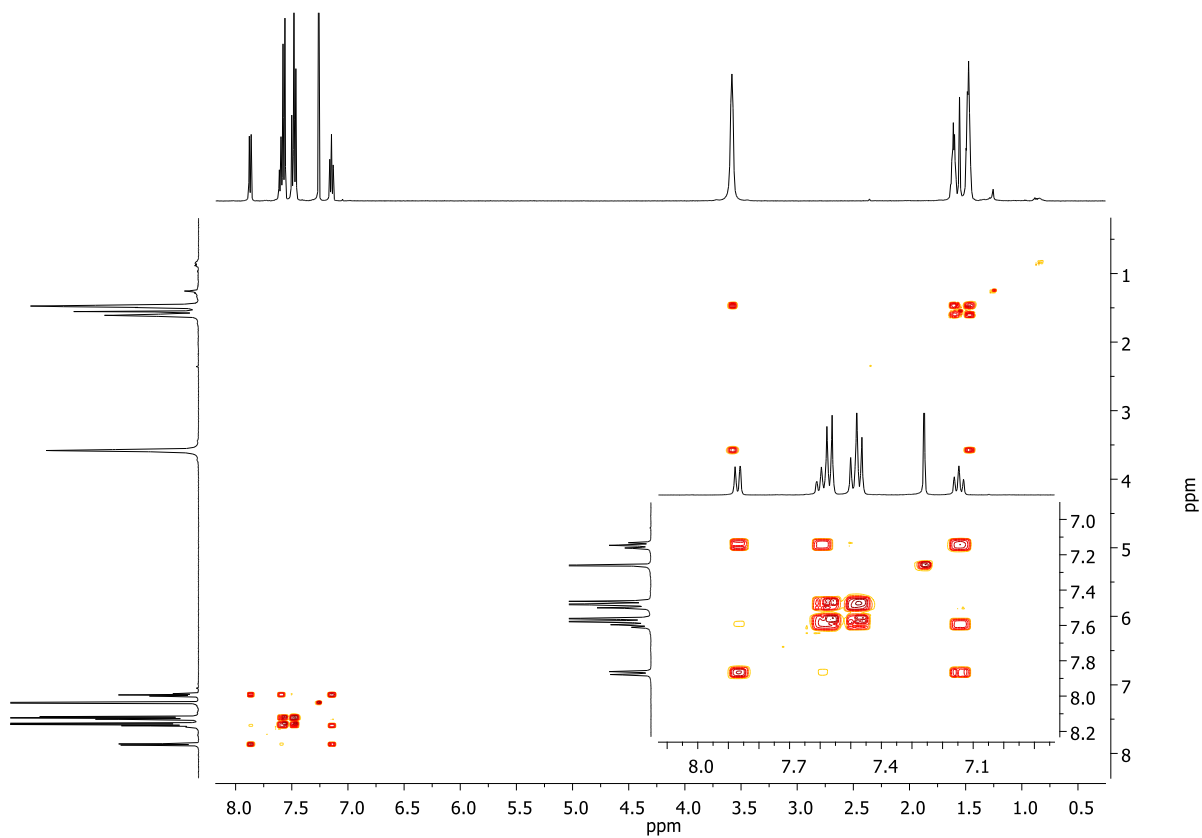
**HSQC spectrum of compound 5b:**



HMBC spectrum of compound 5b:



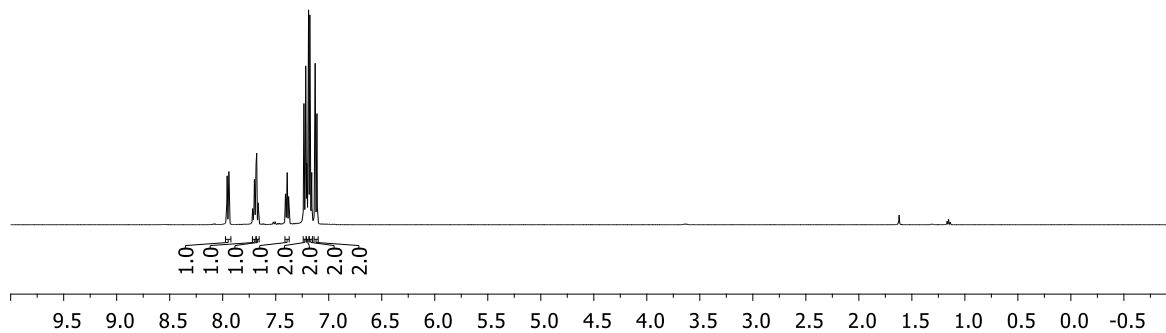
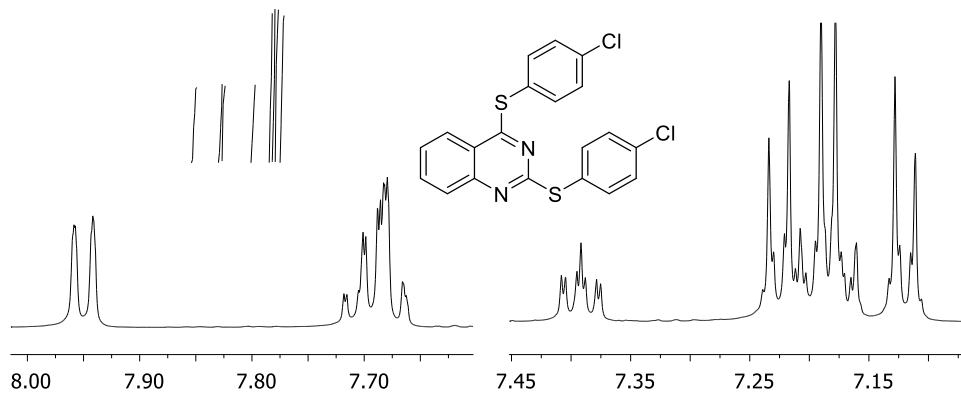
COSY spectrum of compound 5b:



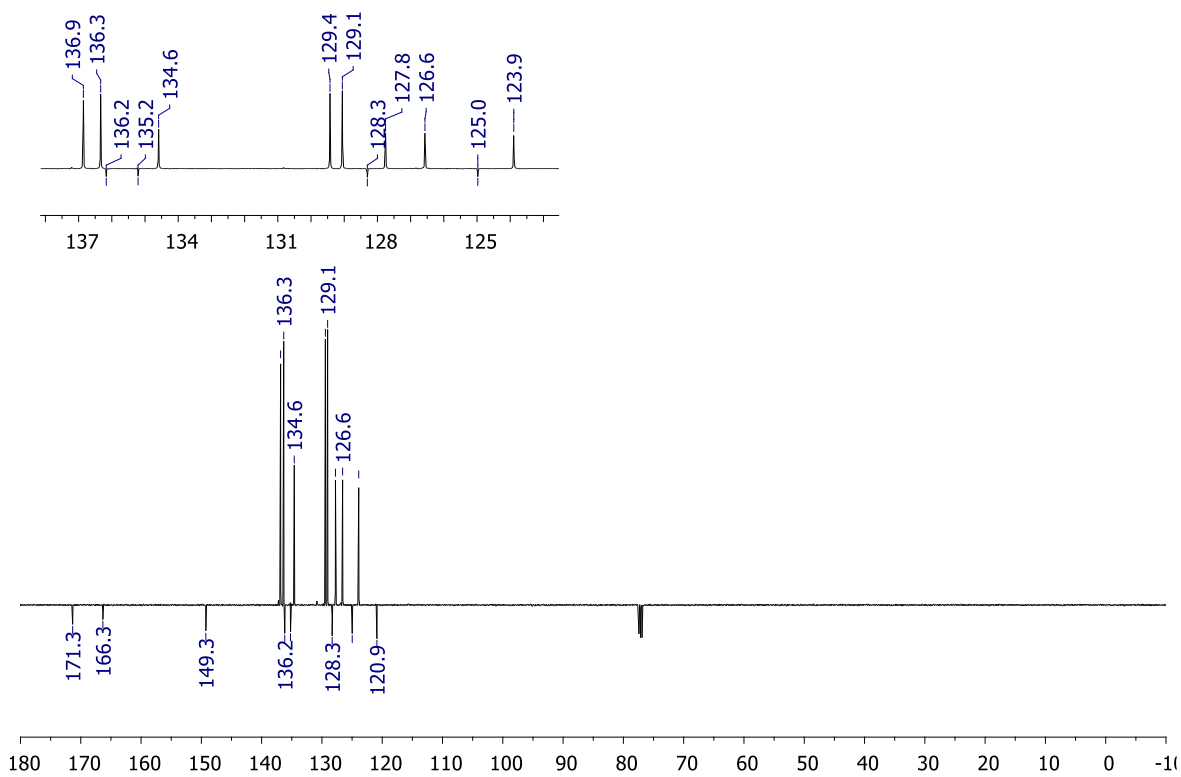
## 2,4-Bis-(arylthio)quinazolines

### 2,4-Bis-[(4-chlorophenyl)thio]quinazoline (12a)

$^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ) spectrum of compound 12a:



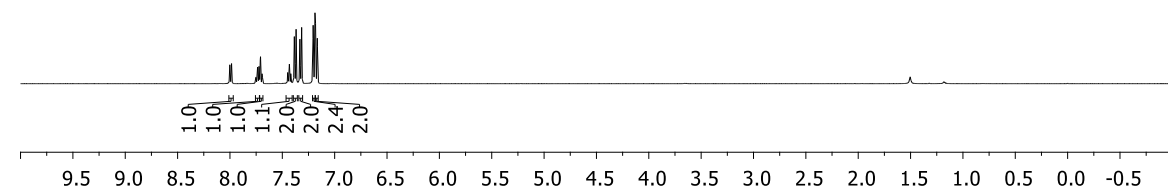
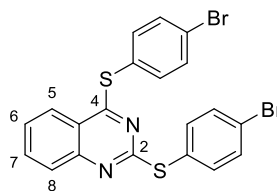
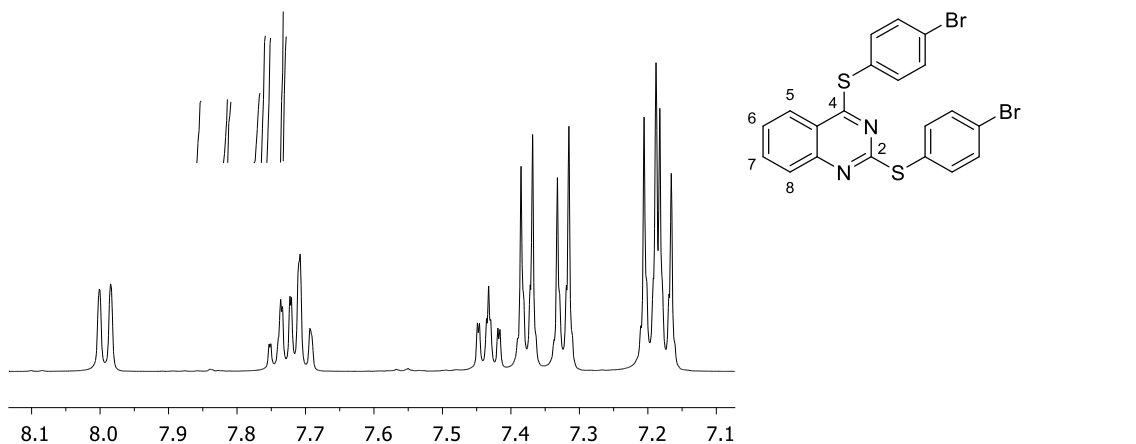
$^{13}\text{C}$ -NMR (125.7 MHz,  $\text{CDCl}_3$ ) spectrum of compound 12a:



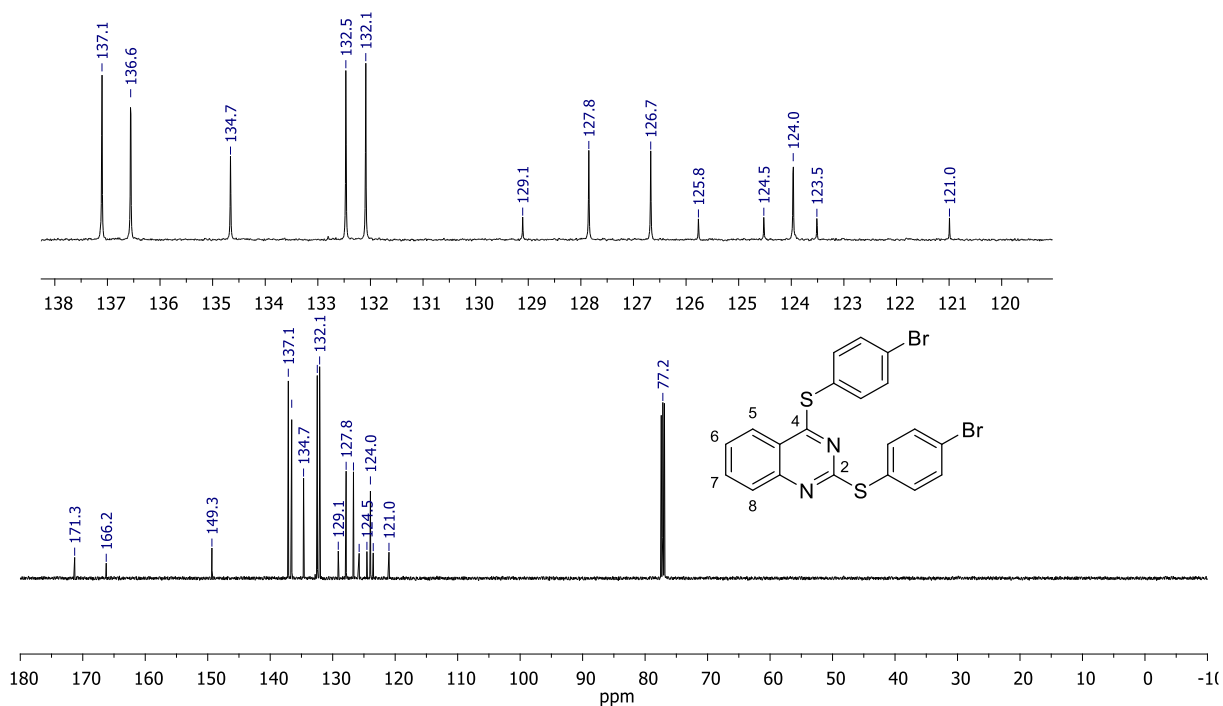


## 2,4-Bis-[(4-bromophenyl)thio]quinazoline (12b)

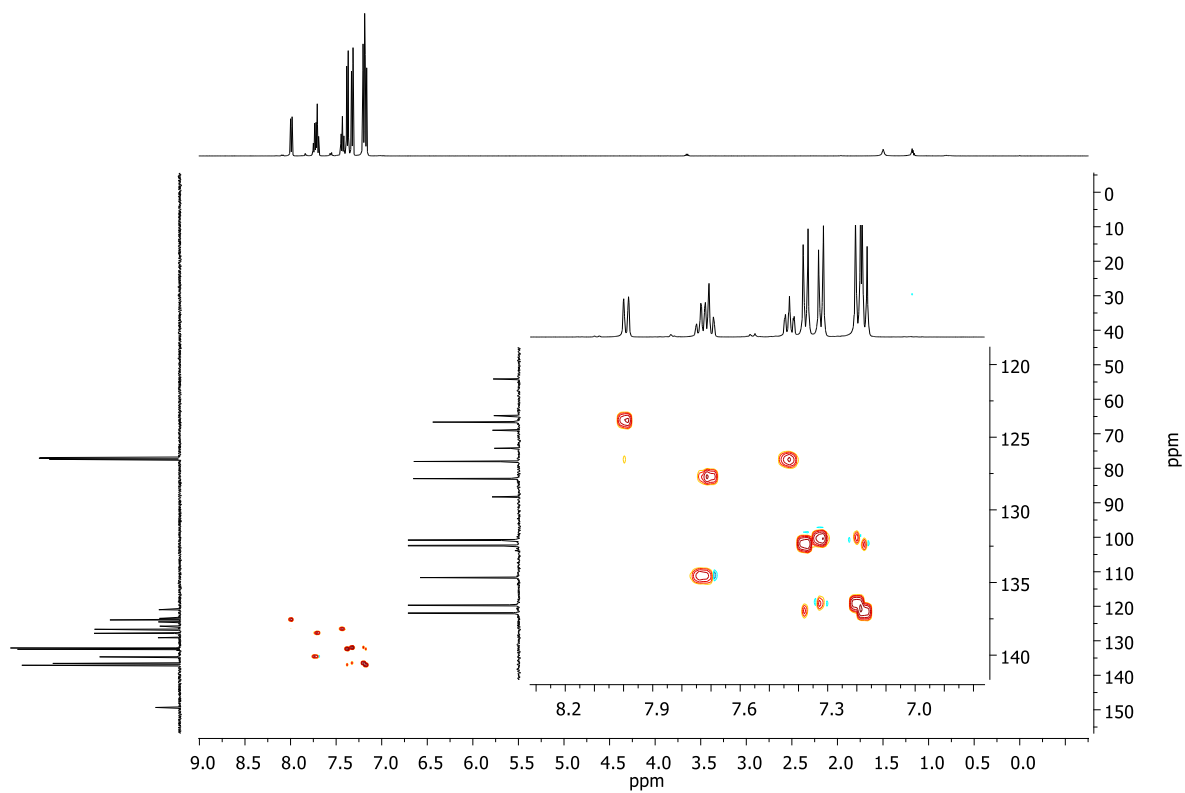
$^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ) spectrum of compound 12b:



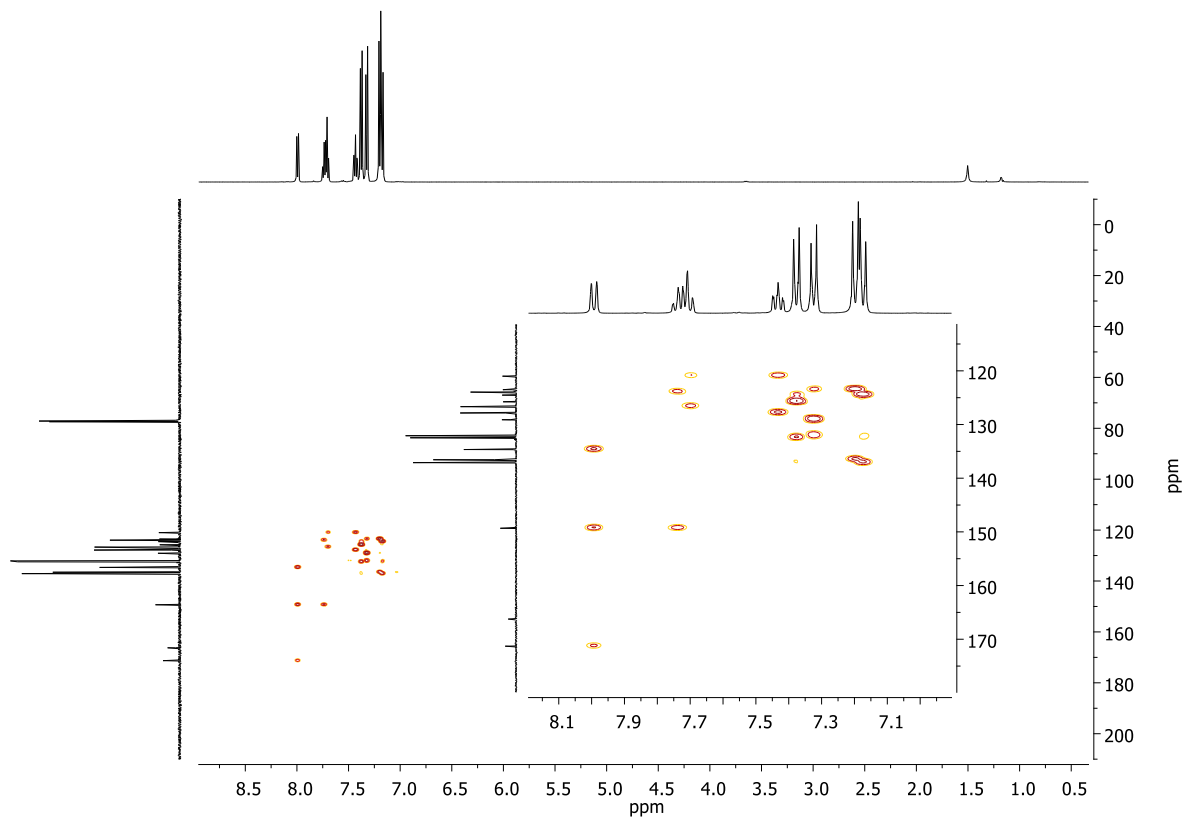
$^{13}\text{C}$ -NMR (125.7 MHz,  $\text{CDCl}_3$ ) spectrum of compound 12b:



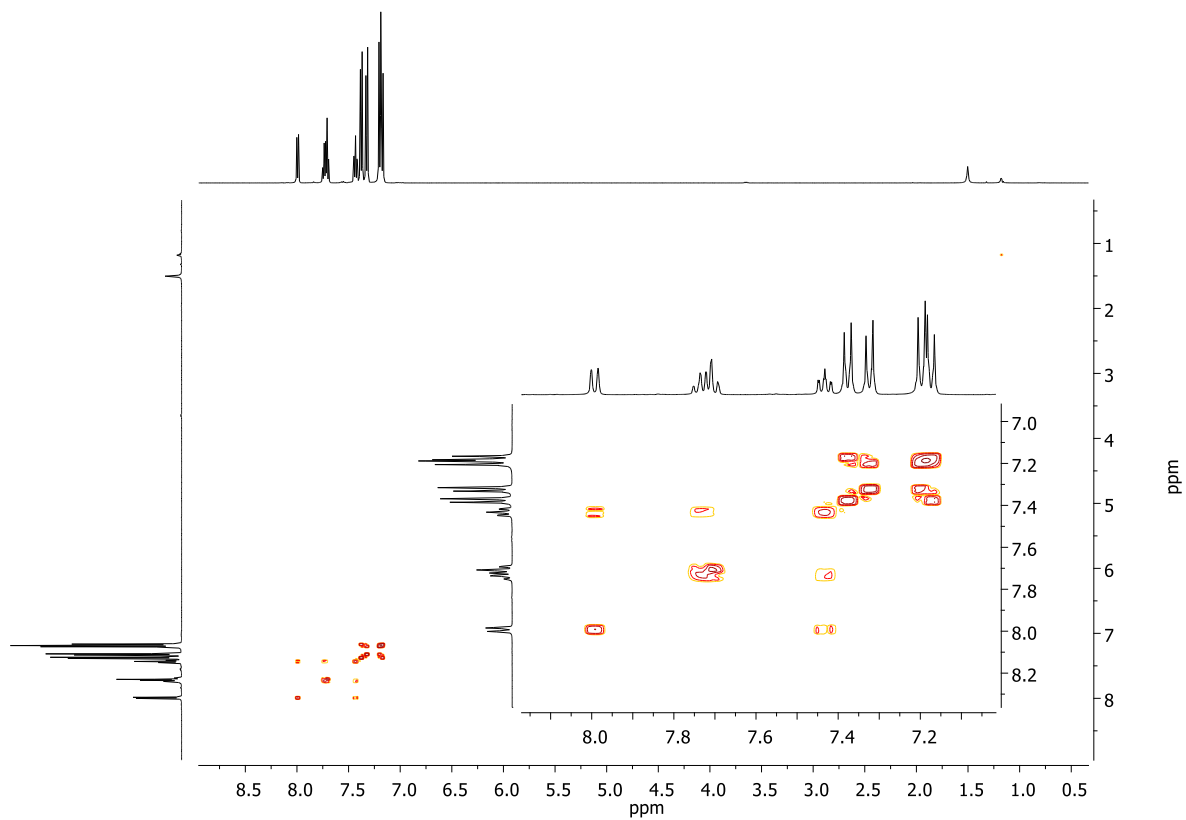
HSQC spectrum of compound 12b:



HMBC spectrum of compound 12b:



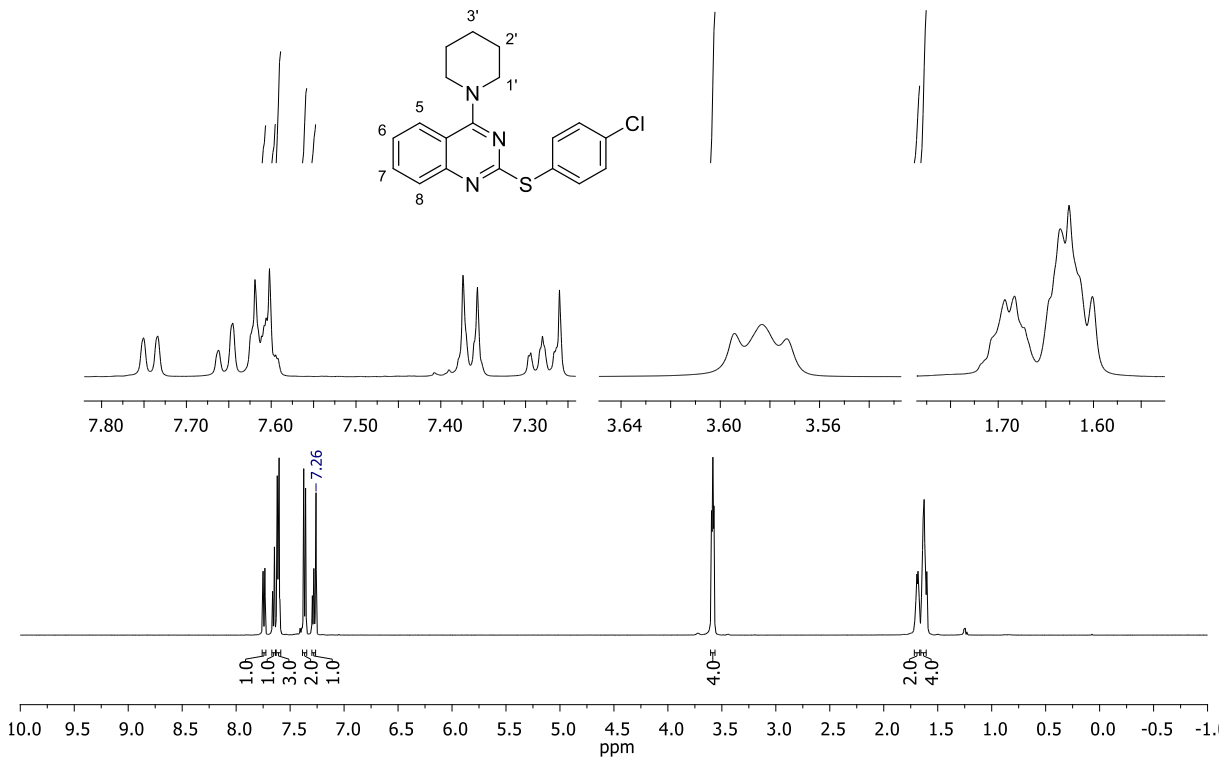
COSY spectrum of compound 12b:



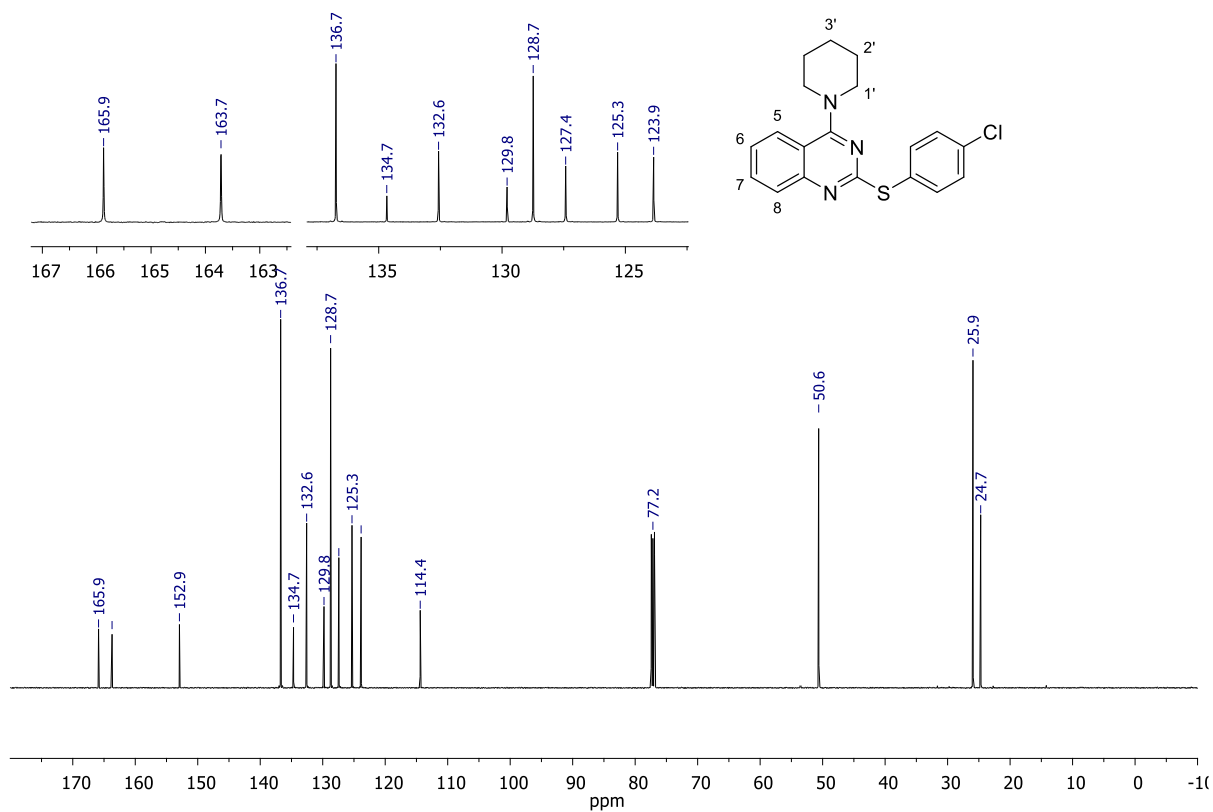
## 2-(Arylthio)-4-(piperidiny)quinazolines

### 2-[(4-Chlorophenyl)thio]-4-(piperidin-1-yl)quinazoline (13a)

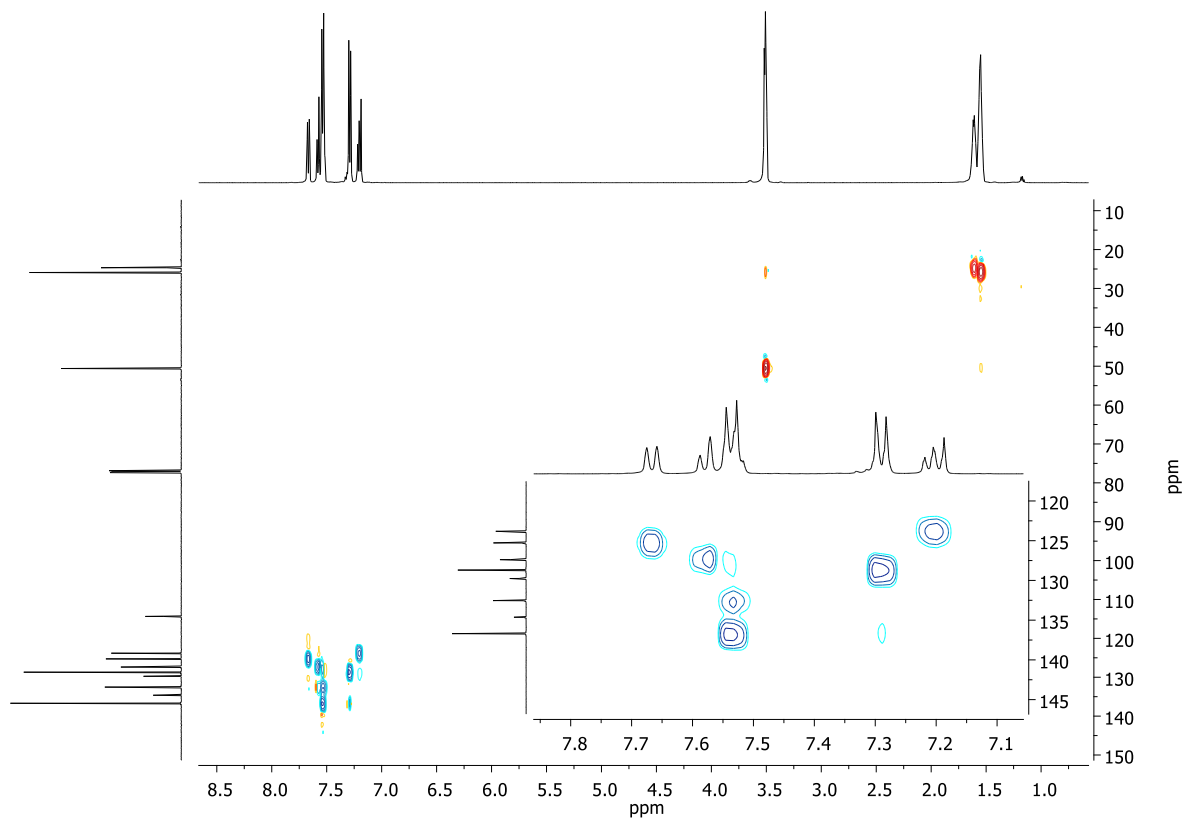
<sup>1</sup>H-NMR (500 MHz, CDCl<sub>3</sub>) spectrum of compound 13a:



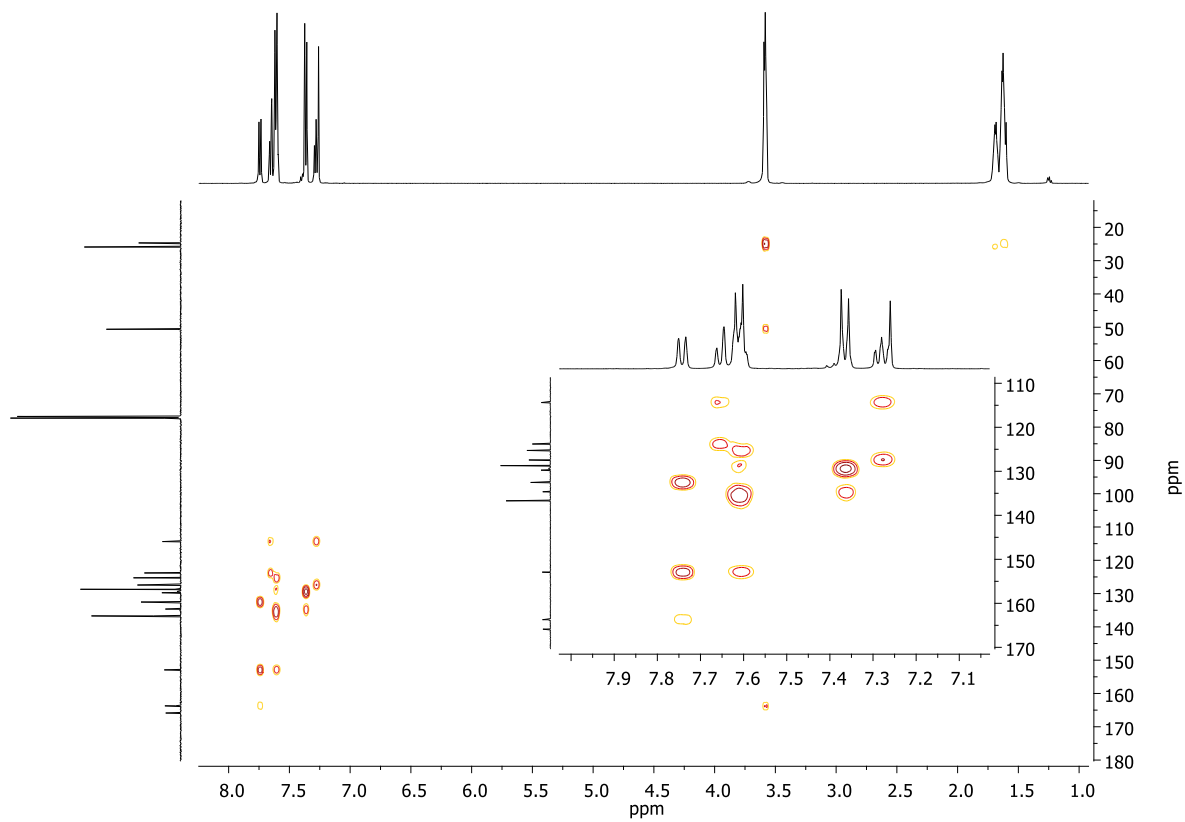
<sup>13</sup>C-NMR (125.7 MHz, CDCl<sub>3</sub>) spectrum of compound 13a:



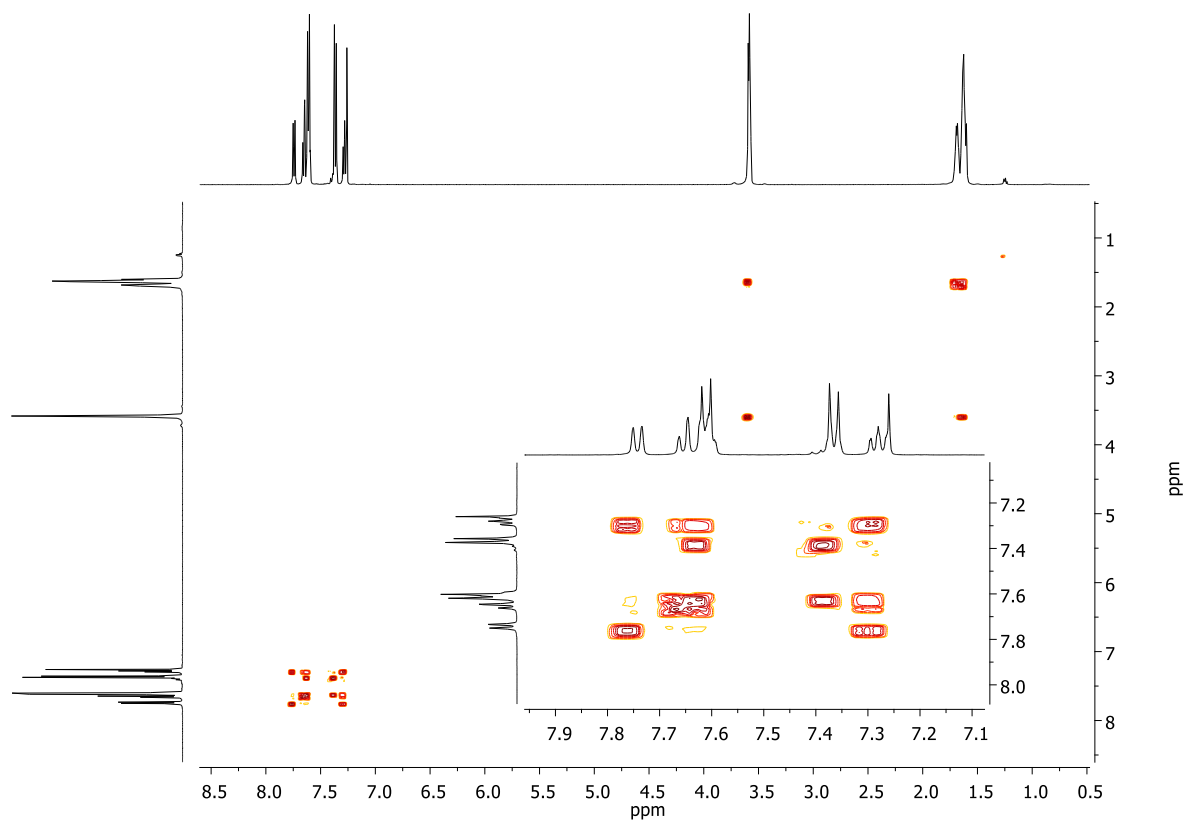
HSQC spectrum of compound 13a:



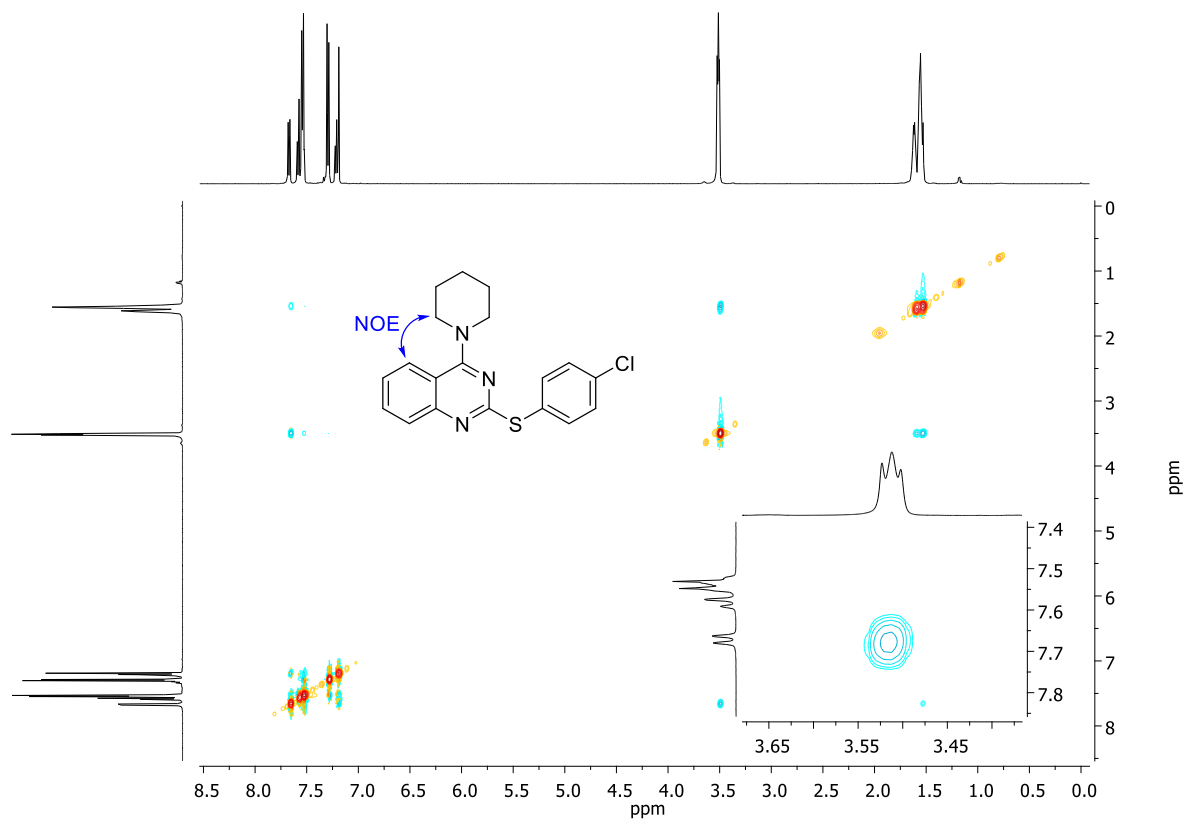
HMBC spectrum of compound 13a:



COSY spectrum of compound 13a:

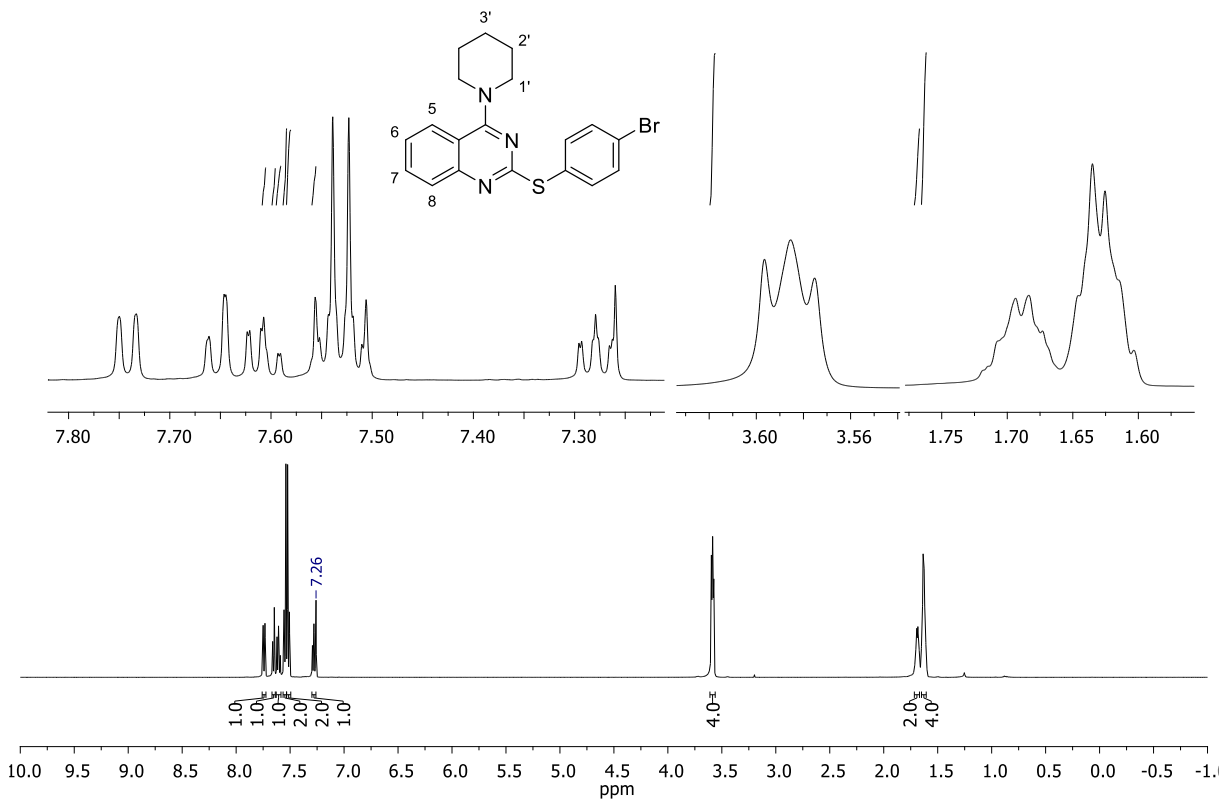


NOESY spectrum of compound 13a:

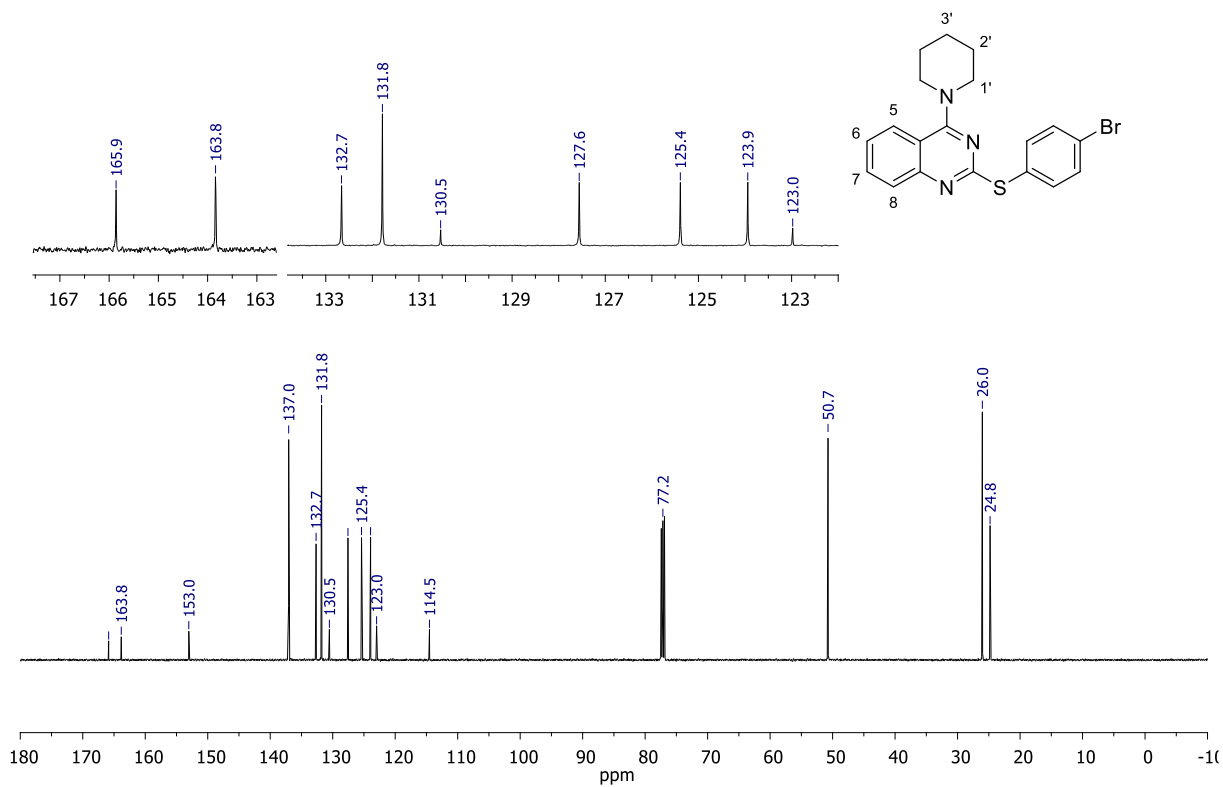


## 2-[(4-Bromophenyl)thio]-4-(piperidin-1-yl)quinazoline (13b)

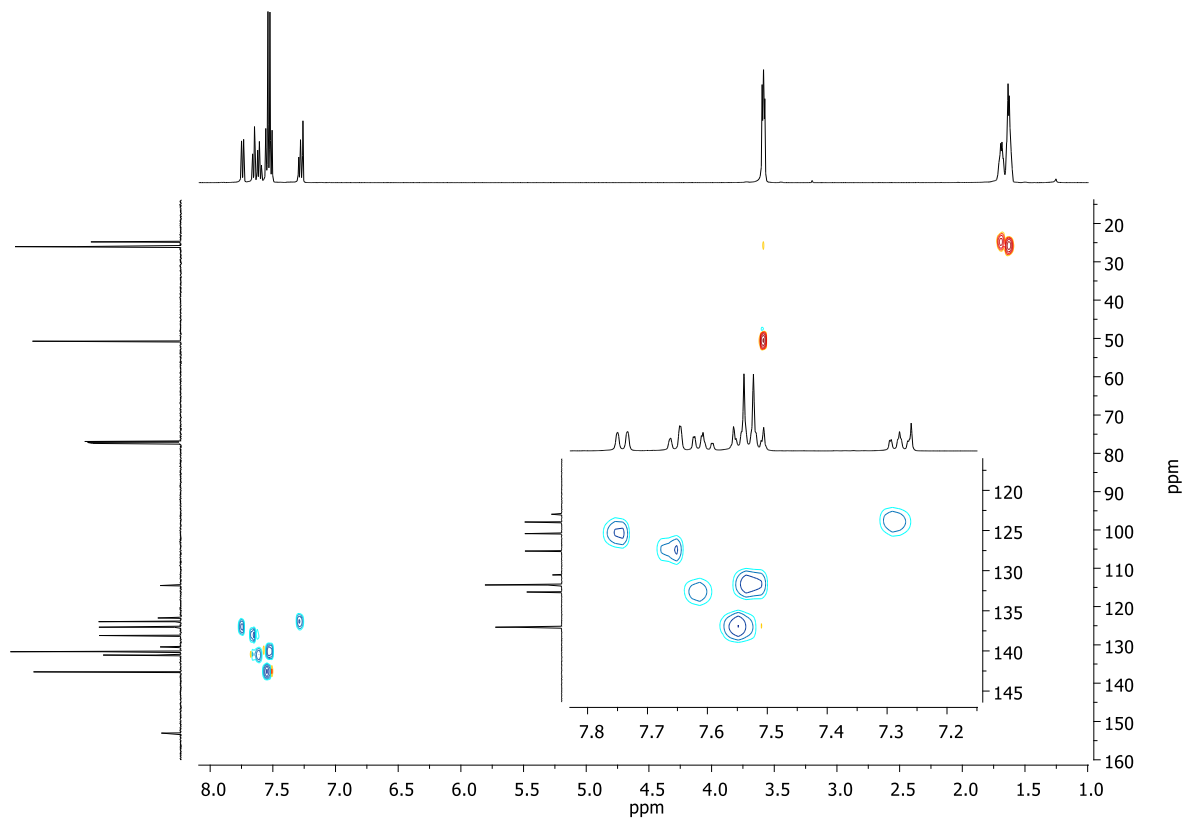
<sup>1</sup>H-NMR (500 MHz, CDCl<sub>3</sub>) spectrum of compound 13b:



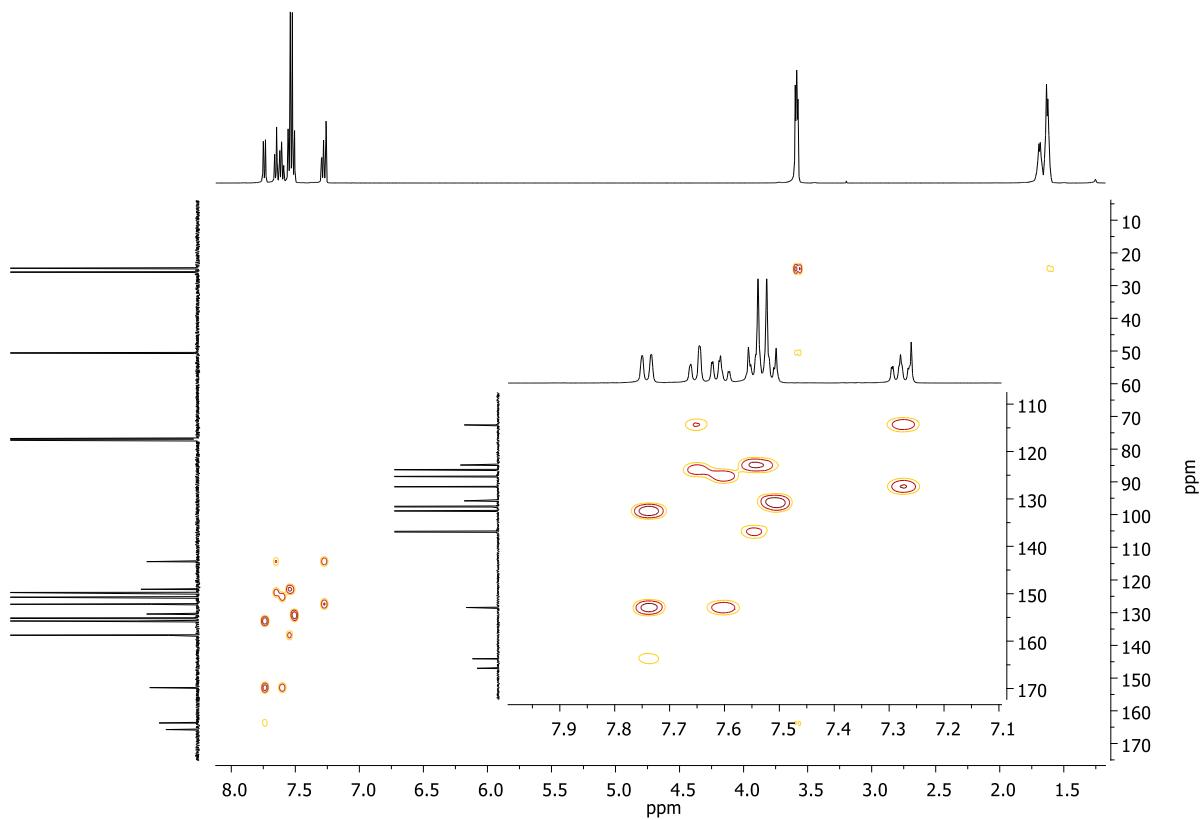
<sup>13</sup>C-NMR (125.7 MHz, CDCl<sub>3</sub>) spectrum of compound 13b:



HSQC spectrum of compound 13b:

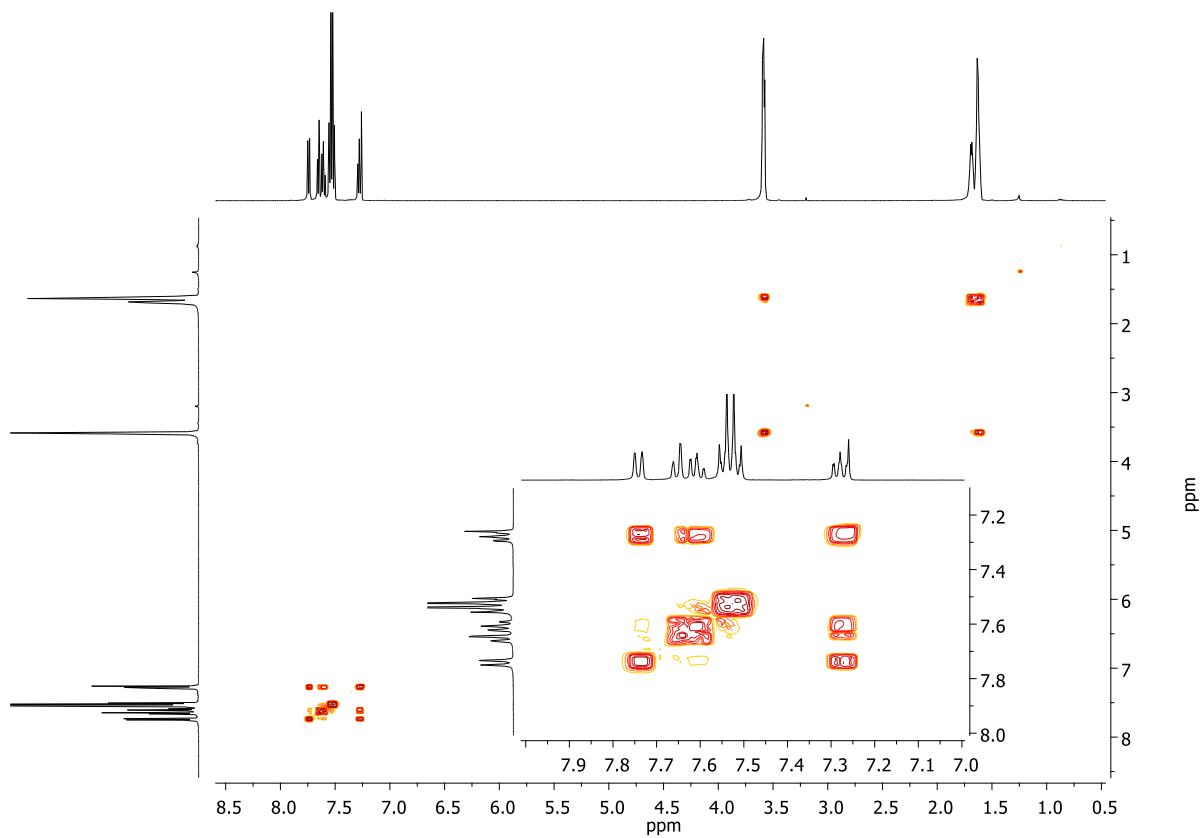


HMBC spectrum of compound 13b:

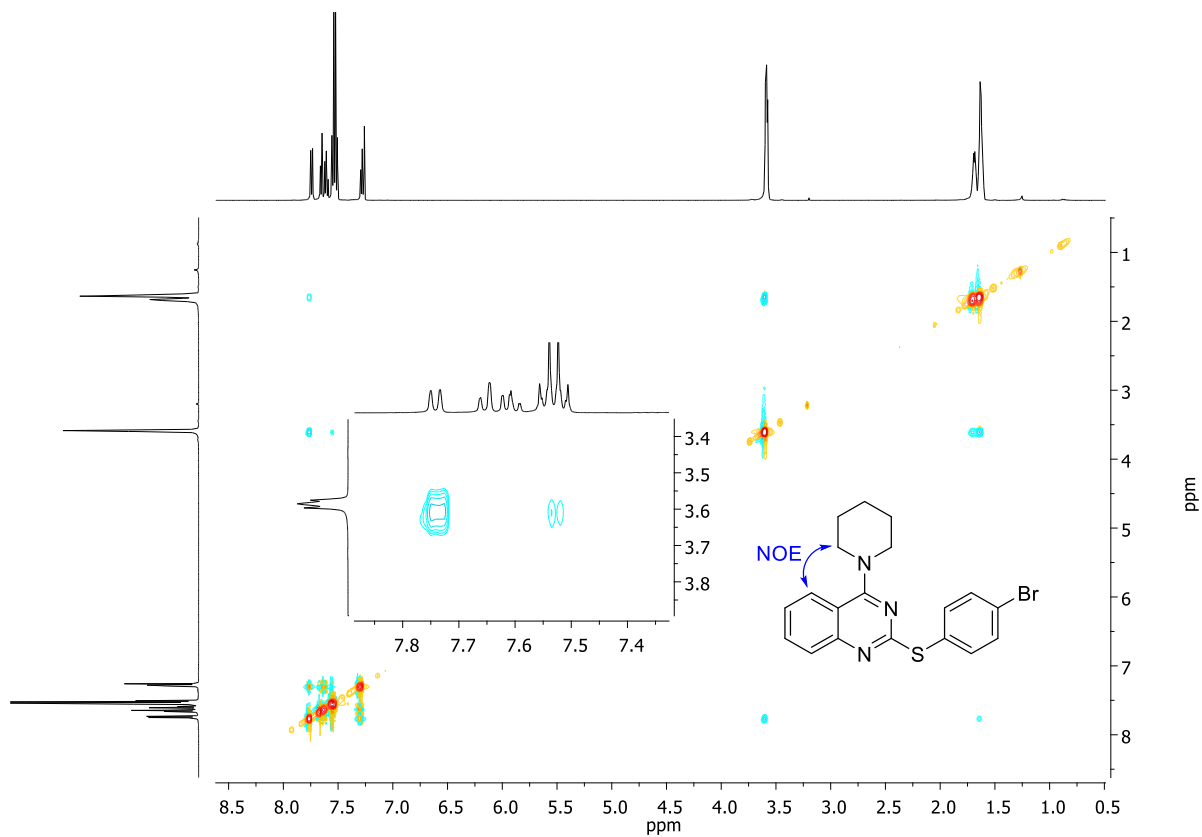




COSY spectrum of compound 13b:



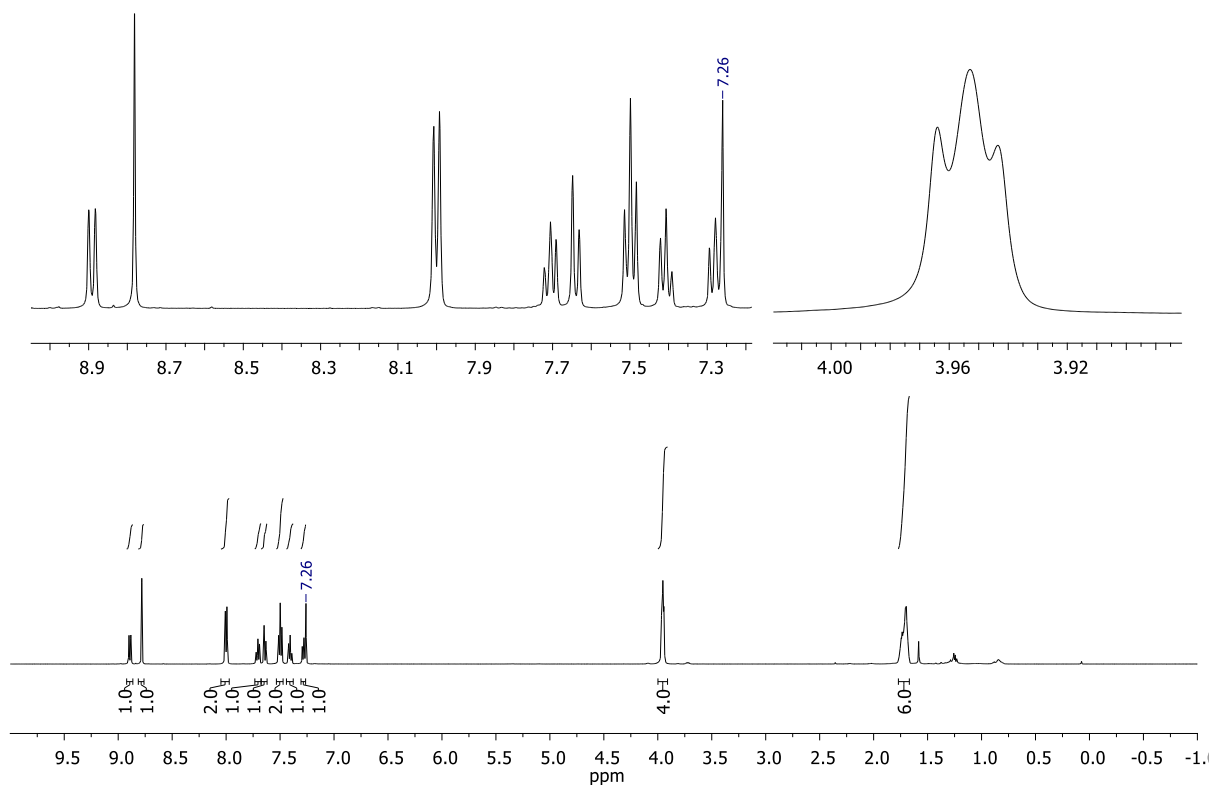
NOESY spectrum of compound 13b:



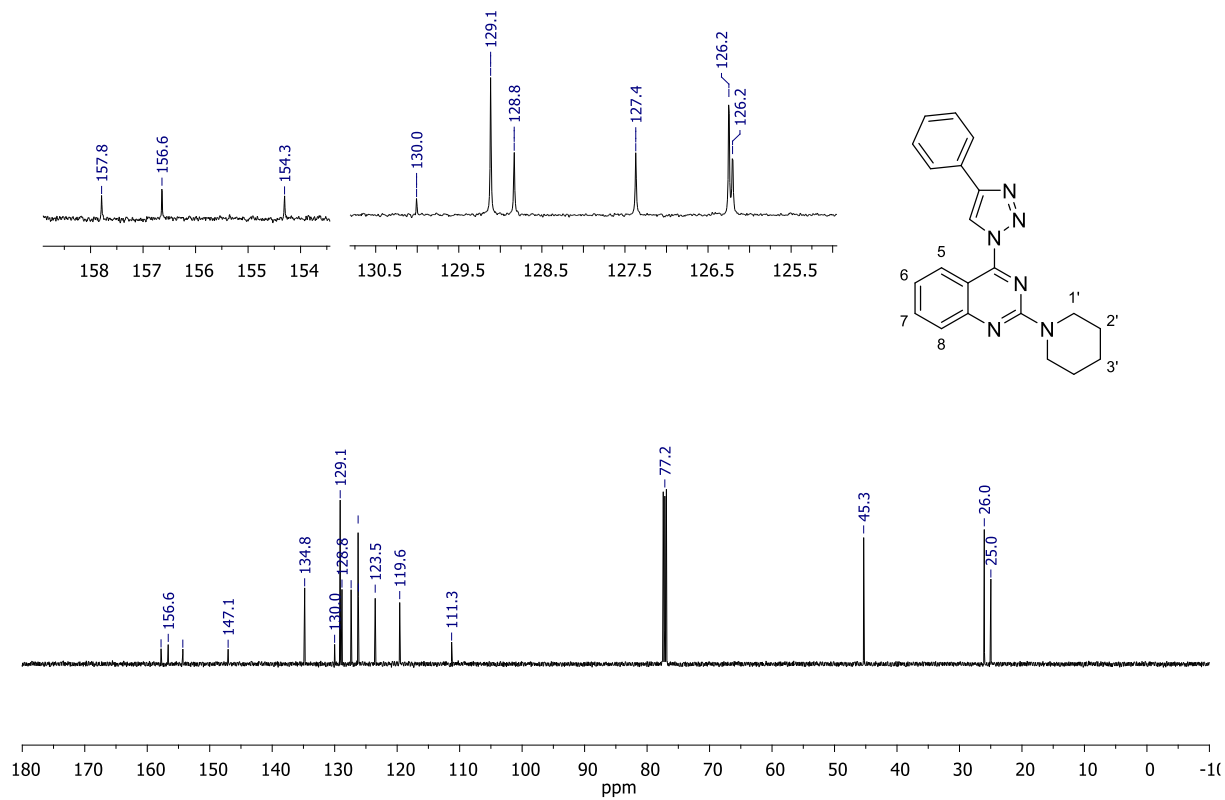
## 2-Amino-4-(1*H*-1,2,3-triazol-1-yl)quinazolines

### 4-(4-Phenyl-1*H*-1,2,3-triazol-1-yl)-2-(piperidin-1-yl)quinazoline (14a)

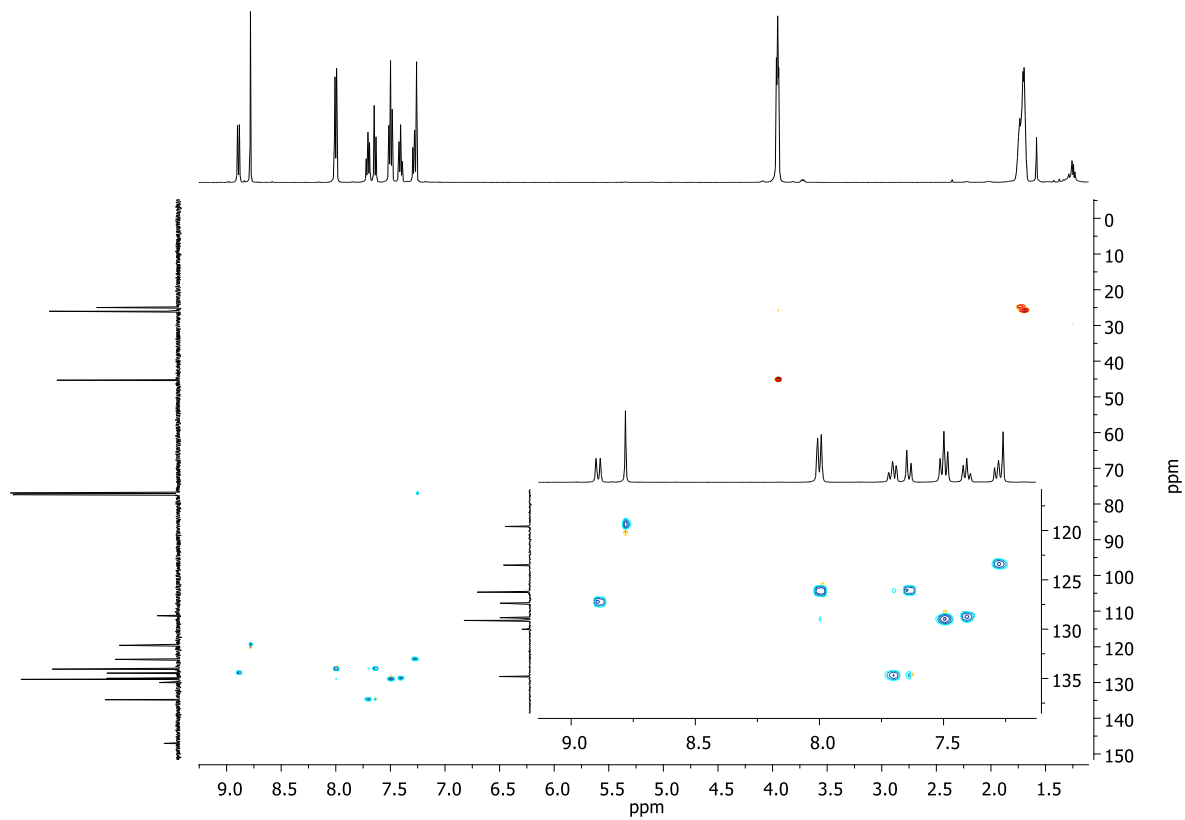
<sup>1</sup>H-NMR (500 MHz, CDCl<sub>3</sub>) spectrum of compound 14a:



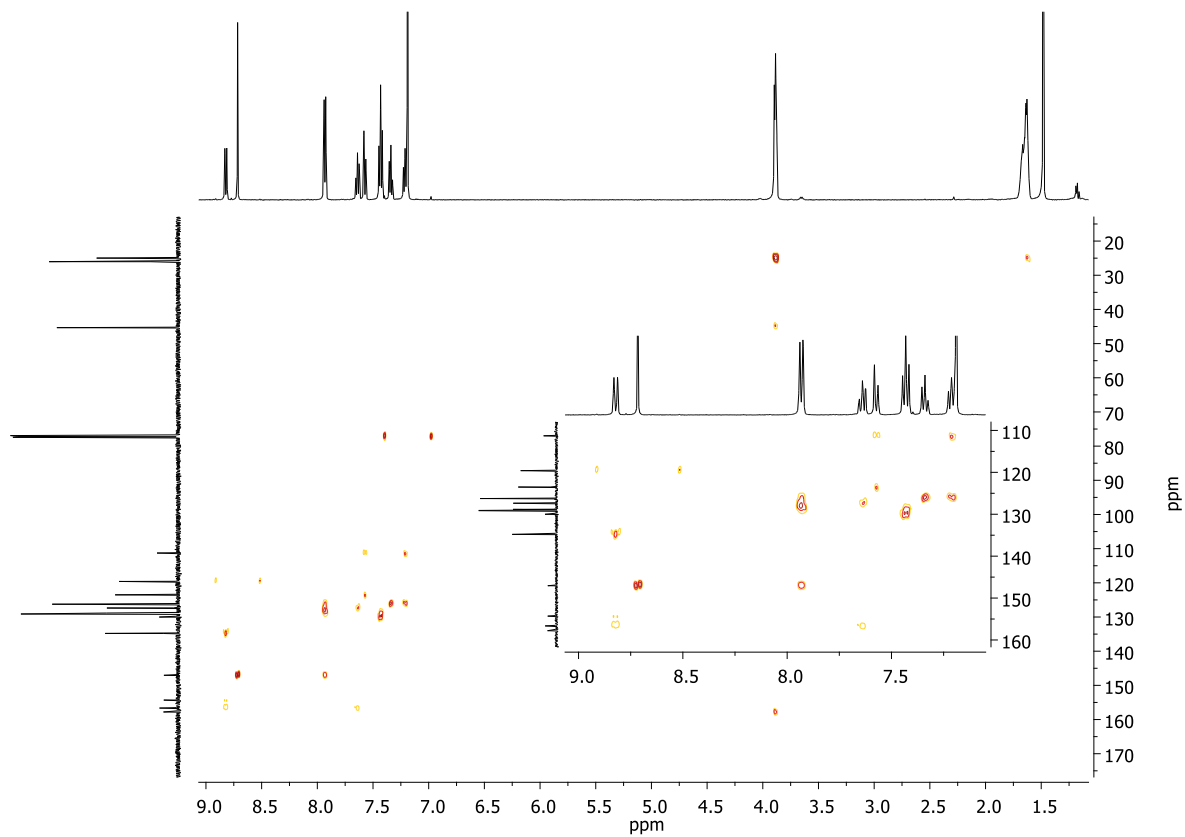
<sup>13</sup>C-NMR (125.7 MHz, CDCl<sub>3</sub>) spectrum of compound 14a:



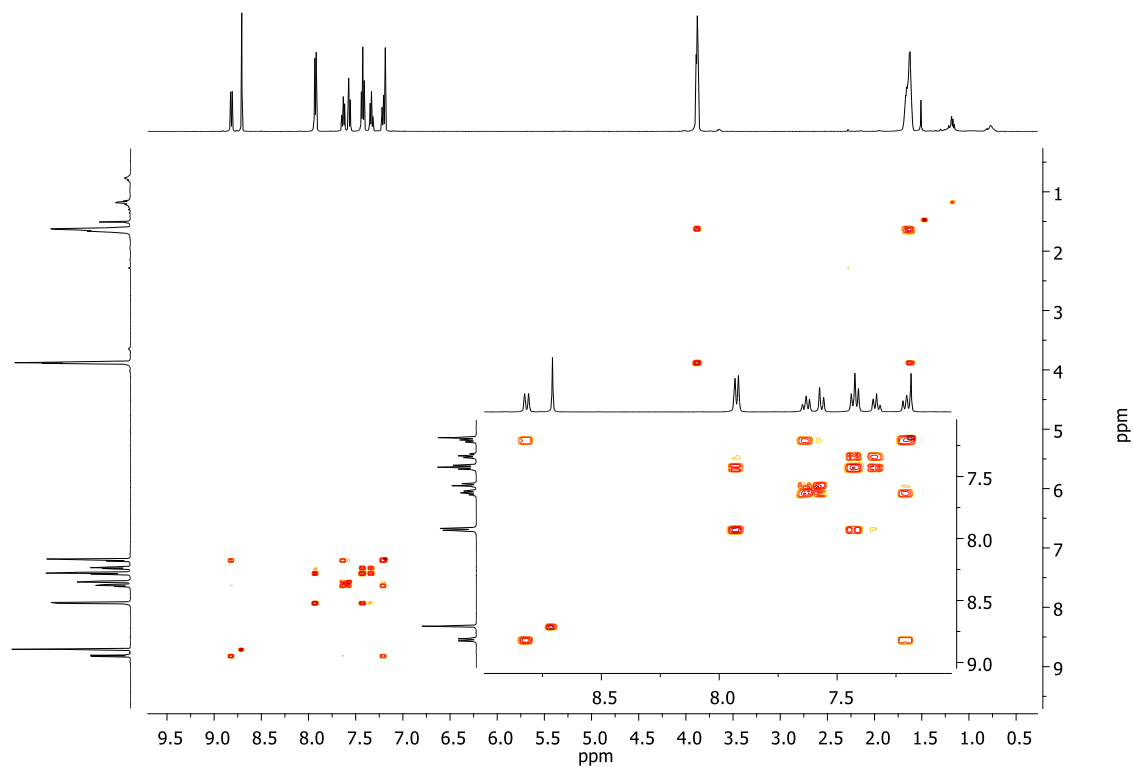
HSQC spectrum of compound 14a:



HMBC spectrum of compound 14a:

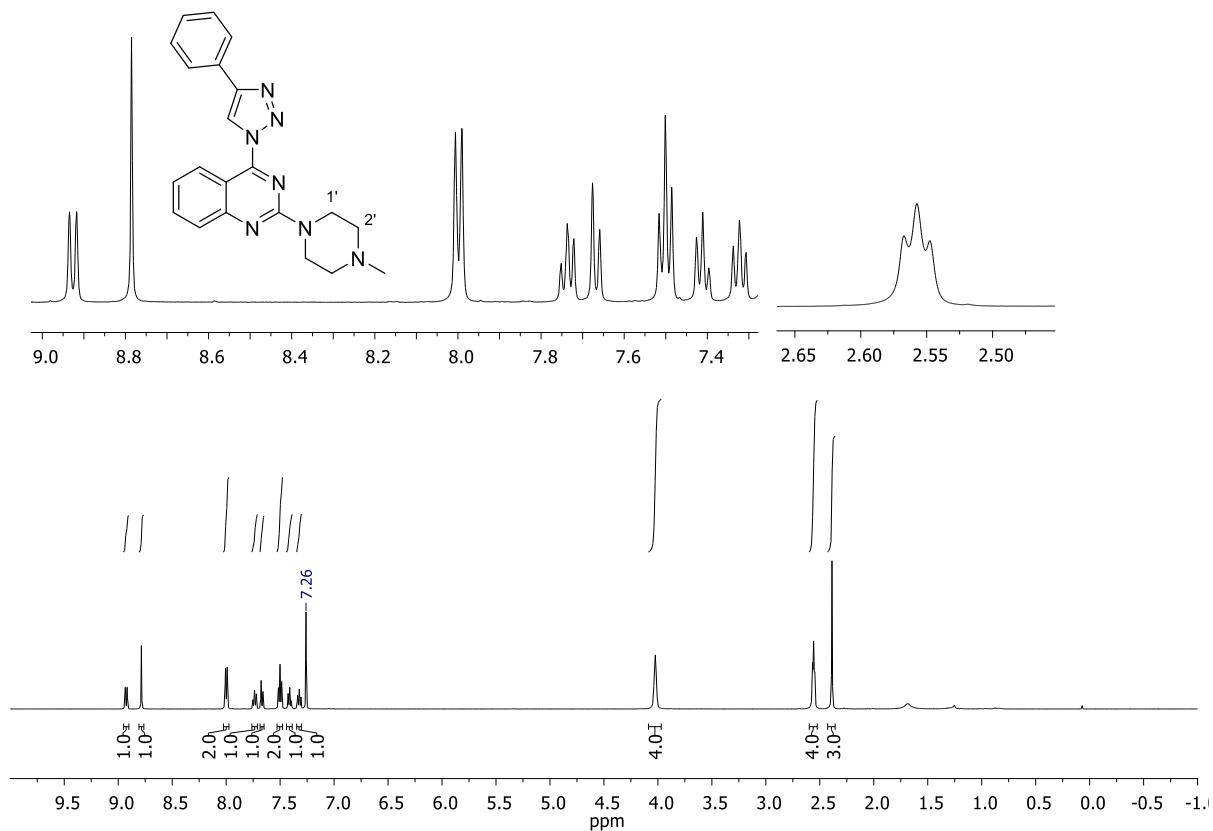


**COSY spectrum of compound 14a:**

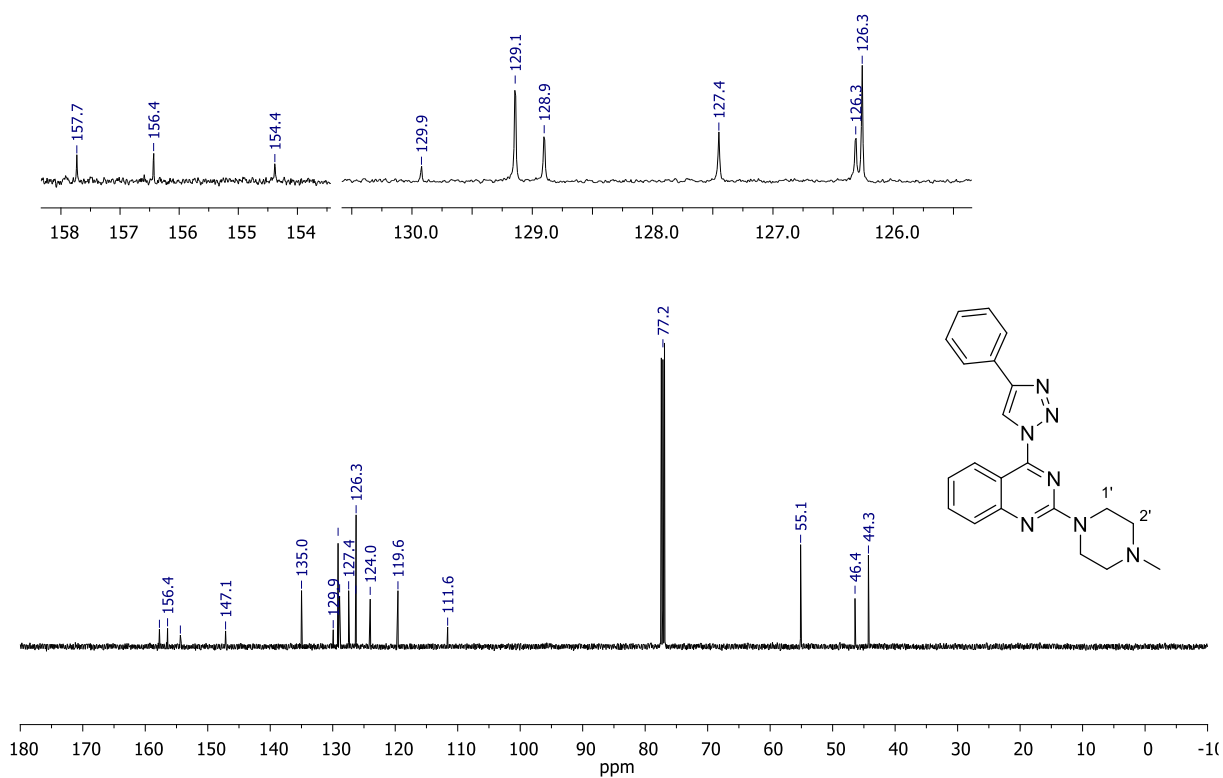


**4-(4-Phenyl-1H-1,2,3-triazol-1-yl)-2-(4-methylpiperazin-1-yl)quinazoline (14b)**

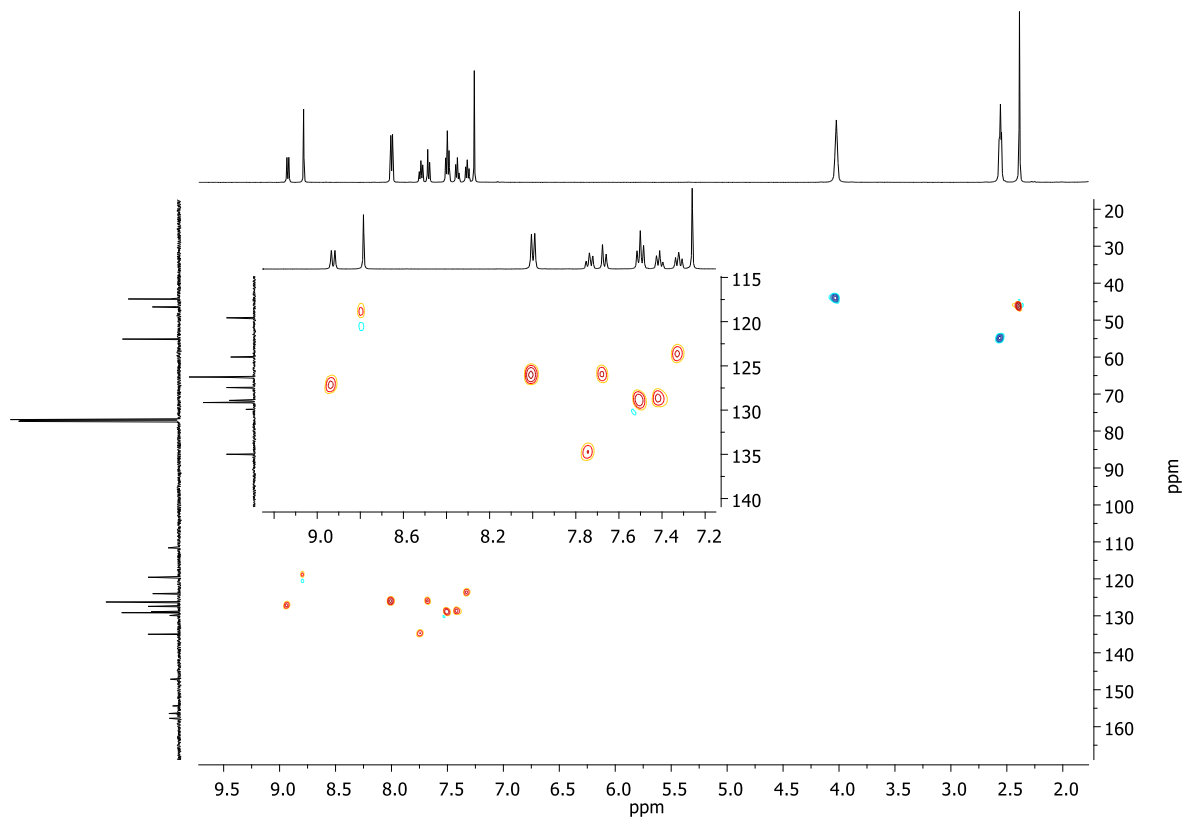
**<sup>1</sup>H-NMR (500 MHz, CDCl<sub>3</sub>) spectrum of compound 14b:**



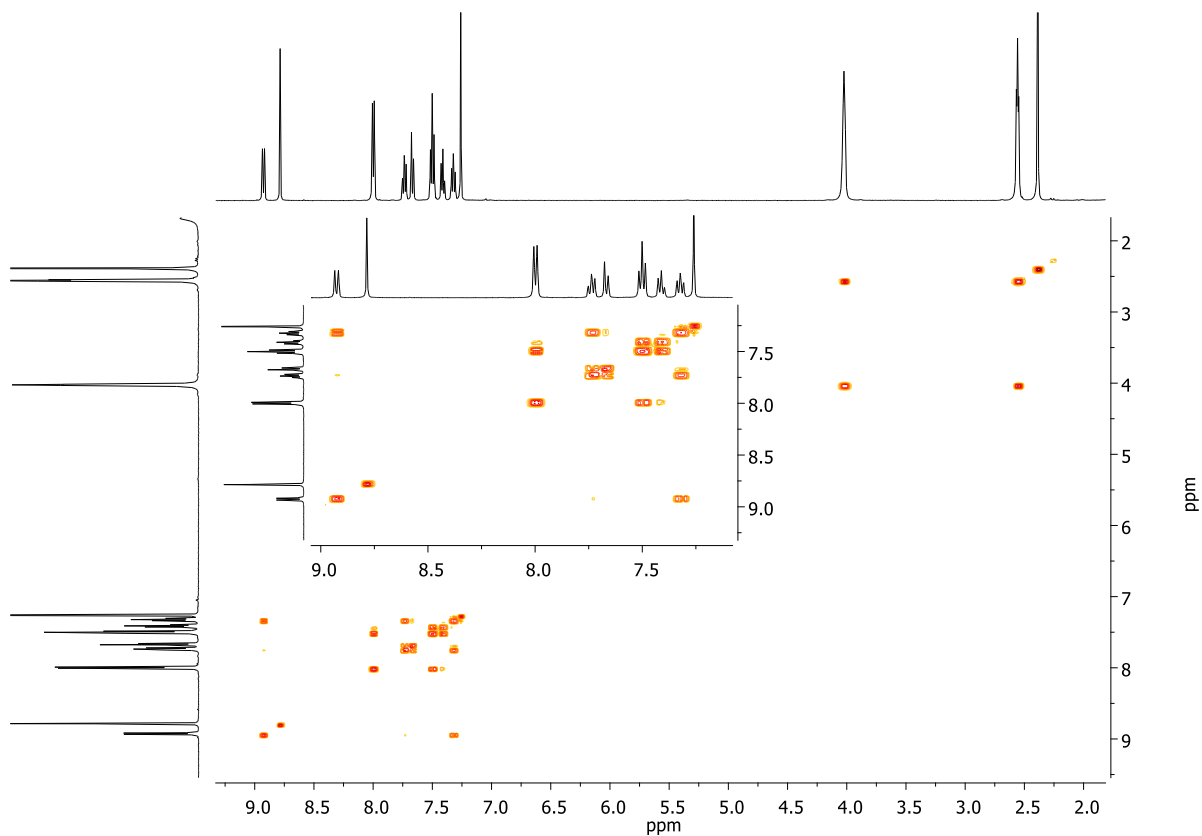
**<sup>13</sup>C-NMR (125.7 MHz, CDCl<sub>3</sub>) spectrum of compound 14b:**



**HSQC spectrum of compound 14b:**

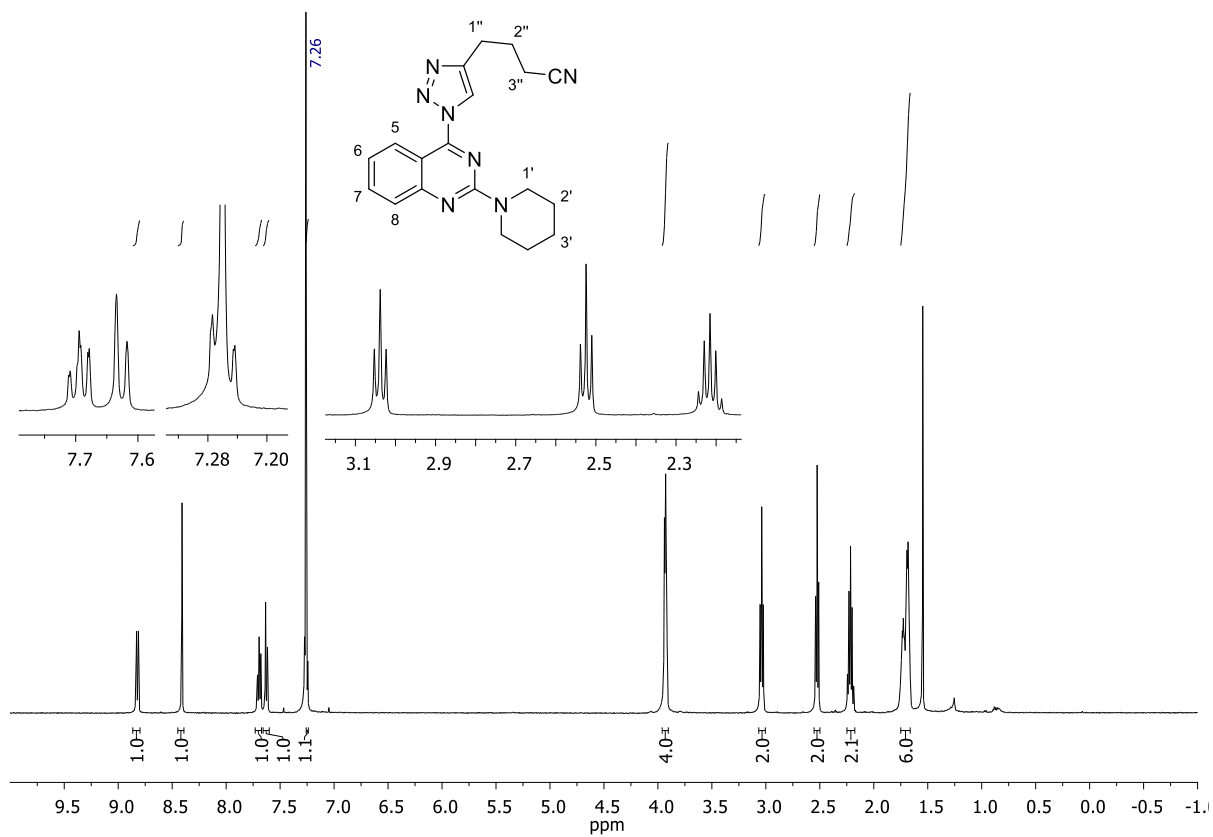


**COSY spectrum of compound 14b:**

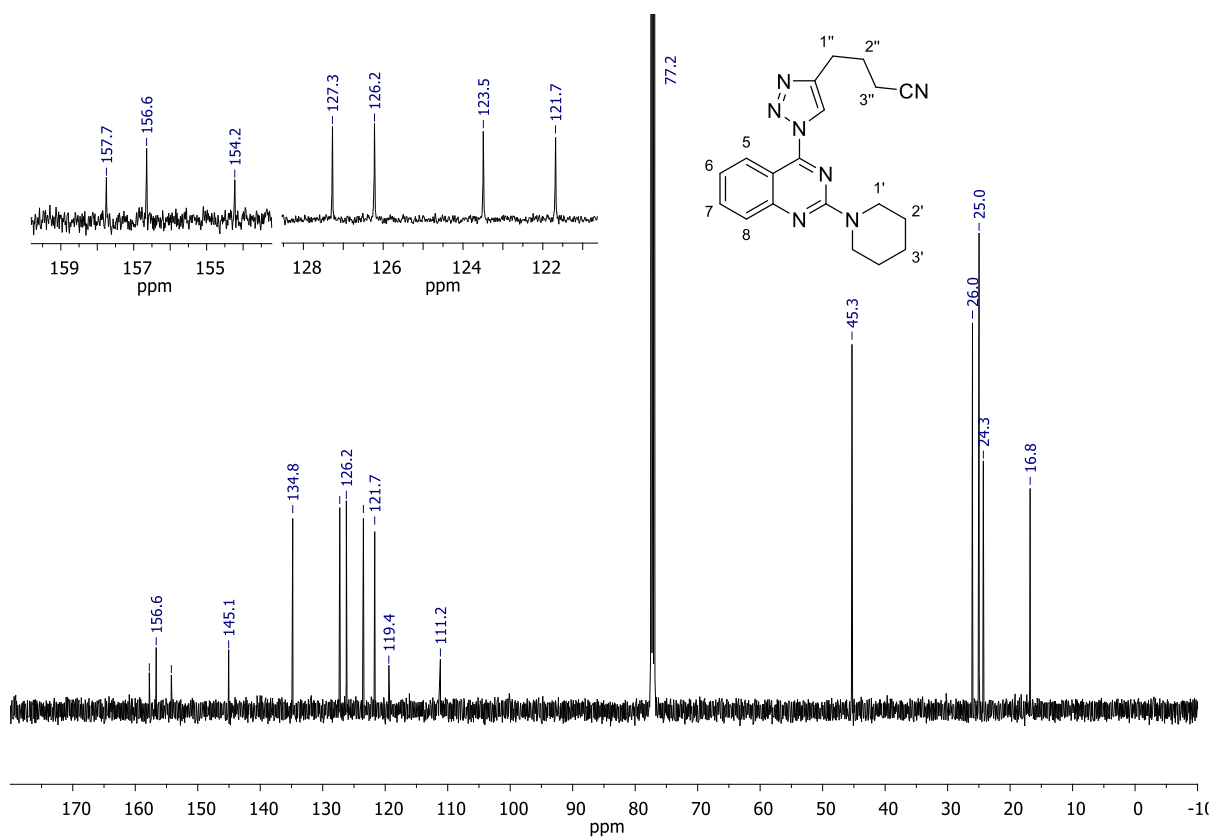


**4-[4-(3-Cyanoprop-1-yl)-1H-1,2,3-triazol-1-yl]-2-(piperidin-1-yl)quinazoline (14c)**

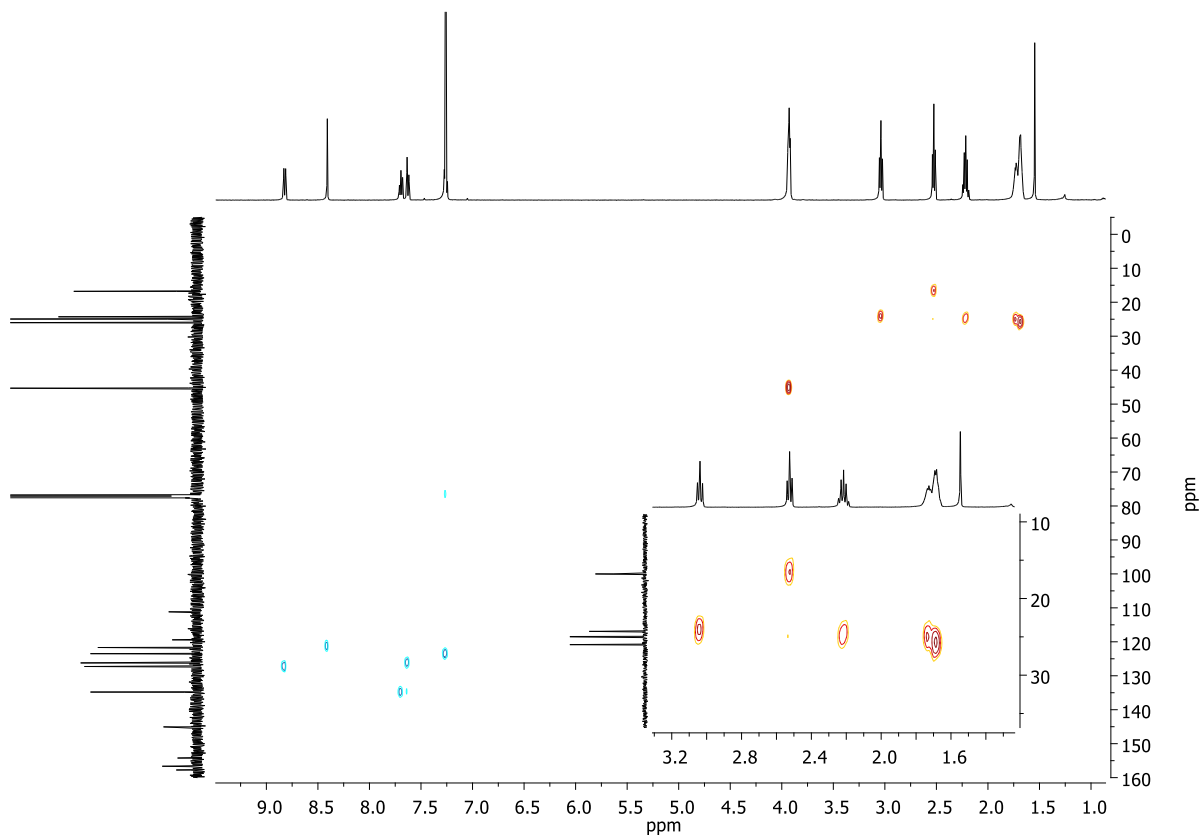
**<sup>1</sup>H-NMR (500 MHz, CDCl<sub>3</sub>) spectrum of compound 14c:**



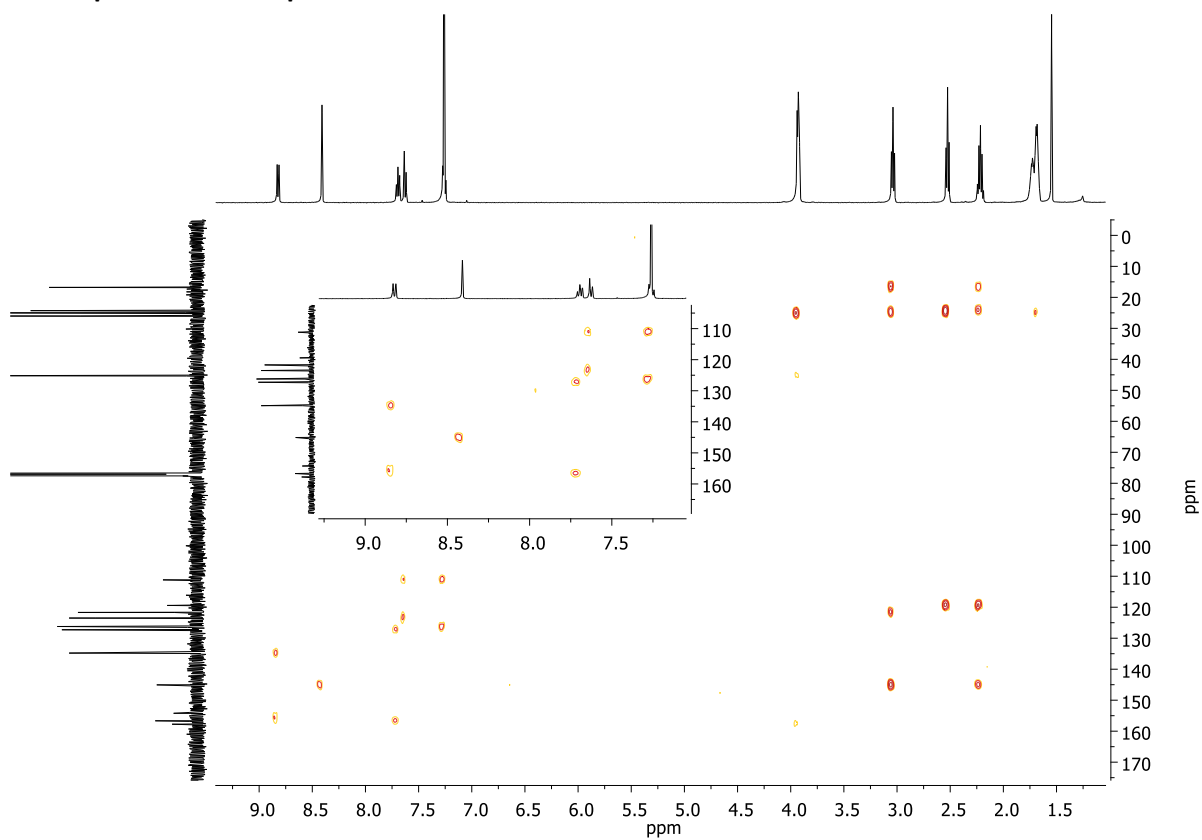
**$^{13}\text{C}$ -NMR (125.7 MHz,  $\text{CDCl}_3$ ) spectrum of compound 14c:**



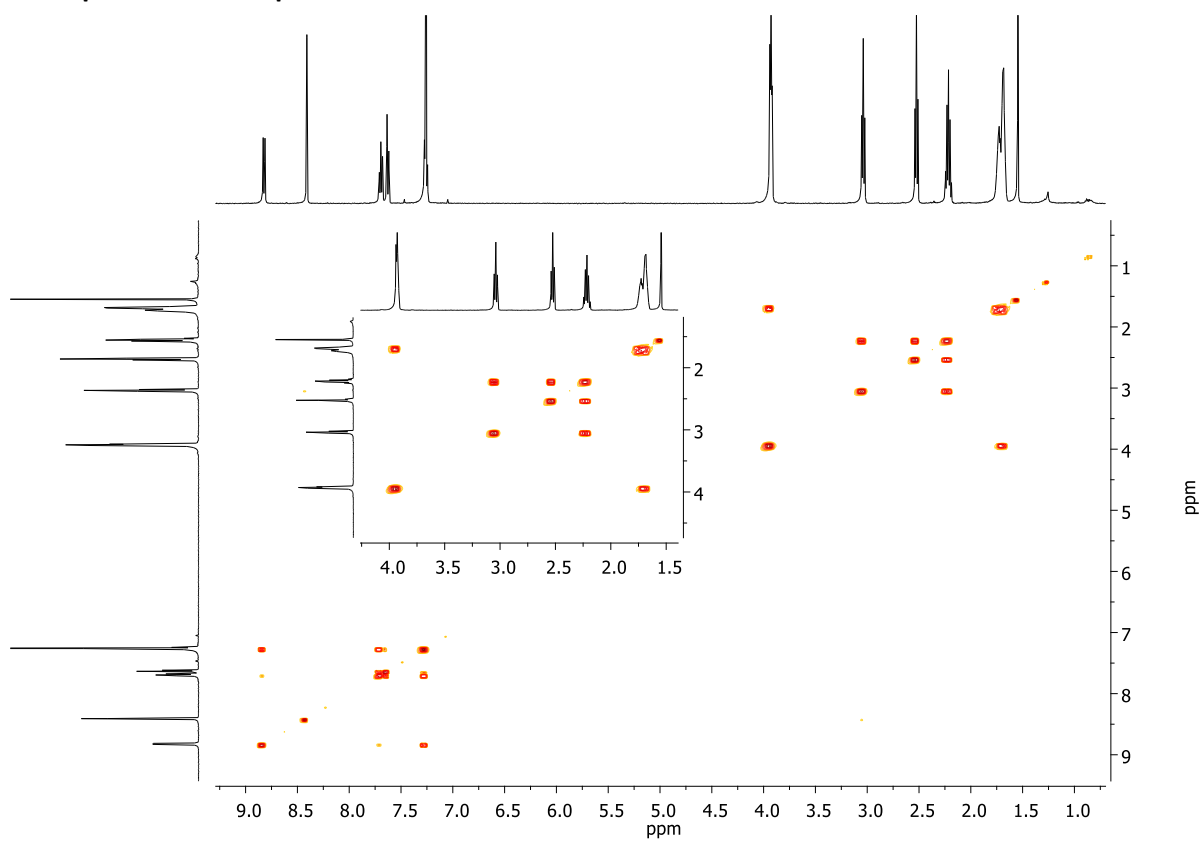
**HSQC spectrum of compound 14c:**



HMBC spectrum of compound 14c:



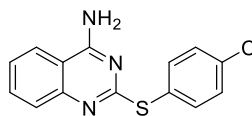
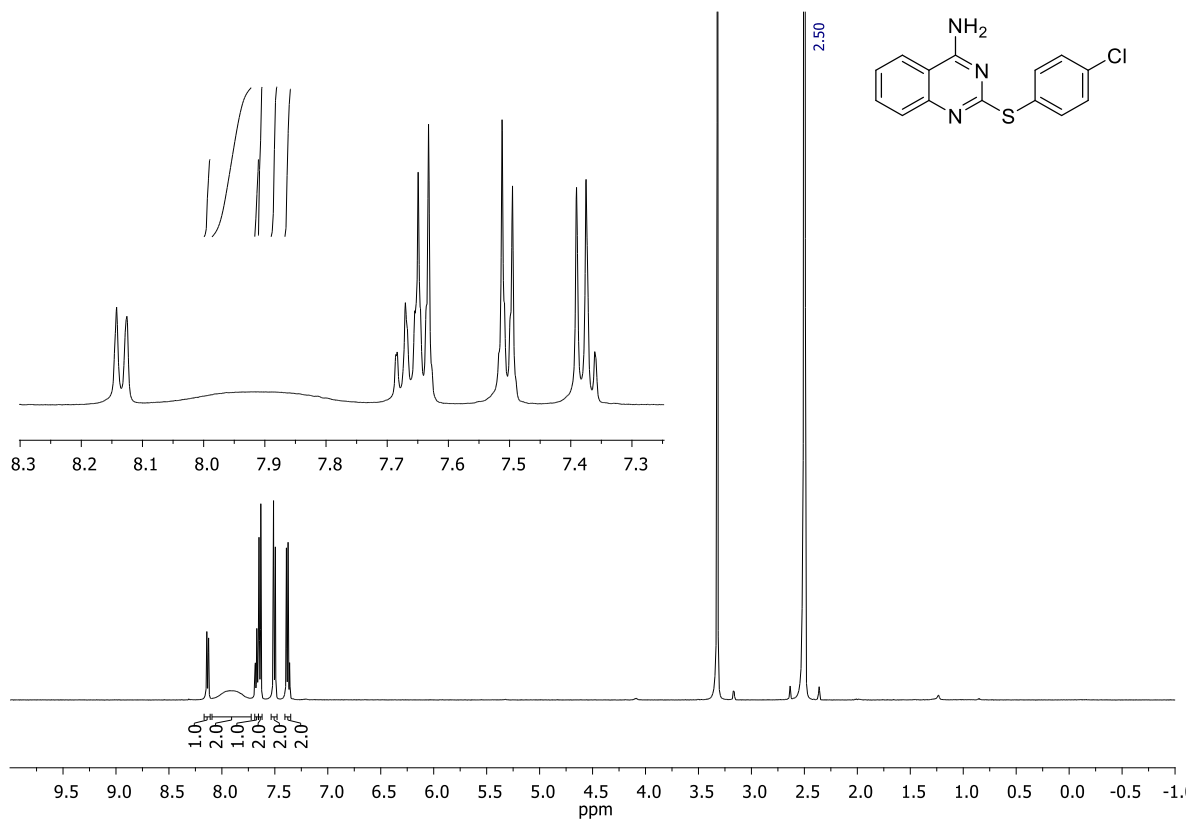
COSY spectrum of compound 14c:



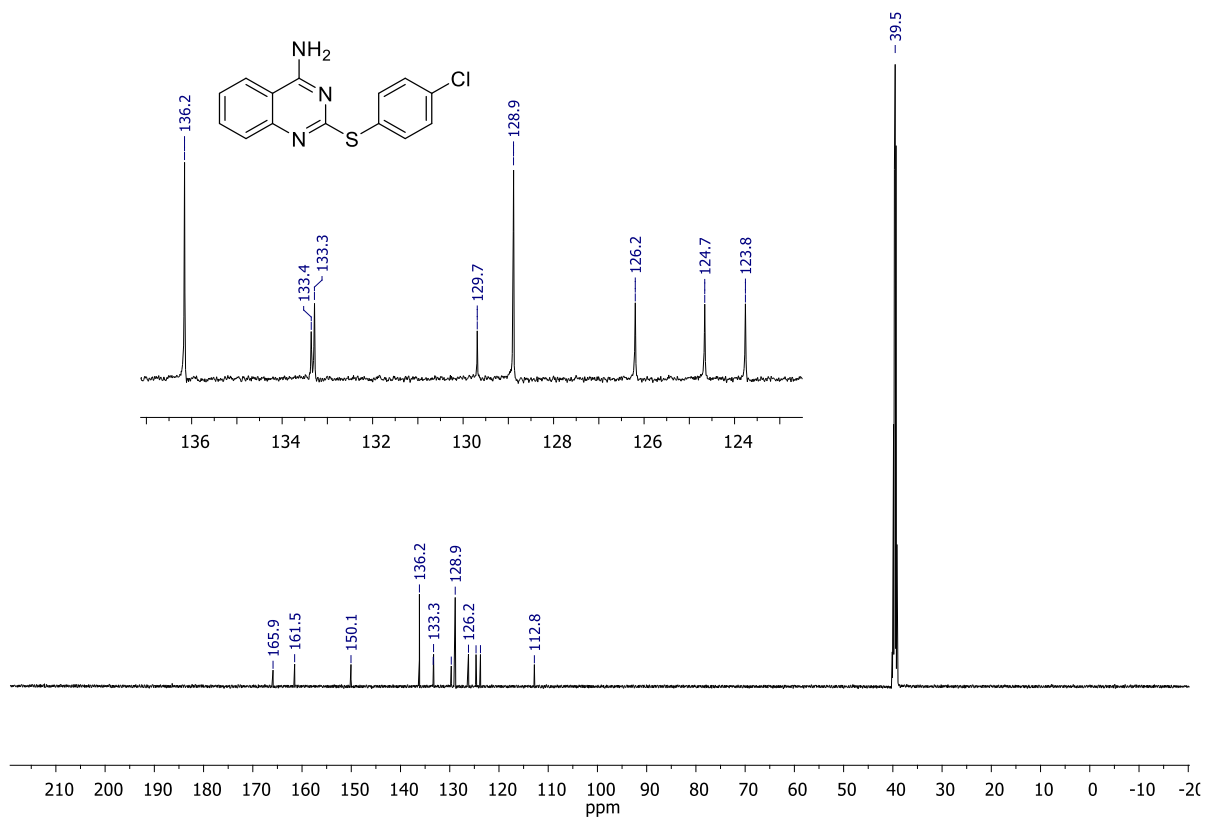


### 4-Amino-2-[(4-chlorophenyl)thio]quinazoline (15)

<sup>1</sup>H-NMR (500 MHz, DMSO-d<sub>6</sub>) spectrum of compound 15:



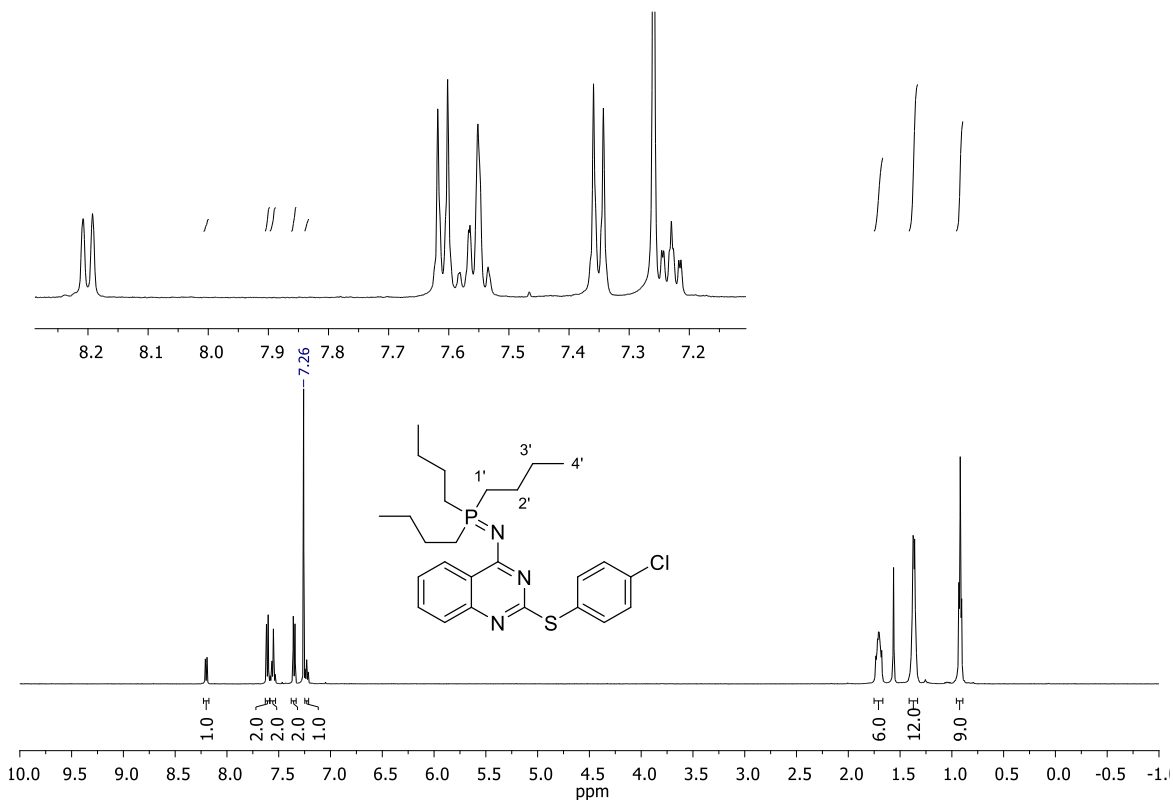
<sup>13</sup>C-NMR (125.7 MHz, DMSO-d<sub>6</sub>) spectrum of compound 15:



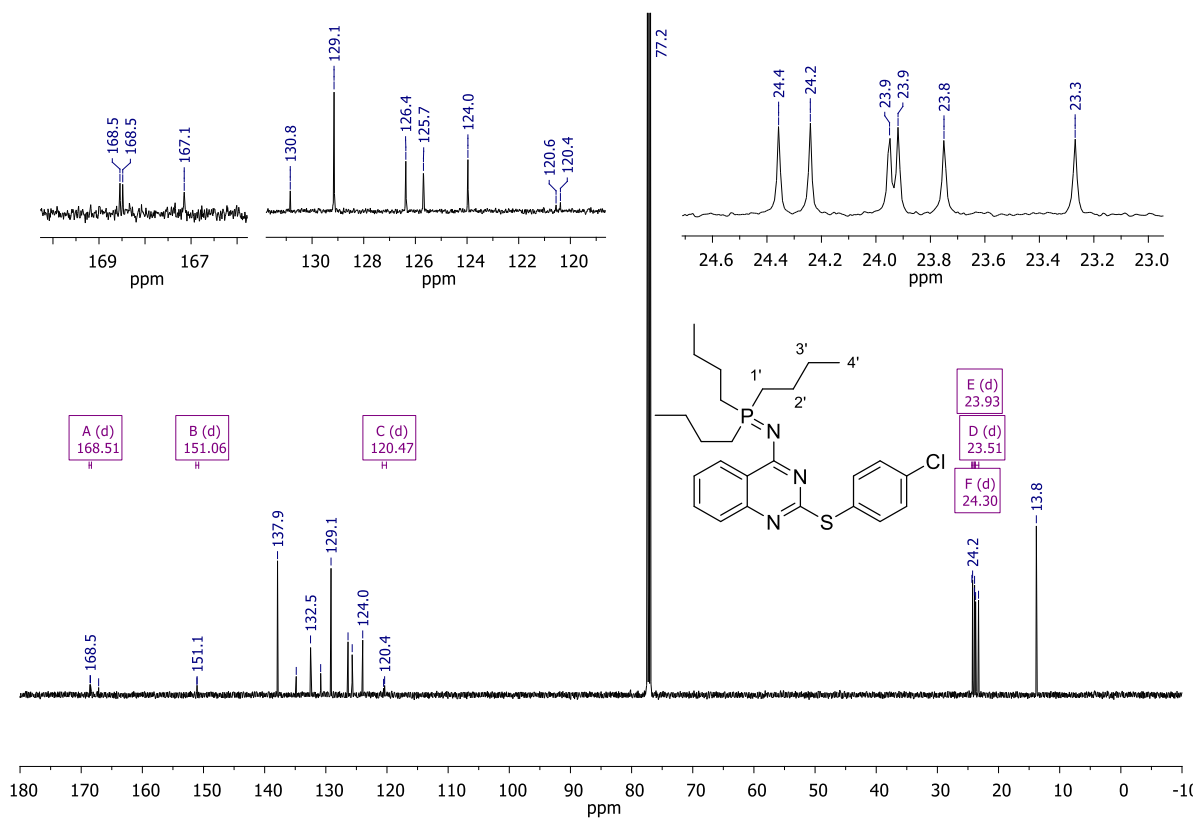
## Quinazoline iminophosphoranes

### 2-[(4-Chlorophenyl)thio]-4-[(tributylphosphoronylidene)amino]quinazoline (16a)

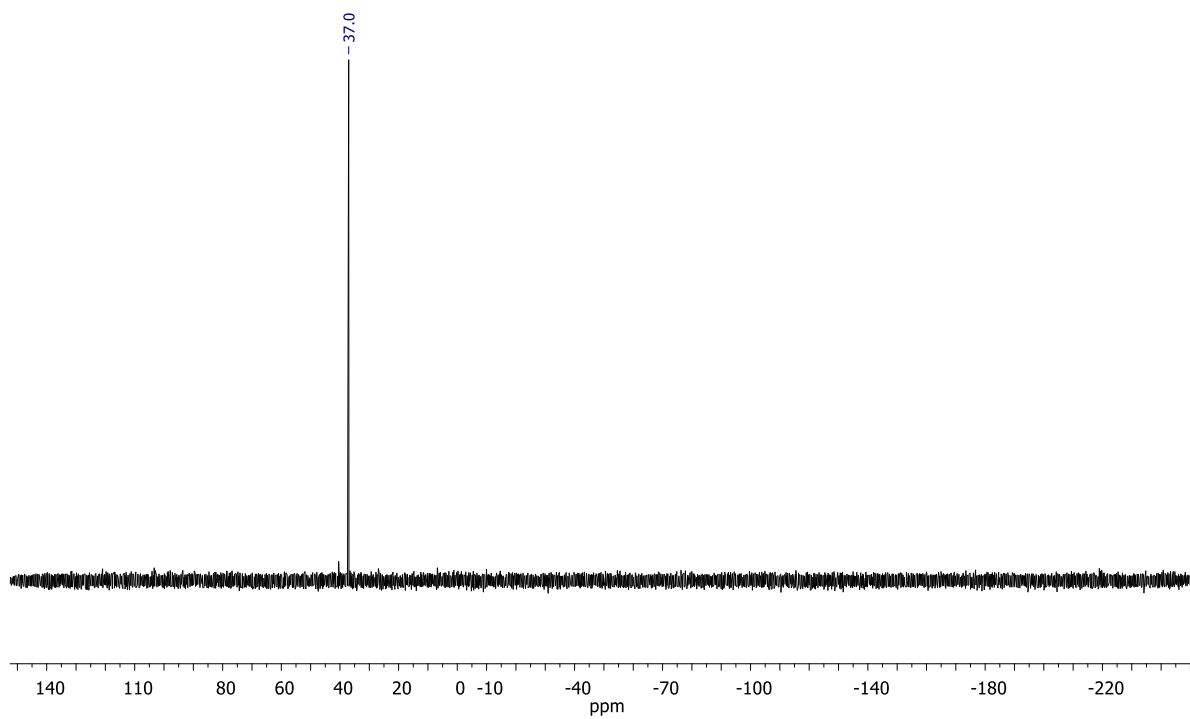
$^1\text{H-NMR}$  (500 MHz,  $\text{CDCl}_3$ ) spectrum of compound 16a:



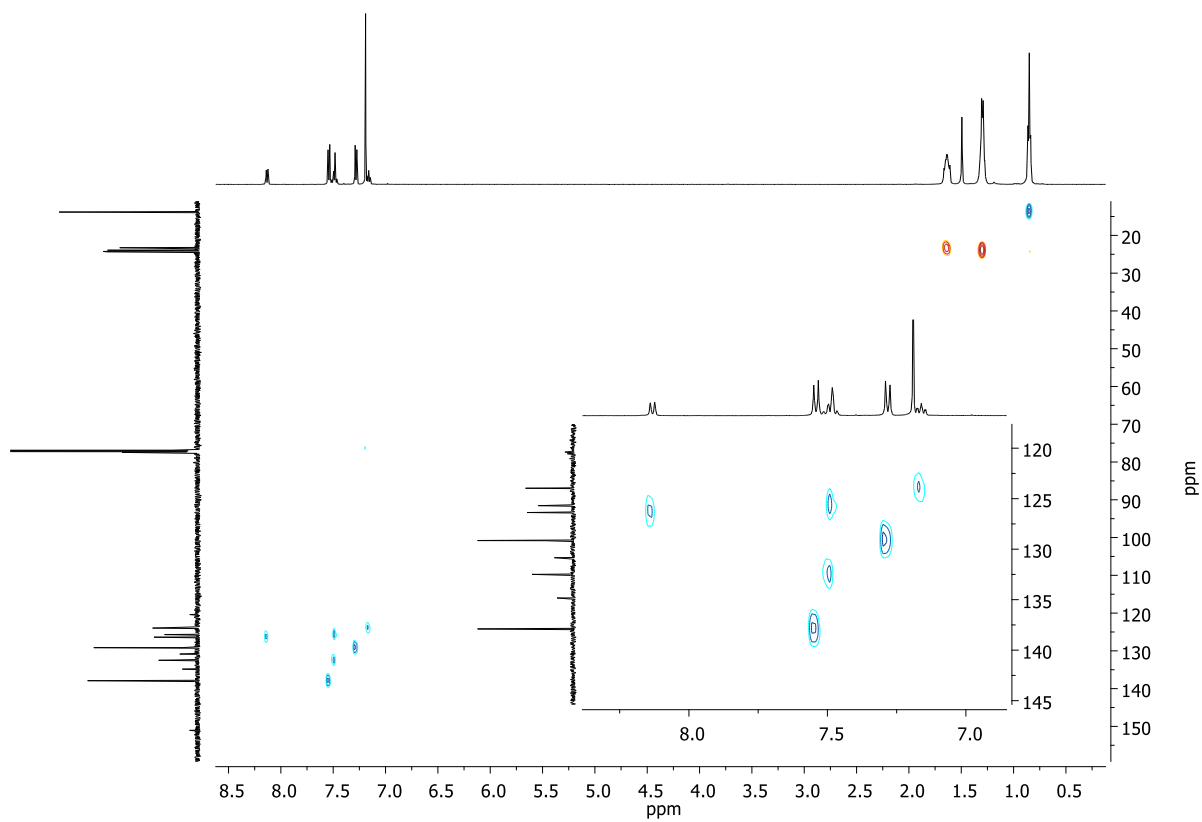
$^{13}\text{C-NMR}$  (125.7 MHz,  $\text{CDCl}_3$ ) spectrum of compound 16a:



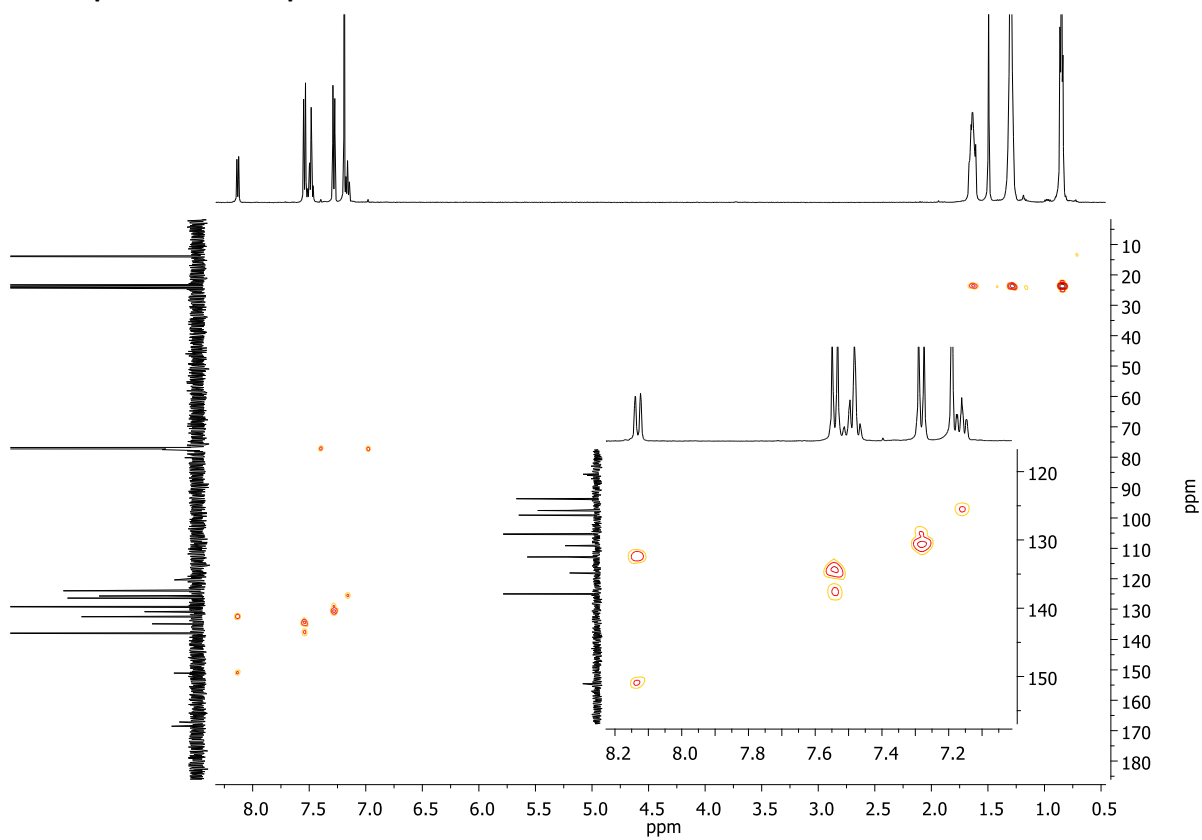
**$^{31}\text{P}$ -NMR (202 MHz,  $\text{CDCl}_3$ ) spectrum of compound 16a:**



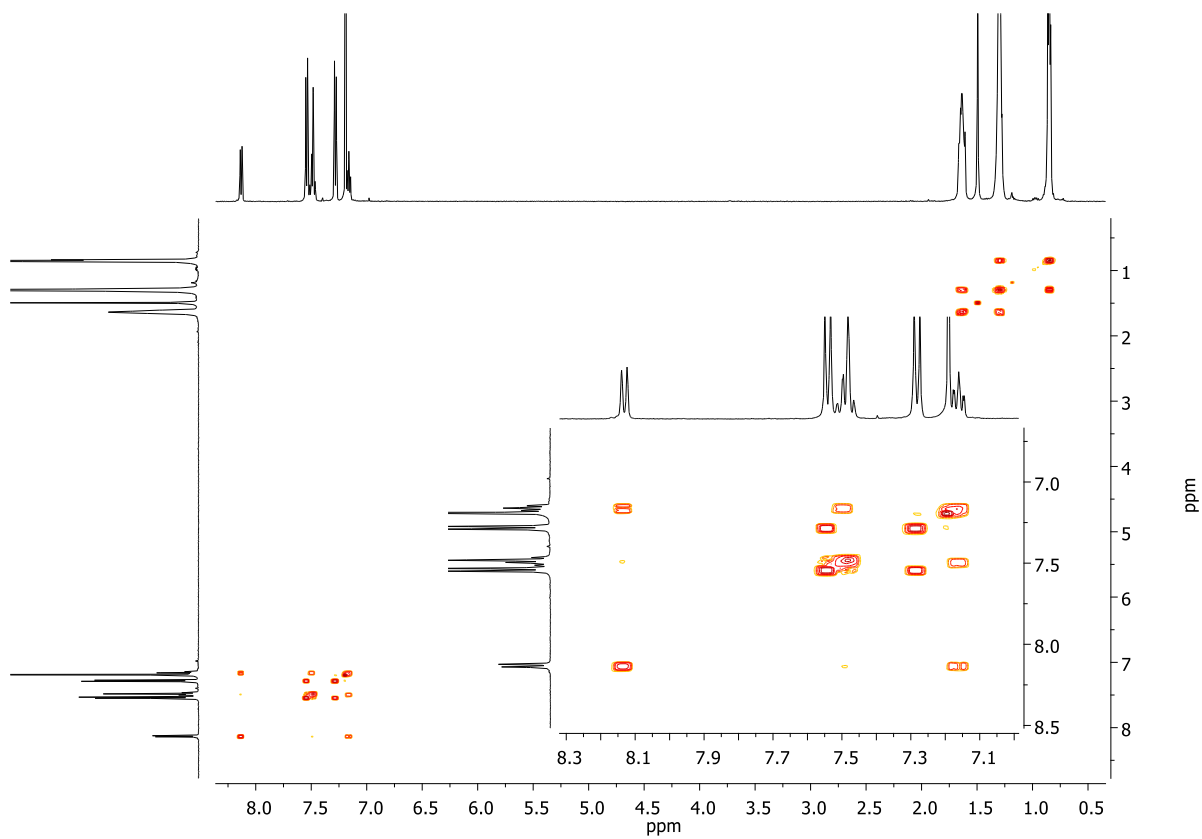
**HSQC spectrum of compound 16a:**



HMBC spectrum of compound 16a:

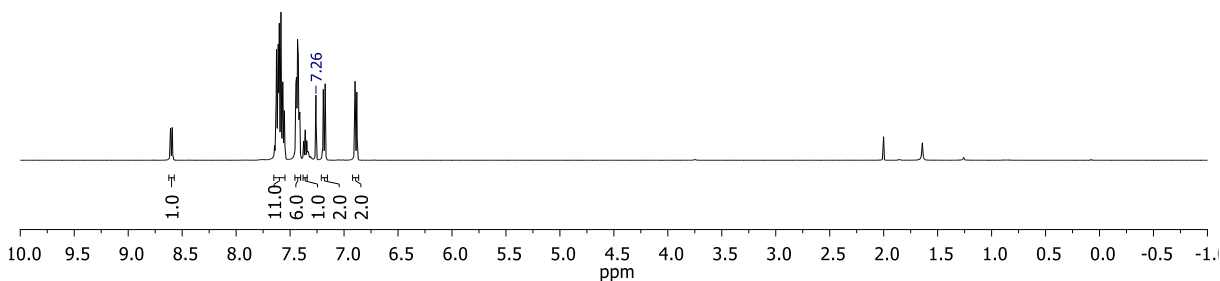
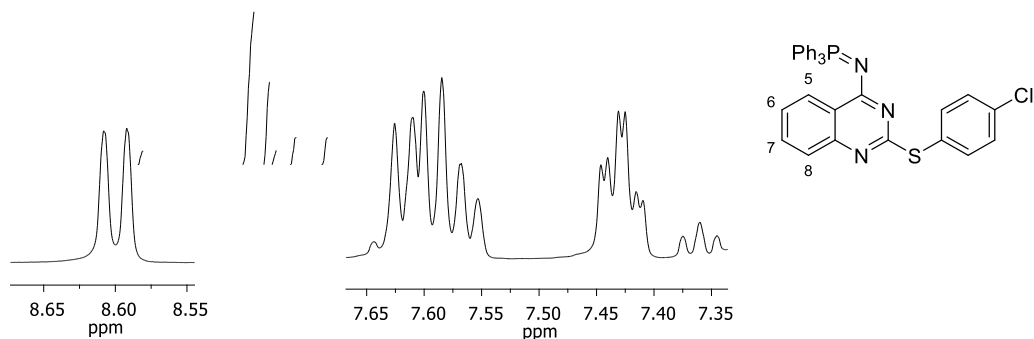


COSY spectrum of compound 16a:

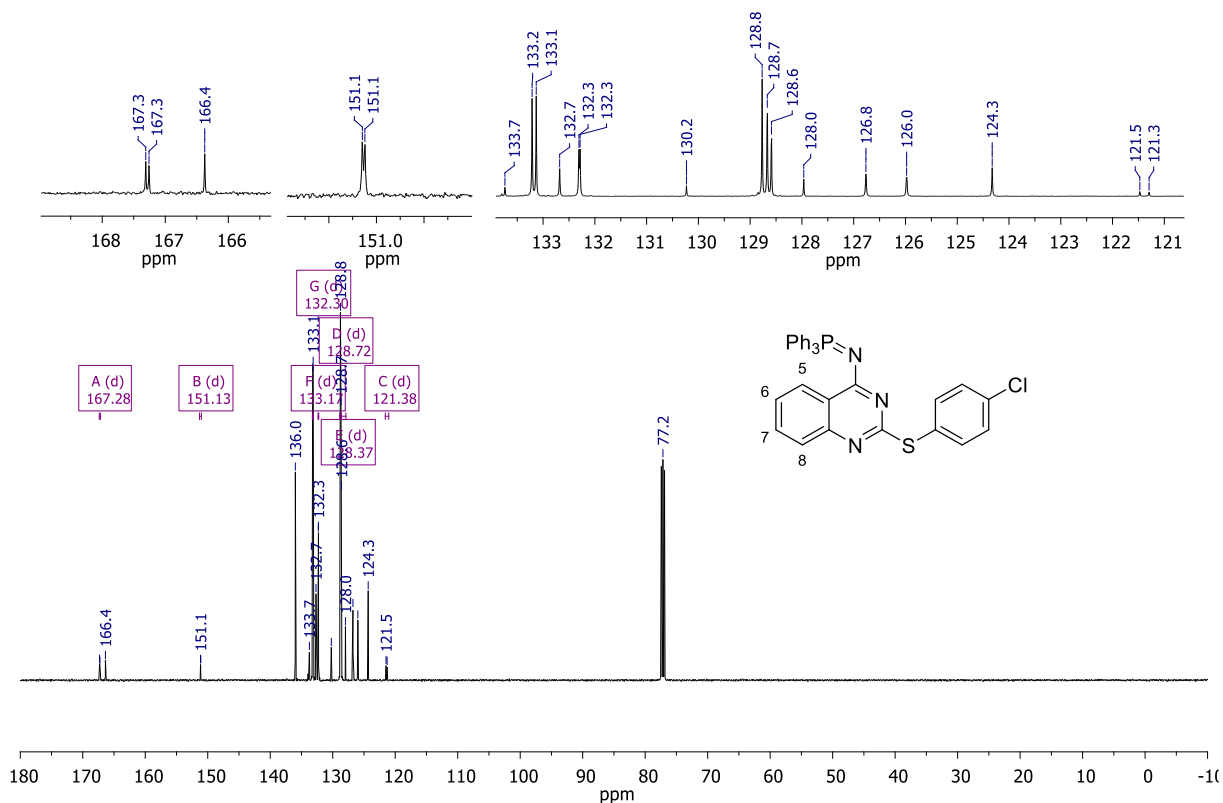


## 2-[(4-Chlorophenyl)thio]-4-[(triphenylphosphoronylidene)amino]quinazoline (16b)

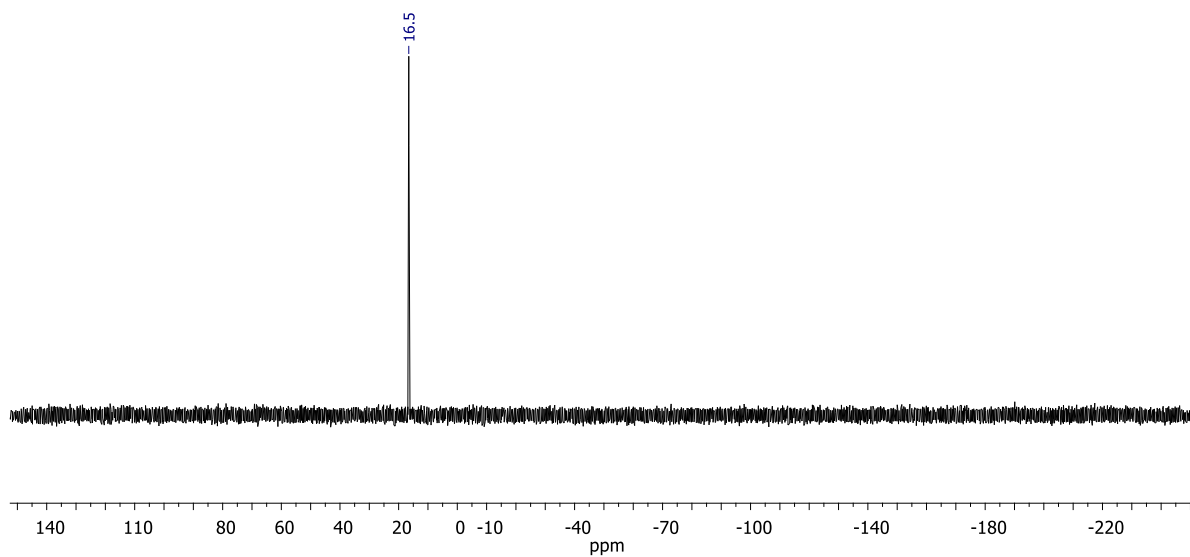
$^1\text{H-NMR}$  (500 MHz,  $\text{CDCl}_3$ ) spectrum of compound 16b:



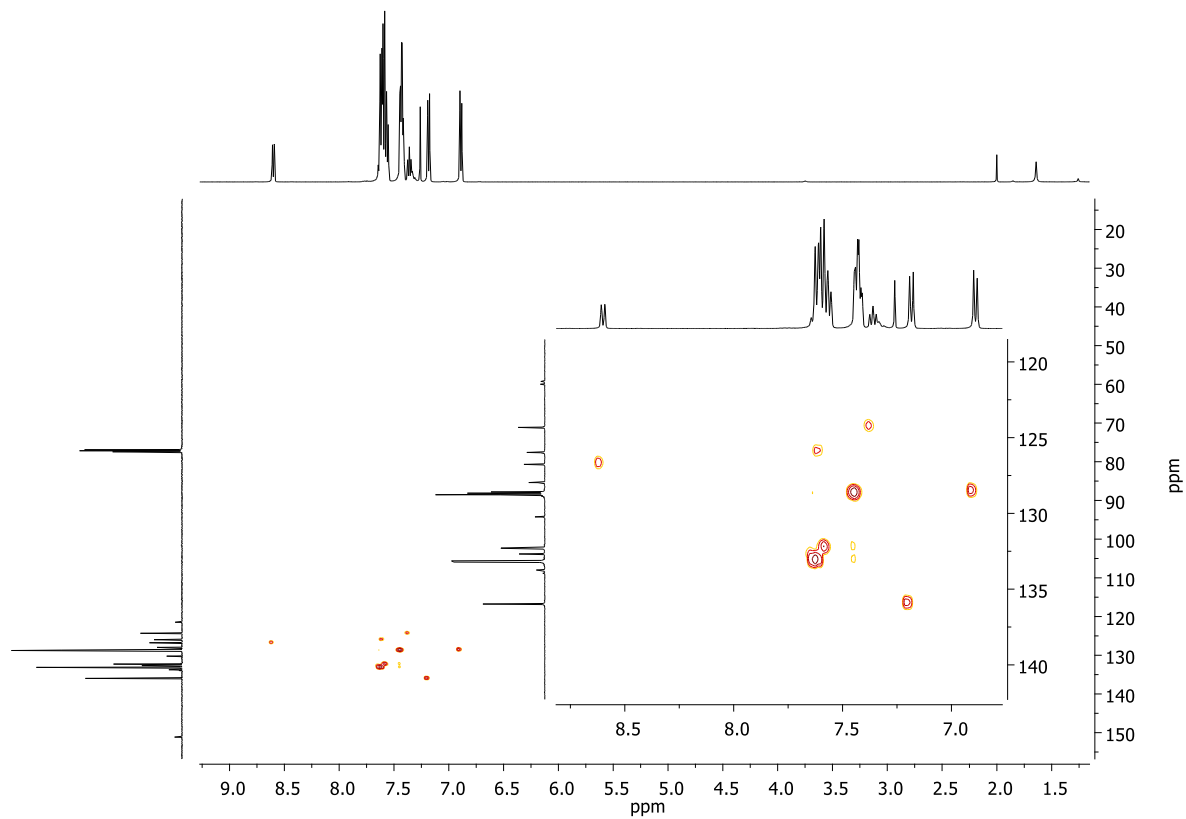
$^{13}\text{C-NMR}$  (125.7 MHz,  $\text{CDCl}_3$ ) spectrum of compound 16b:



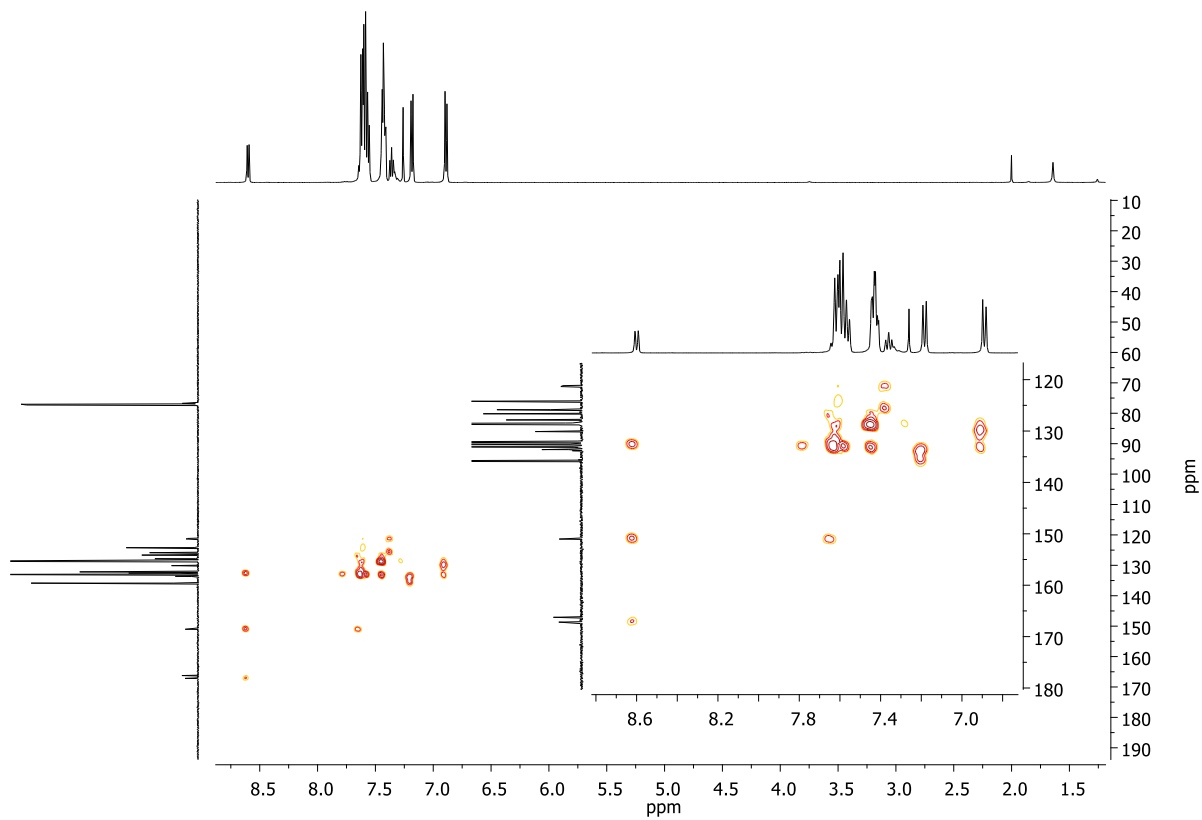
**$^{31}\text{P}$ -NMR (202 MHz,  $\text{CDCl}_3$ ) spectrum of compound 16b:**



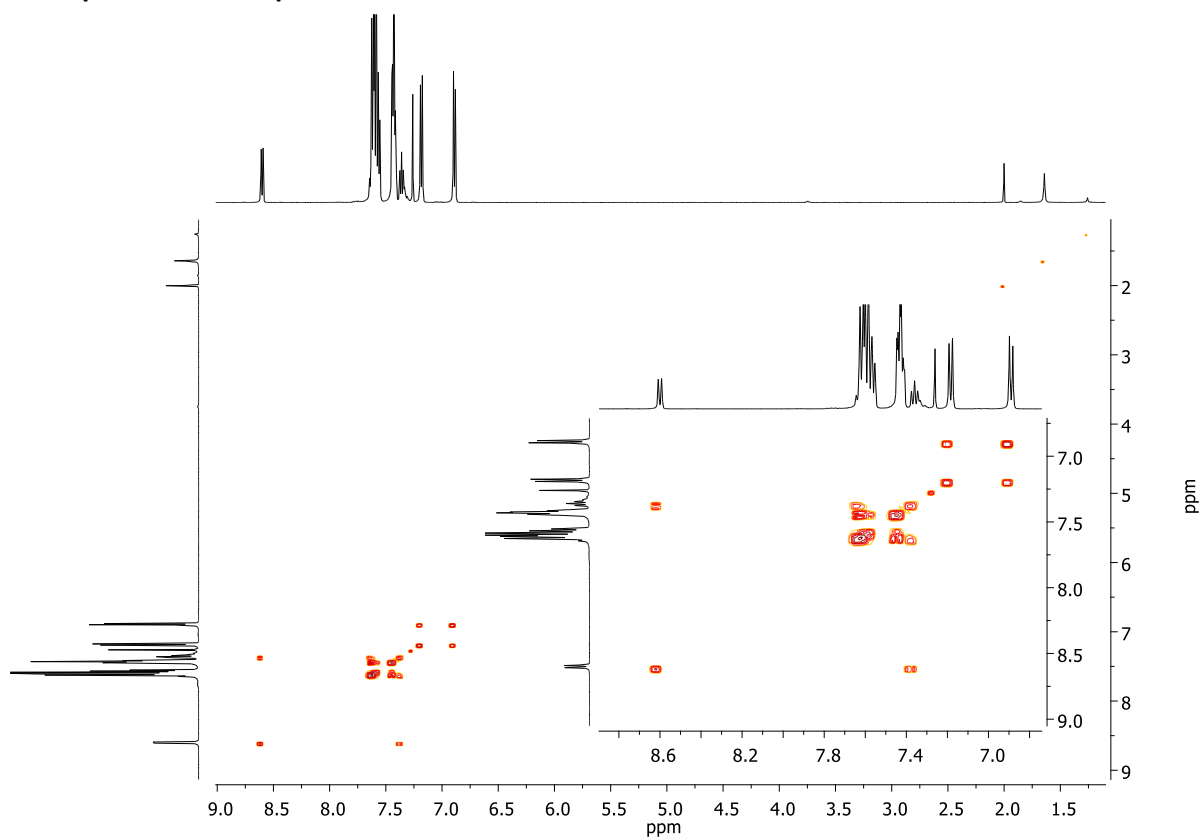
**HSQC spectrum of compound 16b:**



HMBC spectrum of compound 16b:



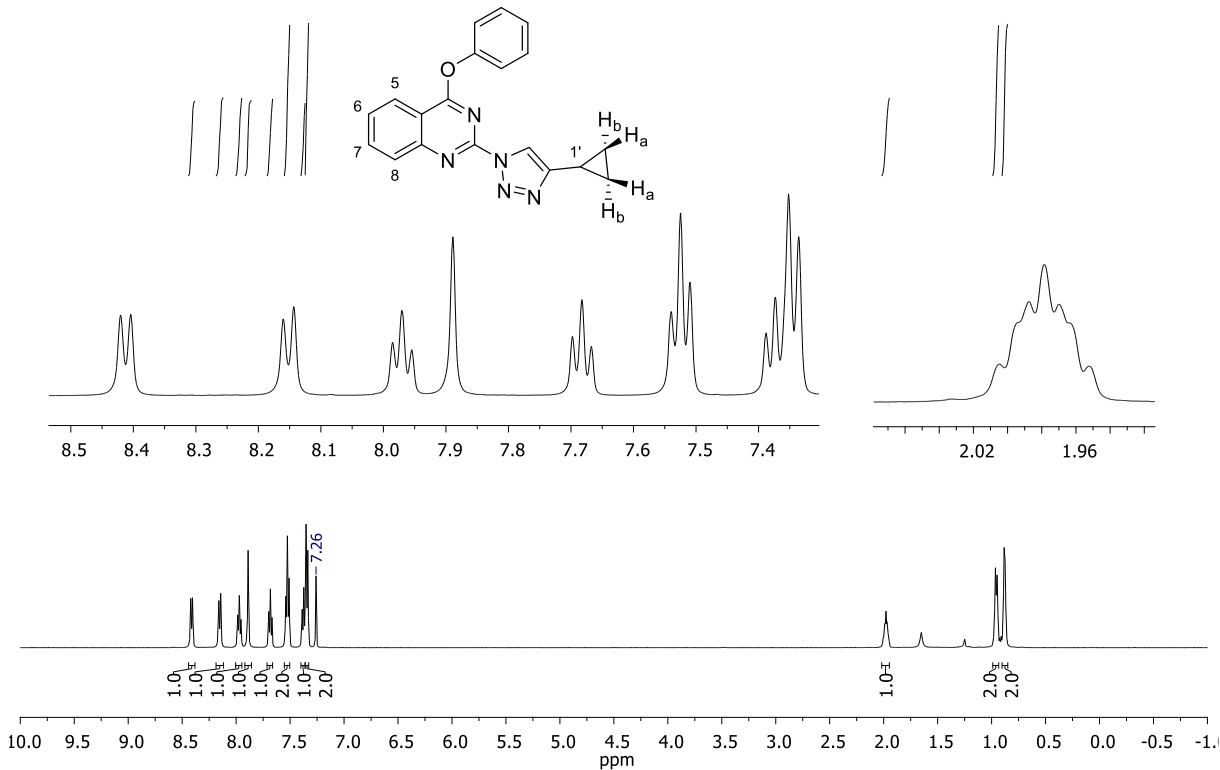
COSY spectrum of compound 16b:



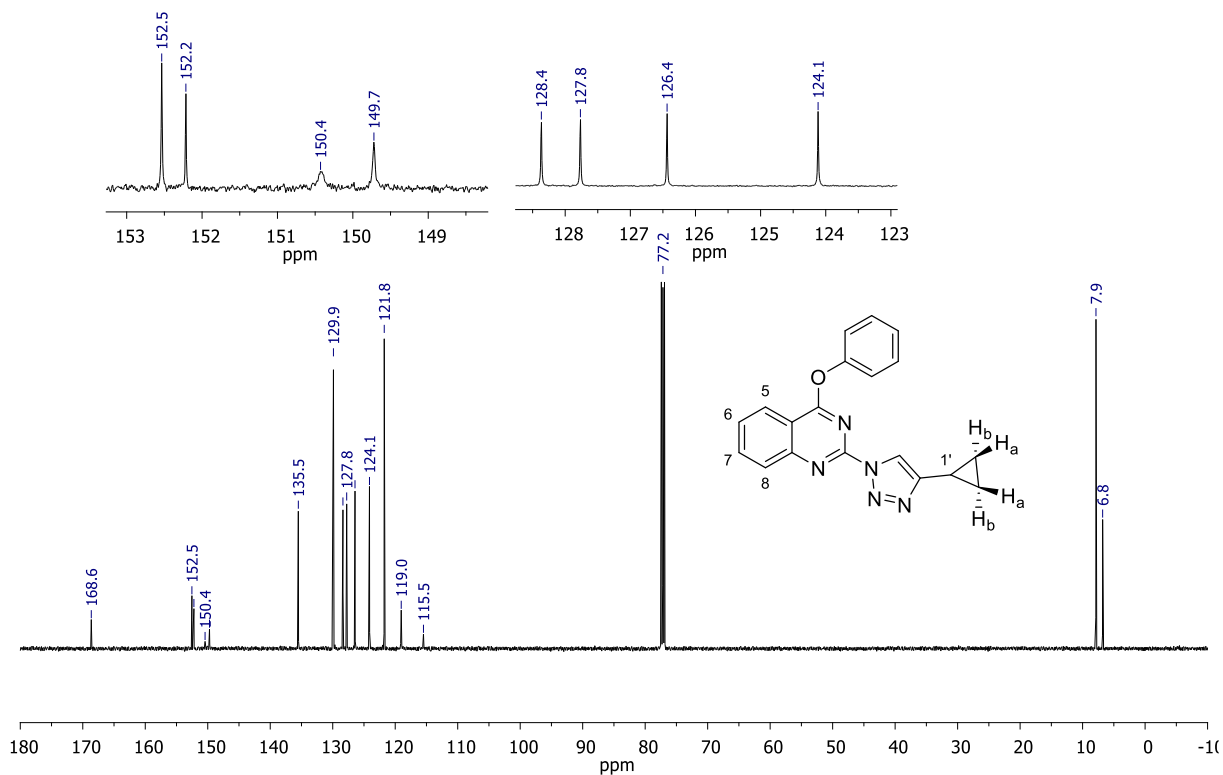
# 4-(Alkyl/Aryloxy)-2-(1*H*-1,2,3-triazol-1-yl)quinazolines

## 2-(4-Cyclopropyl-1*H*-1,2,3-triazol-1-yl)-4-(phenyloxy)quinazoline (17a)

<sup>1</sup>H-NMR (500 MHz, CDCl<sub>3</sub>) spectrum of compound 17a:

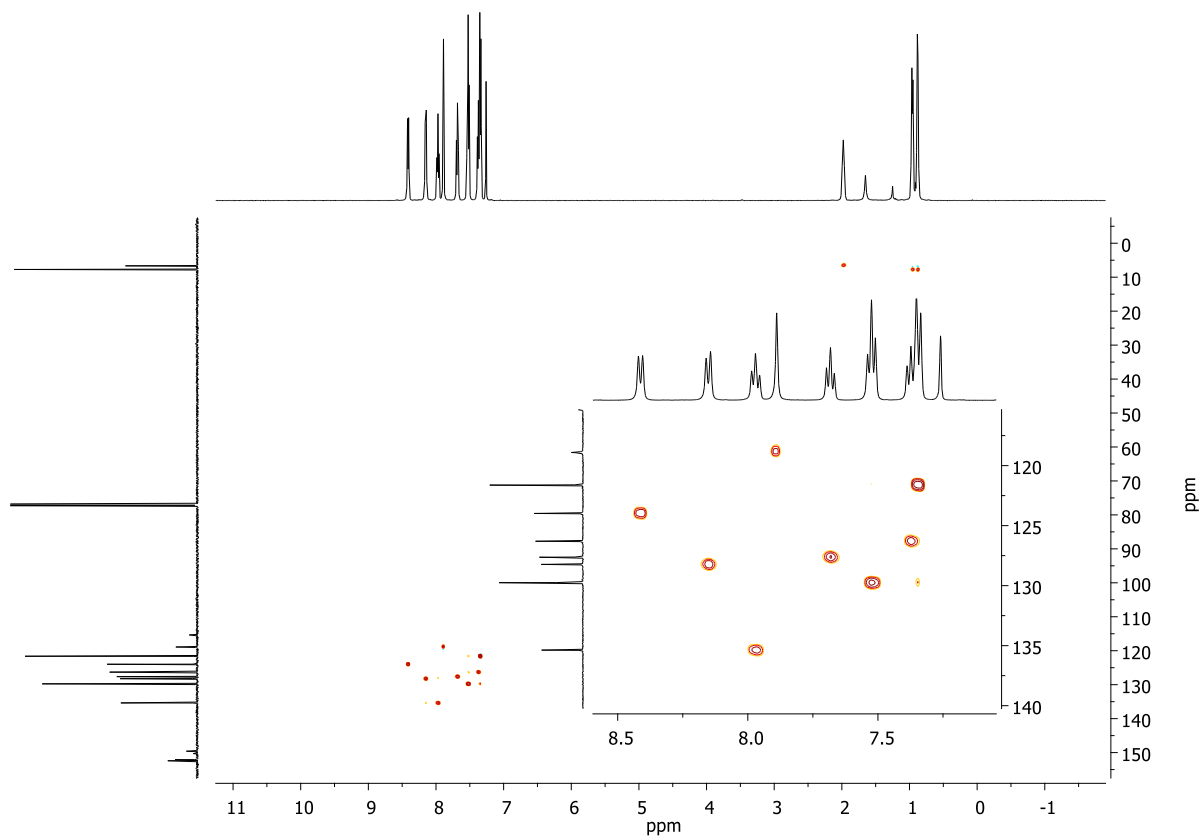


<sup>13</sup>C-NMR (125.7 MHz, CDCl<sub>3</sub>) spectrum of compound 17a:

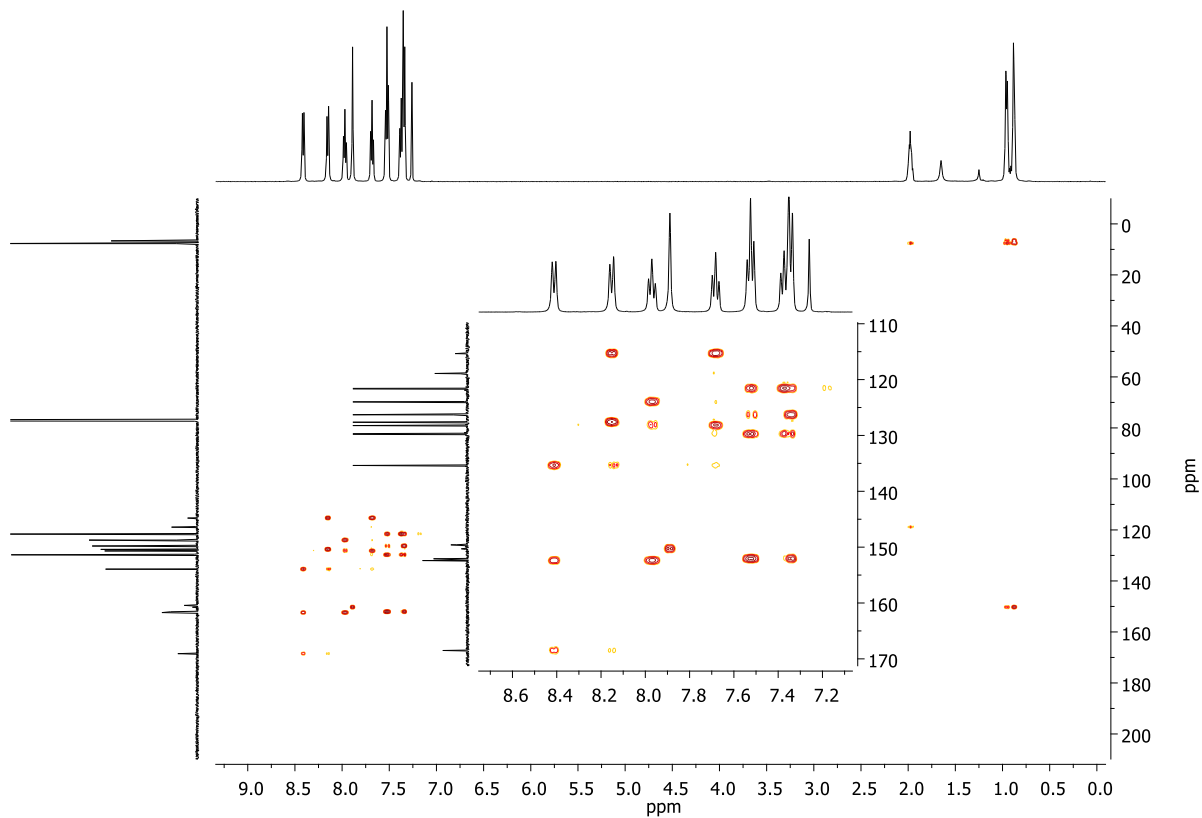




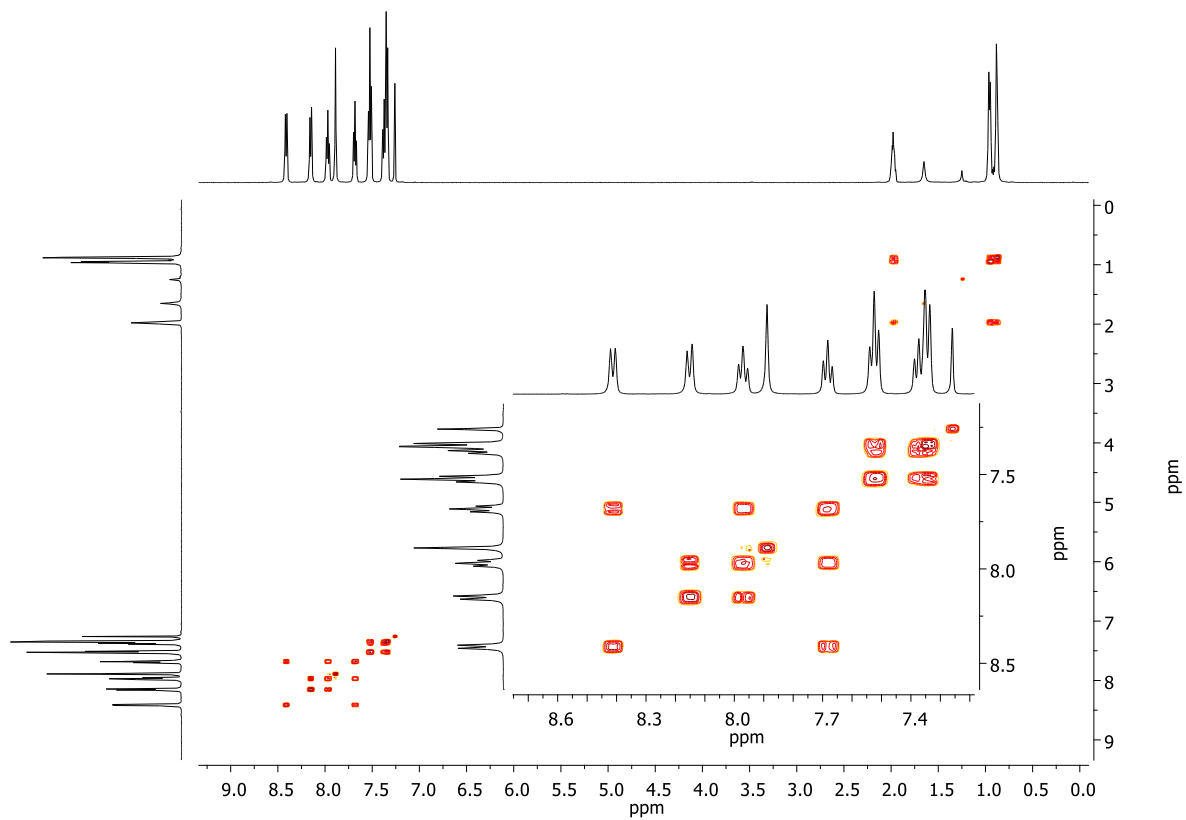
HSQC spectrum of compound 17a:



HMBC spectrum of compound 17a:

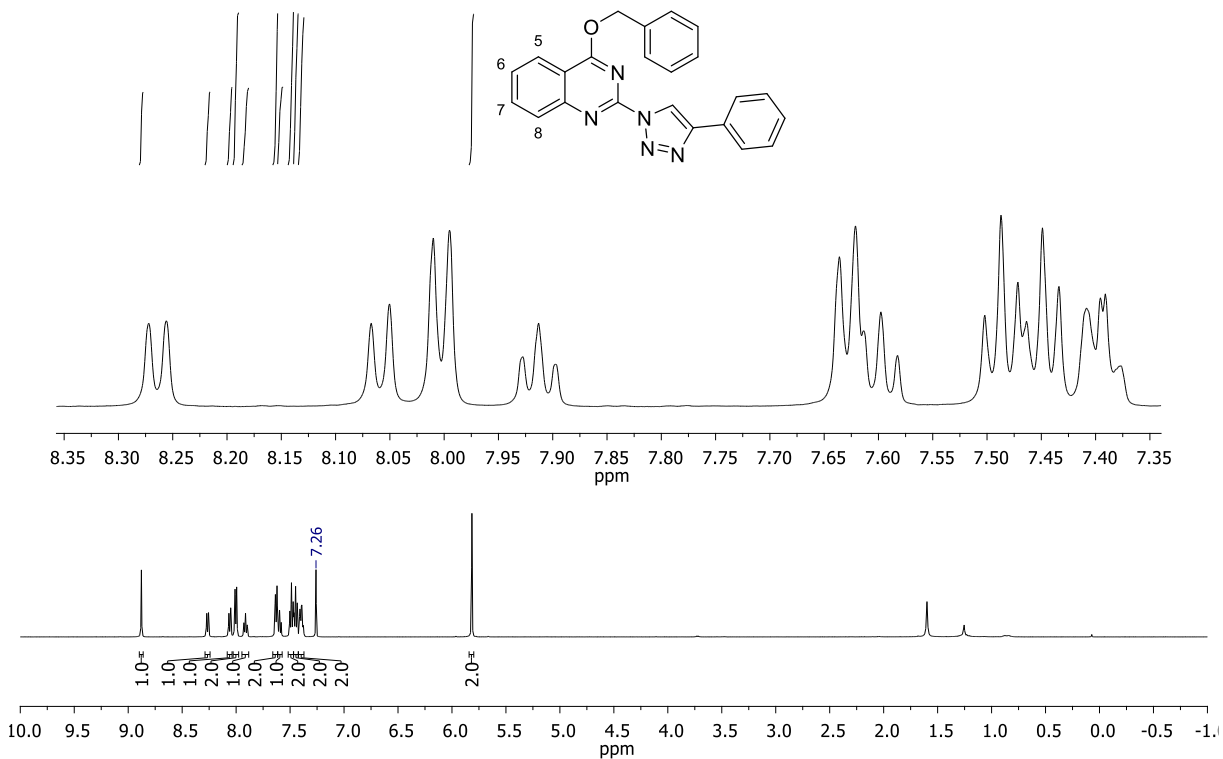


COSY spectrum of compound 17a:

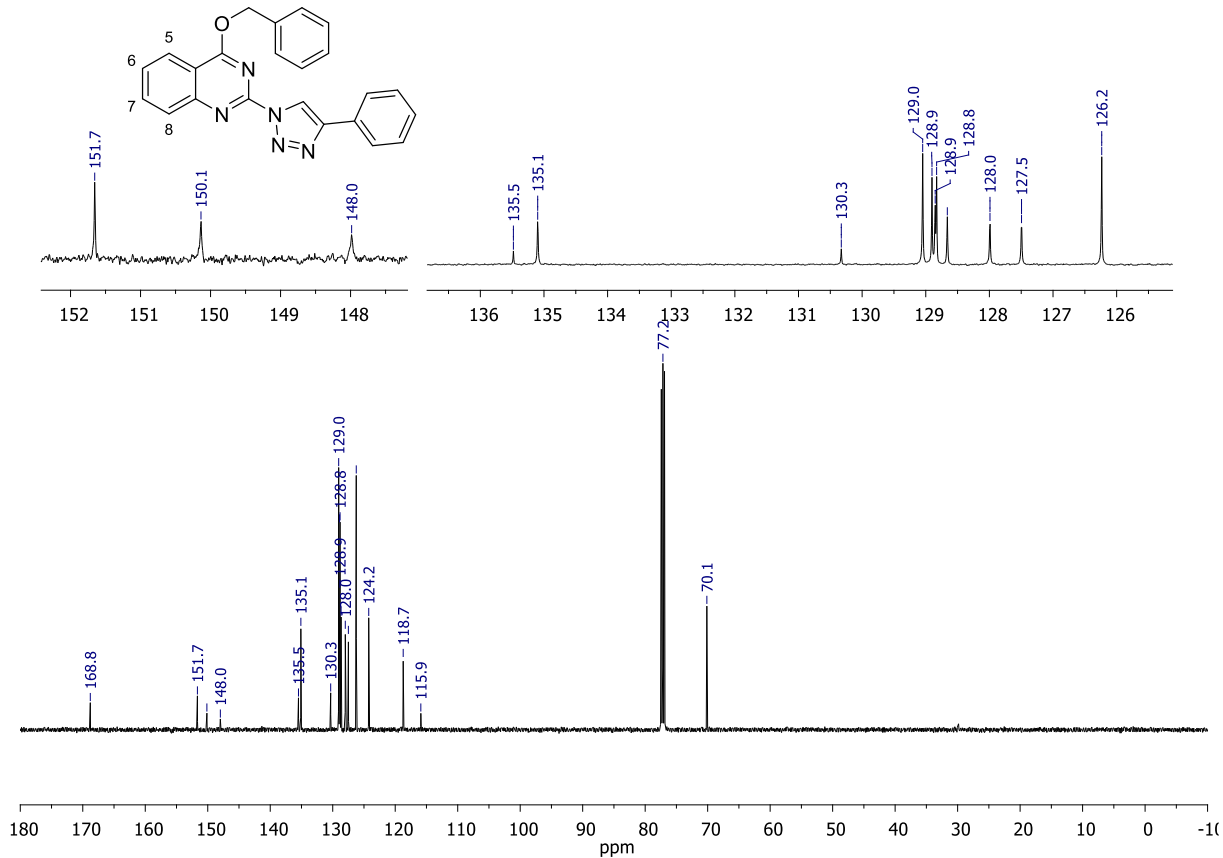


### 4-(Benzyloxy)-2-(4-phenyl-1H-1,2,3-triazol-1-yl)quinazoline (17b)

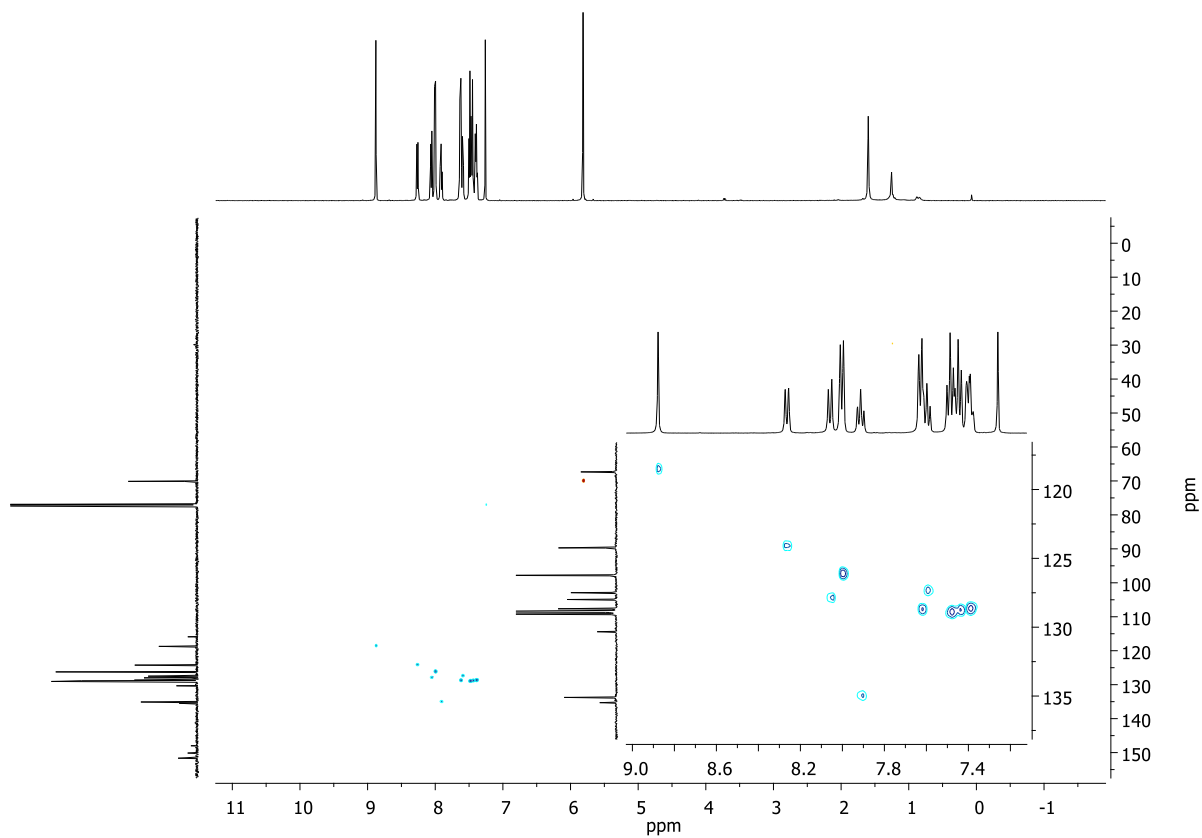
<sup>1</sup>H-NMR (500 MHz, CDCl<sub>3</sub>) spectrum of compound 17b:



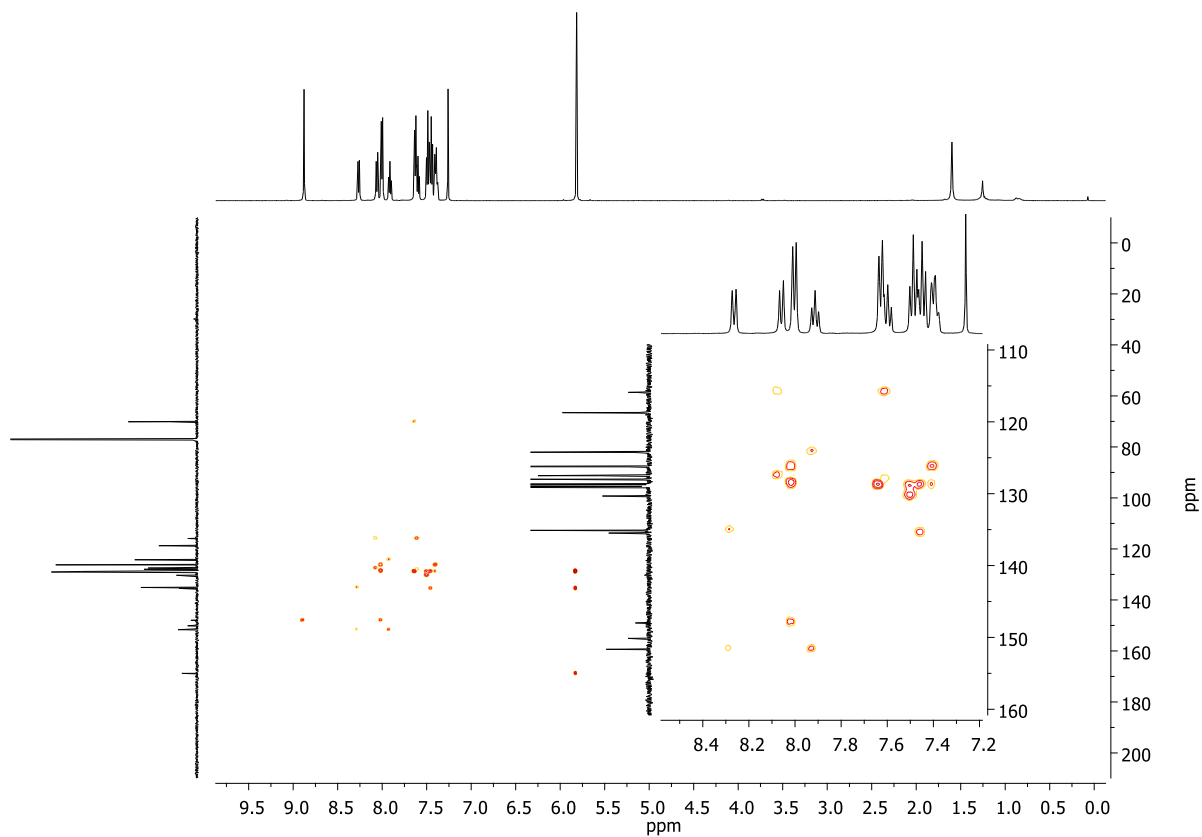
<sup>13</sup>C-NMR (125.7 MHz, CDCl<sub>3</sub>) spectrum of compound 17b:



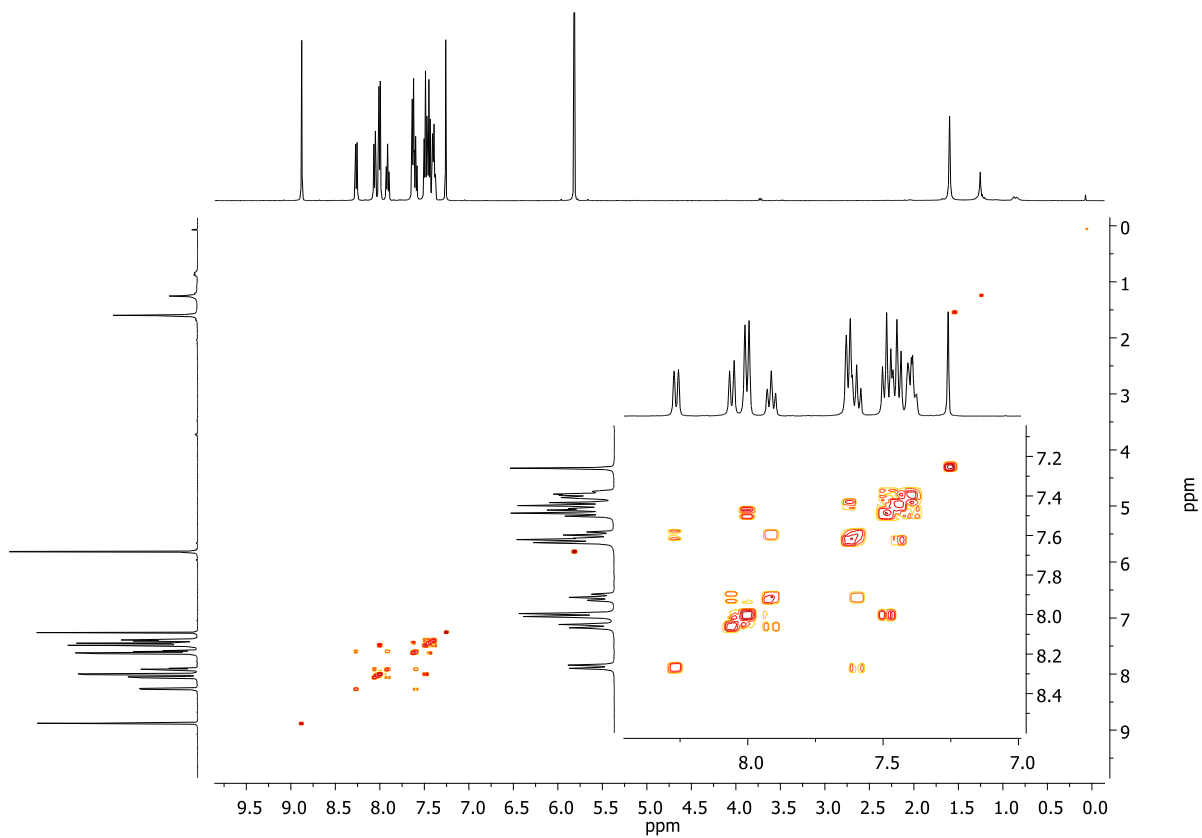
HSQC spectrum of compound 17b:



HMBC spectrum of compound 17b:



COSY spectrum of compound 17b:



## Azide-tetrazole equilibrium studies

**Table 1.** Amount of azide (A) and tetrazole (T) forms (%) of compound 4d in different solvents and temperatures (300 MHz, 3 sets of measurements with standard deviation  $\Delta s$ ).

		Solvent		CDCl <sub>3</sub>	DMSO-d <sub>6</sub>	Acetic acid-d <sub>4</sub>	Acetone-d <sub>6</sub>	CD <sub>3</sub> CN	THF-d <sub>8</sub>
		Dielectric constant $\epsilon^1$		4.8	46.7	6.1	20.7	37.5	7.6
		lg $\epsilon$		0.68	1.67	0.79	1.32	1.57	0.88
<b>T, °C</b>	<b>22</b>	<b>1</b>	T, %	72	94	51	86	91	77
			A, %	28	6	49	14	9	23
		<b>2</b>	T, %	75	94	50	84	90	77
			A, %	25	6	50	16	10	23
		<b>3</b>	T, %	75	94	51	83	90	75
			A, %	25	6	49	17	10	25
		<b>Average</b>	T, %	<b>74.0</b>	<b>94.0</b>	<b>50.7</b>	<b>84.3</b>	<b>90.3</b>	<b>76.3</b>
			A, %	<b>26.0</b>	<b>6.0</b>	<b>49.3</b>	<b>15.7</b>	<b>9.7</b>	<b>23.7</b>
	<b><math>\Delta s</math>, %</b>		1.73	0.00	0.58	1.53	0.58	1.15	
	<b>30</b>	<b>1</b>	T, %	69	93	49	84	89	74
			A, %	31	7	51	16	11	26
		<b>2</b>	T, %	72	93	50	82	89	74
			A, %	28	7	50	18	11	26
		<b>3</b>	T, %	71	93	50	80	89	72
			A, %	29	7	50	20	11	28
		<b>Average</b>	T, %	<b>70.7</b>	<b>93.0</b>	<b>49.7</b>	<b>82.0</b>	<b>89.0</b>	<b>73.3</b>
			A, %	<b>29.3</b>	<b>7.0</b>	<b>50.3</b>	<b>18.0</b>	<b>11.0</b>	<b>26.7</b>
	<b><math>\Delta s</math>, %</b>		1.53	0.00	0.58	2.00	0.00	1.15	
	<b>40</b>	<b>1</b>	T, %	65	92	47	80	87	70
			A, %	35	8	53	20	13	30
		<b>2</b>	T, %	66	91	47	79	87	69
			A, %	34	9	53	21	13	31
		<b>3</b>	T, %	69	91	48	77	87	68
			A, %	31	9	52	23	13	32
<b>Average</b>		T, %	<b>66.7</b>	<b>91.3</b>	<b>47.3</b>	<b>78.7</b>	<b>87.0</b>	<b>69.0</b>	
		A, %	<b>33.3</b>	<b>8.7</b>	<b>52.7</b>	<b>21.3</b>	<b>13.0</b>	<b>31.0</b>	
<b><math>\Delta s</math>, %</b>		2.08	0.58	0.58	1.53	0.00	1.00		

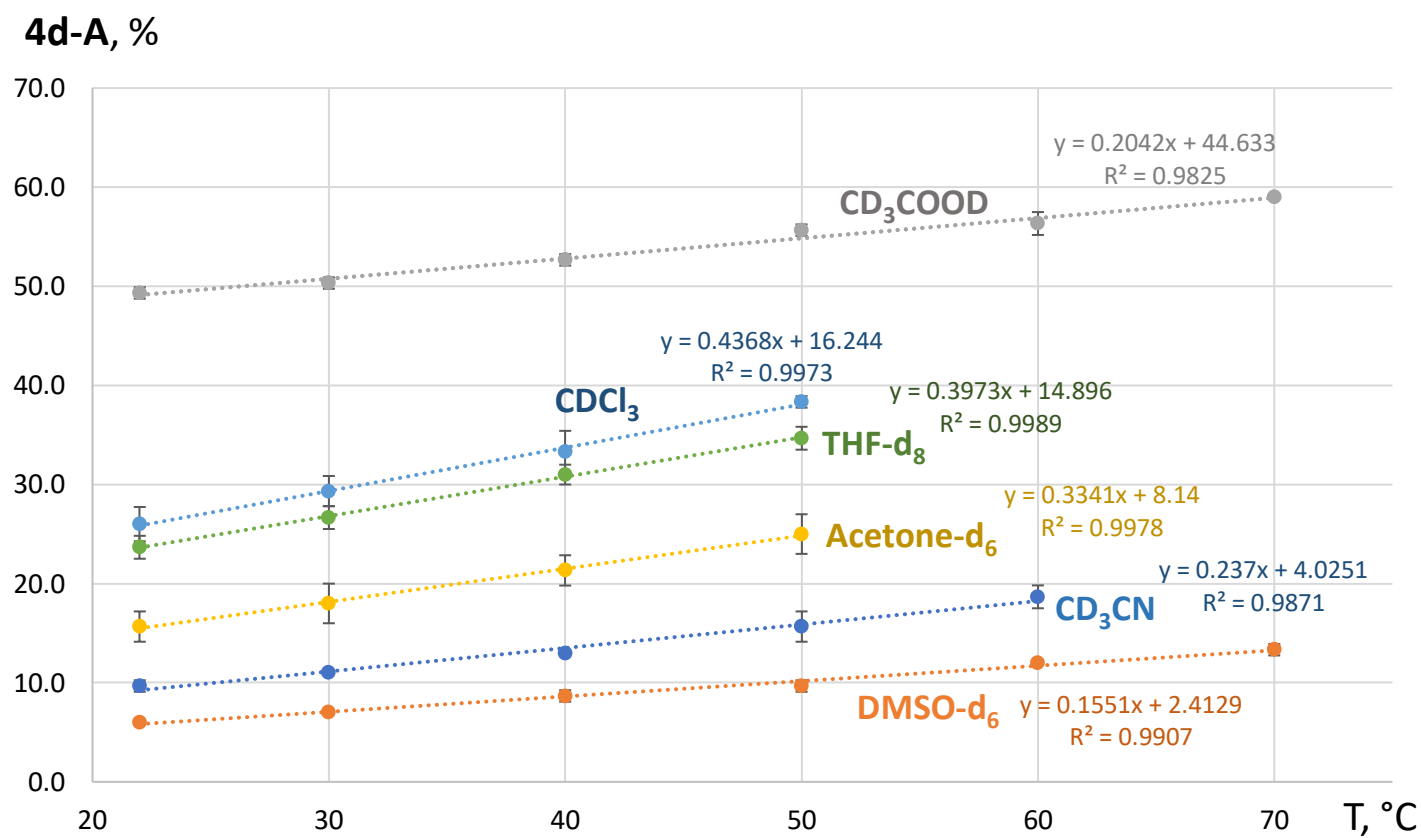
<sup>1</sup> O'Neil, M. J.; Heckelman, P. E.; Ko. The Merck Index: An Encyclopedia of Chemicals, Drugs, and Biologicals, 14th Edition. *J. Am. Chem. Soc.* **2007**, 129 (7), 2197–2197.

Table 1 (continued).

	Solvent		CDCl <sub>3</sub>	DMSO-d <sub>6</sub>	Acetic acid-d <sub>4</sub>	Acetone-d <sub>6</sub>	CD <sub>3</sub> CN	THF-d <sub>8</sub>	
	Dielectric constant $\epsilon^1$		4.8	46.7	6.1	20.7	37.5	7.6	
	lg $\epsilon$		0.68	1.67	0.79	1.32	1.57	0.88	
T, °C	50	1	T, %	61	90	44	77	84	66
			A, %	39	10	56	23	16	34
		2	T, %	62	91	45	75	86	66
			A, %	38	9	55	25	14	34
		3	T, %	62	90	44	73	83	64
			A, %	38	10	56	27	17	36
		Average	T, %	<b>61.7</b>	<b>90.3</b>	<b>44.3</b>	<b>75.0</b>	<b>84.3</b>	<b>65.3</b>
			A, %	<b>38.3</b>	<b>9.7</b>	<b>55.7</b>	<b>25.0</b>	<b>15.7</b>	<b>34.7</b>
	$\Delta s$ , %		0.58	0.58	0.58	2.00	1.53	1.15	
	60	1	T, %		88	43		82	
			A, %		12	57		18	
		2	T, %		88	43		80	
			A, %		12	57		20	
		3	T, %		88	45		82	
			A, %		12	55		18	
		Average	T, %		<b>88</b>	<b>43.67</b>		<b>81.33</b>	
			A, %		<b>12</b>	<b>56.33</b>		<b>18.67</b>	
	$\Delta s$ , %			0	1.154701		1.154701		
	70	1	T, %		86	41			
			A, %		14	59			
		2	T, %		87	41			
A, %				13	59				
3		T, %		87	41				
		A, %		13	59				
Average		T, %		<b>86.67</b>	<b>41.00</b>				
		A, %		<b>13.33</b>	<b>59.00</b>				
$\Delta s$			0.57735	0.00					

<sup>1</sup> O'Neil, M. J.; Heckelman, P. E.; Ko. The Merck Index: An Encyclopedia of Chemicals, Drugs, and Biologicals, 14th Edition. *J. Am. Chem. Soc.* **2007**, 129 (7), 2197–2197.

Azide form tautomeric ratio (%) of compound 4d depending on temperature in different solvents (Table 1)

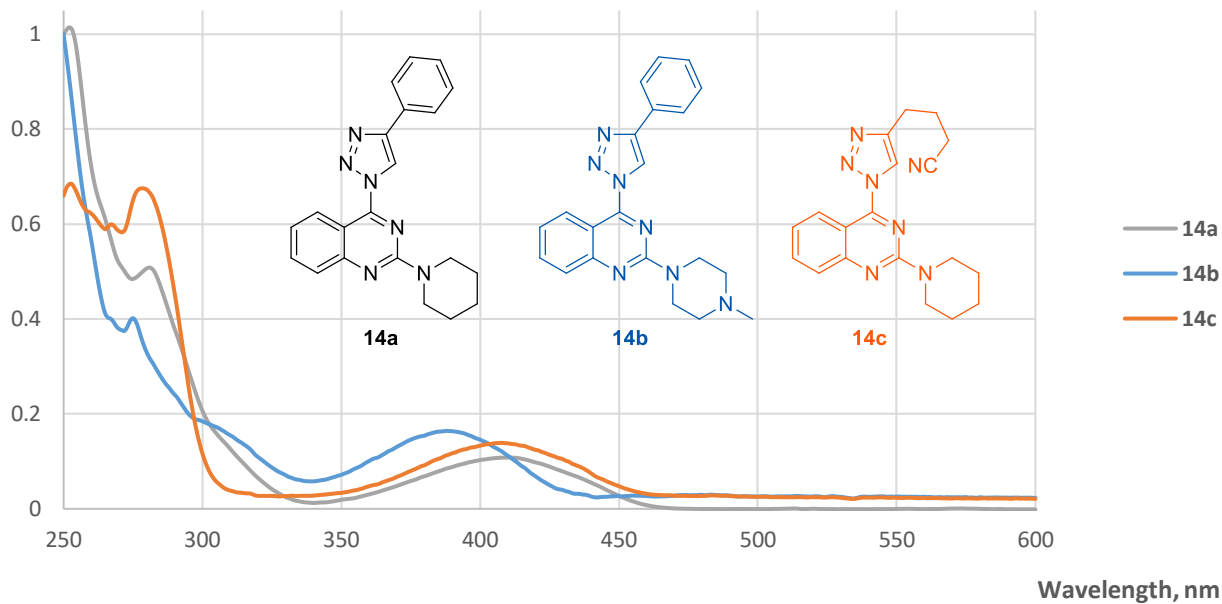




## UV/Vis absorption and emission spectra

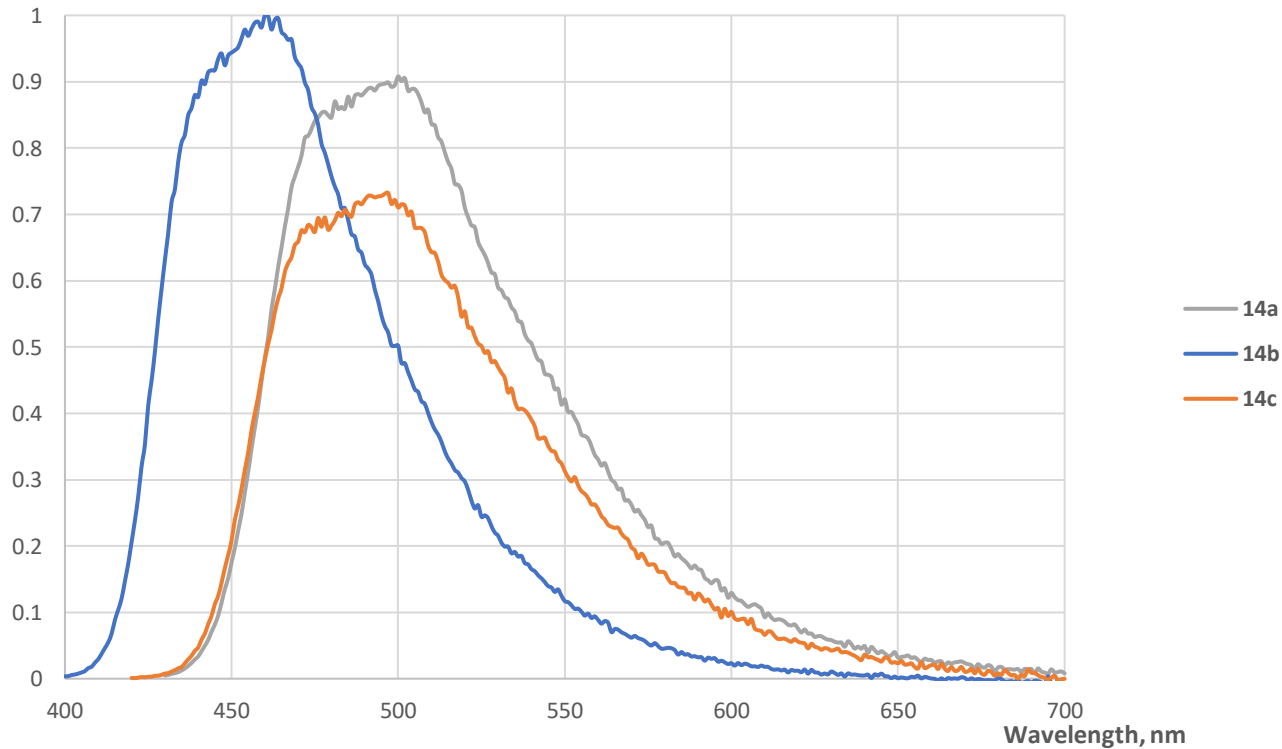
Absorption spectra of 4-triazolylquinazoline derivatives **14** ( $c = 10^{-5}$  M; solvent – DCM):

Absorbance, A

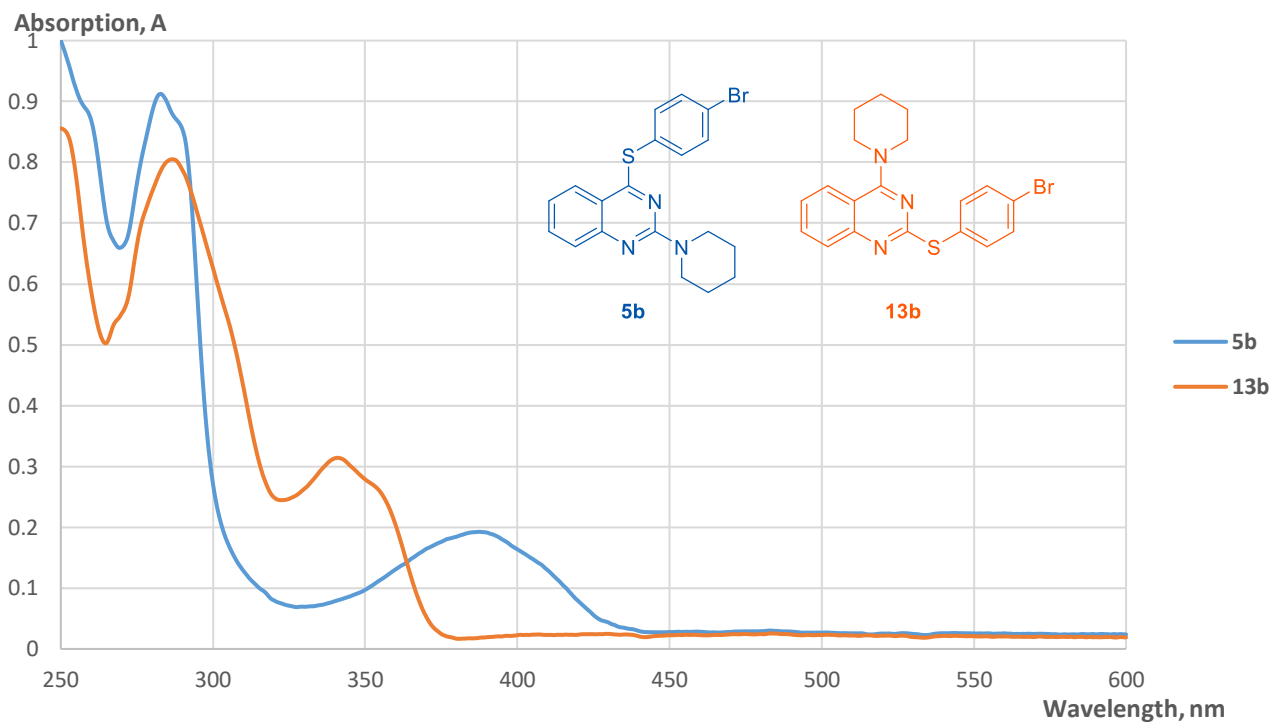


Emission spectra of 4-triazolylquinazoline derivatives **14a** ( $\lambda_{\text{exc}} = 405$  nm), **14b** ( $\lambda_{\text{exc}} = 380$  nm) and **14c** ( $\lambda_{\text{exc}} = 400$  nm) ( $c = 10^{-5}$  M; solvent – DCM):

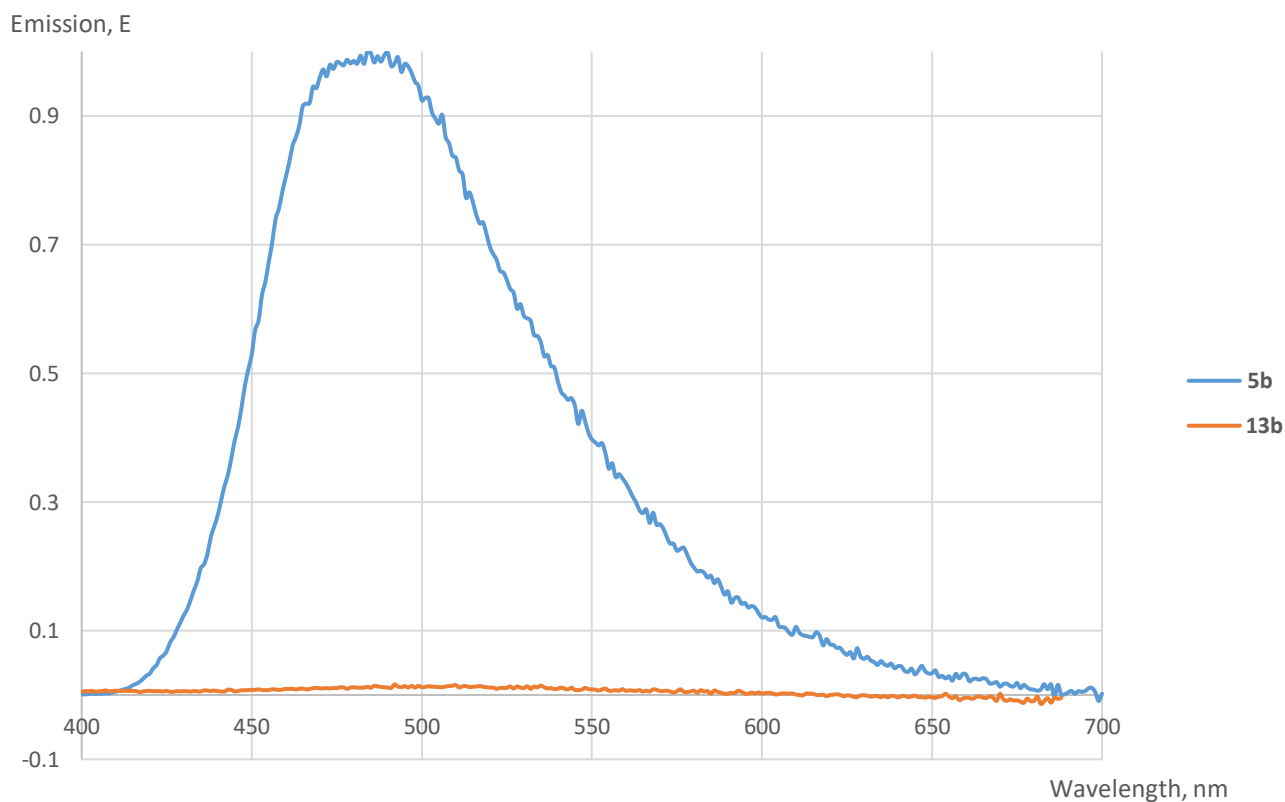
Emission, E



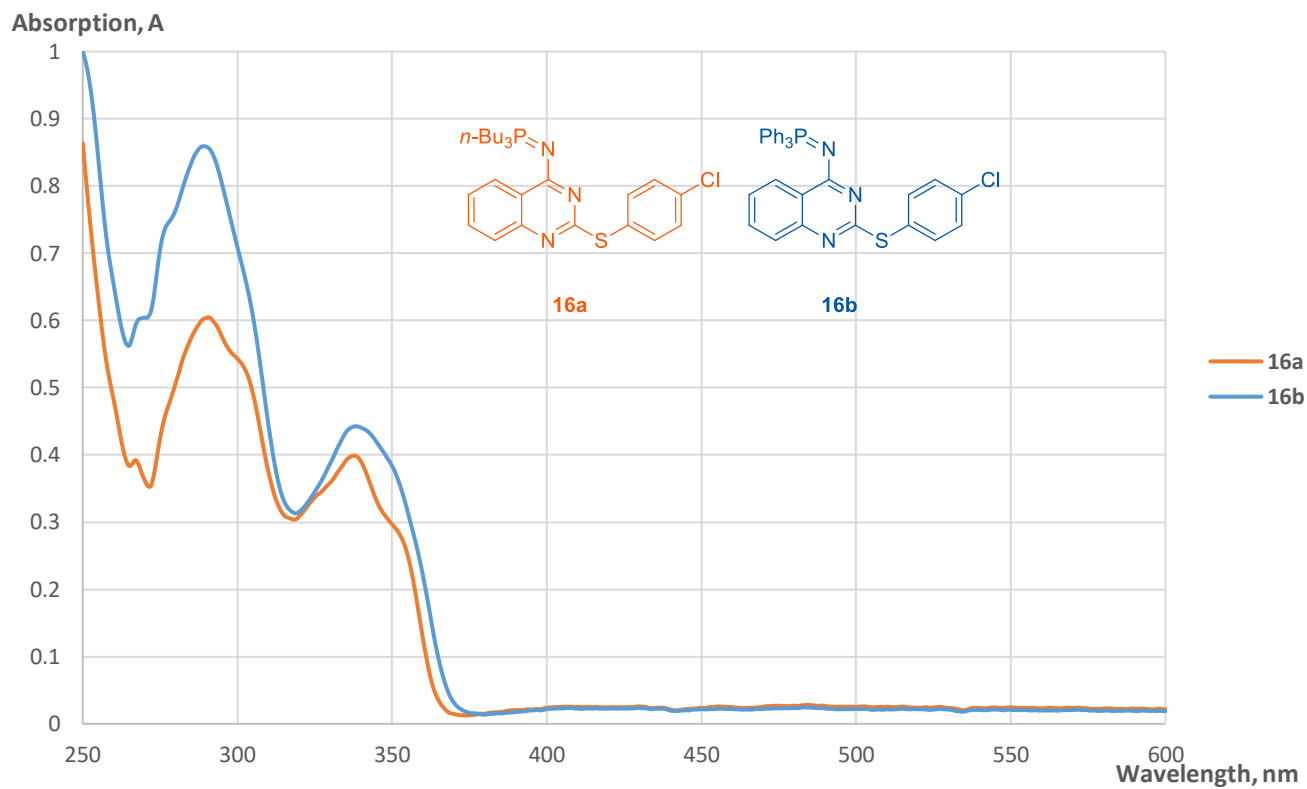
Absorption spectra of amino-arylthioquinazoline regioisomers **5b** and **13b** ( $c = 8 \times 10^{-6}$  M; solvent – DCM):



Emission spectra of amino-arylthioquinazoline regioisomers **5b** ( $\lambda_{exc} = 380$  nm) and **13b** ( $\lambda_{exc} = 320$  nm) ( $c = 8 \times 10^{-6}$  M; solvent – DCM):



**Absorption spectra of quinazoline iminophosphoranes 16a and 16b ( $c = 9 \times 10^{-6}$  M; solvent – DCM):**



**Emission spectra of quinazoline iminophosphoranes 16a and 16b ( $\lambda_{exc} = 320$  nm) ( $c = 9 \times 10^{-6}$  M; solvent – DCM):**

