

Supplementary Materials: Investigation of the Pyridinium Ylide-Alkyne Cycloaddition as Fluorogenic Coupling Reaction

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Supplementary material

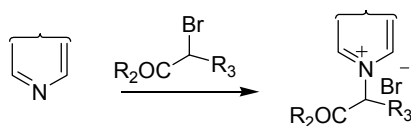
Synthesis:

Table 1. Preparation of the heterocyclic salt precursor.

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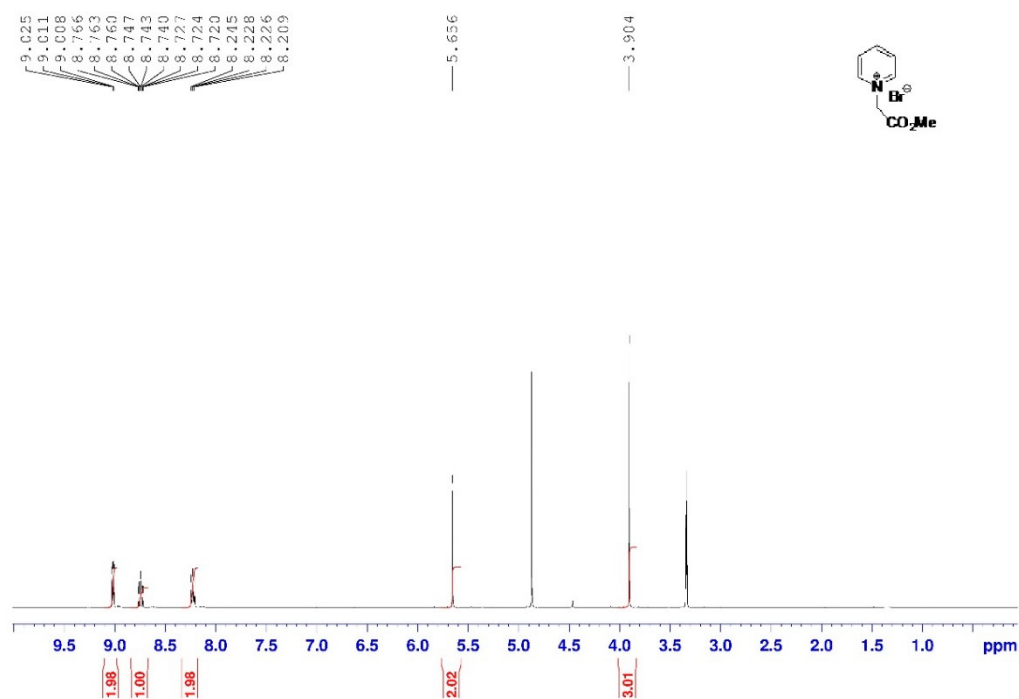
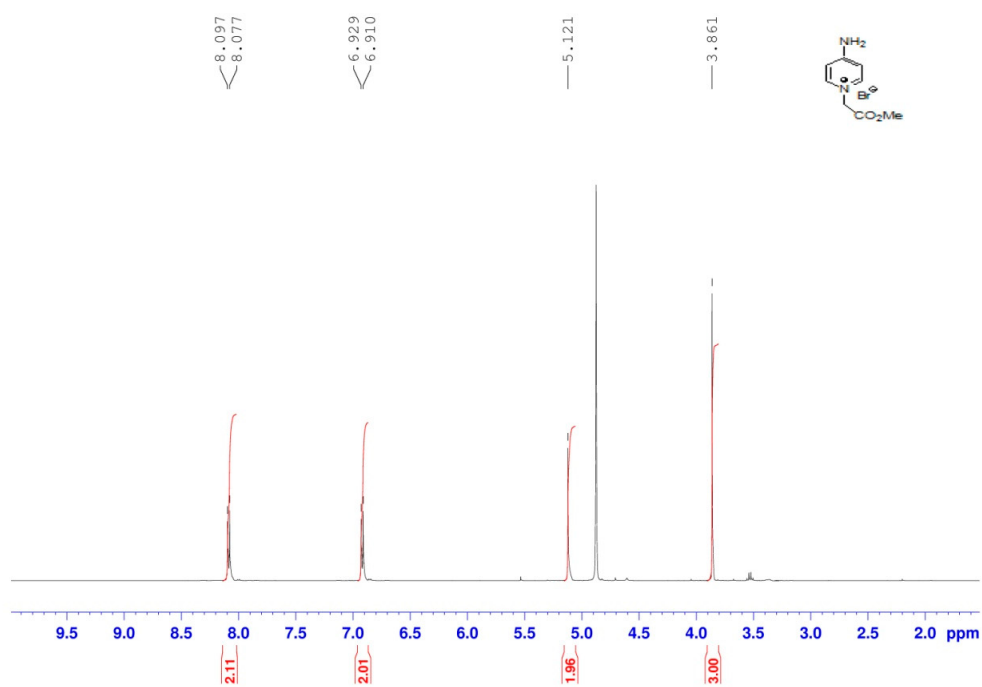
NMR and HPLC Chromatograms:

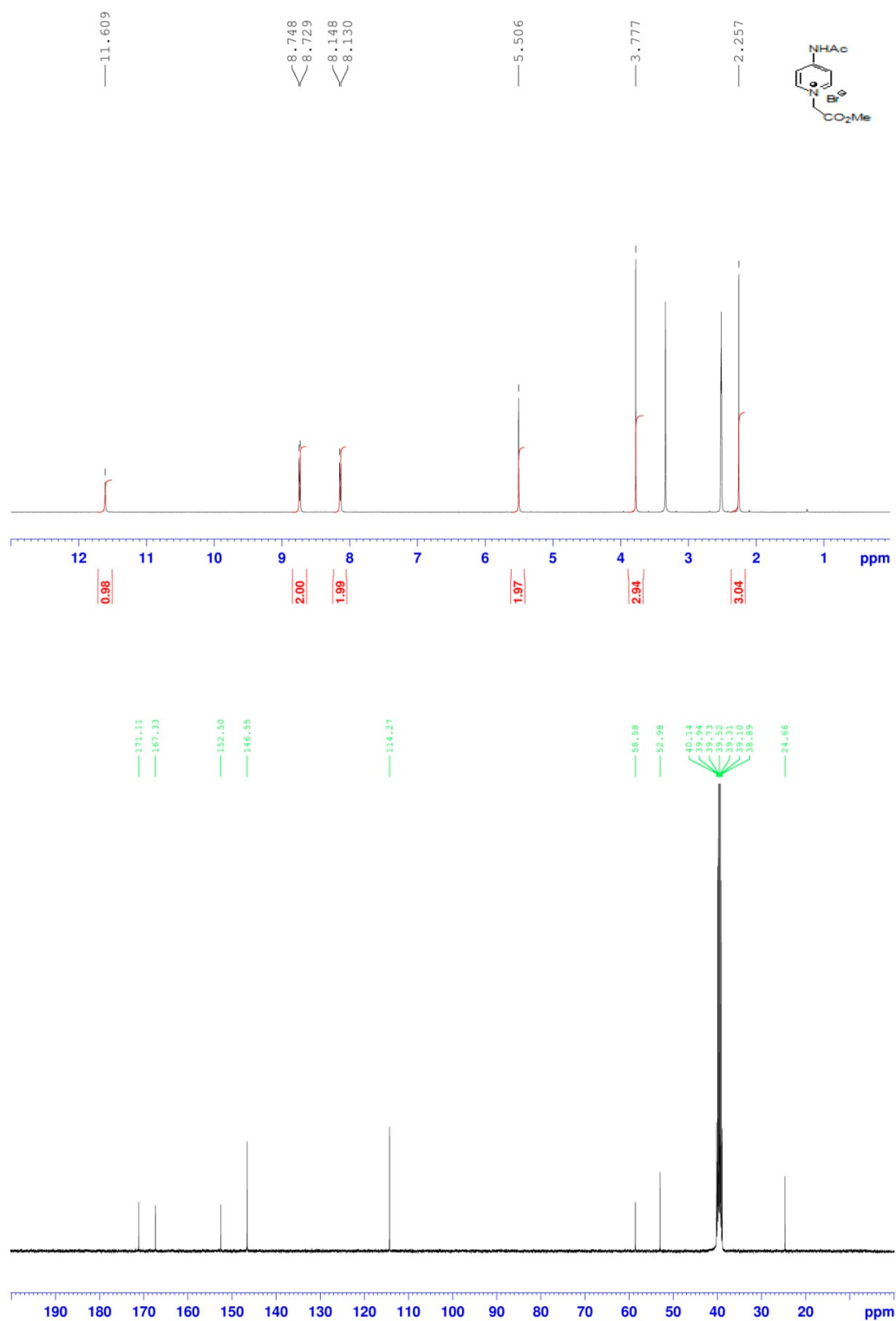
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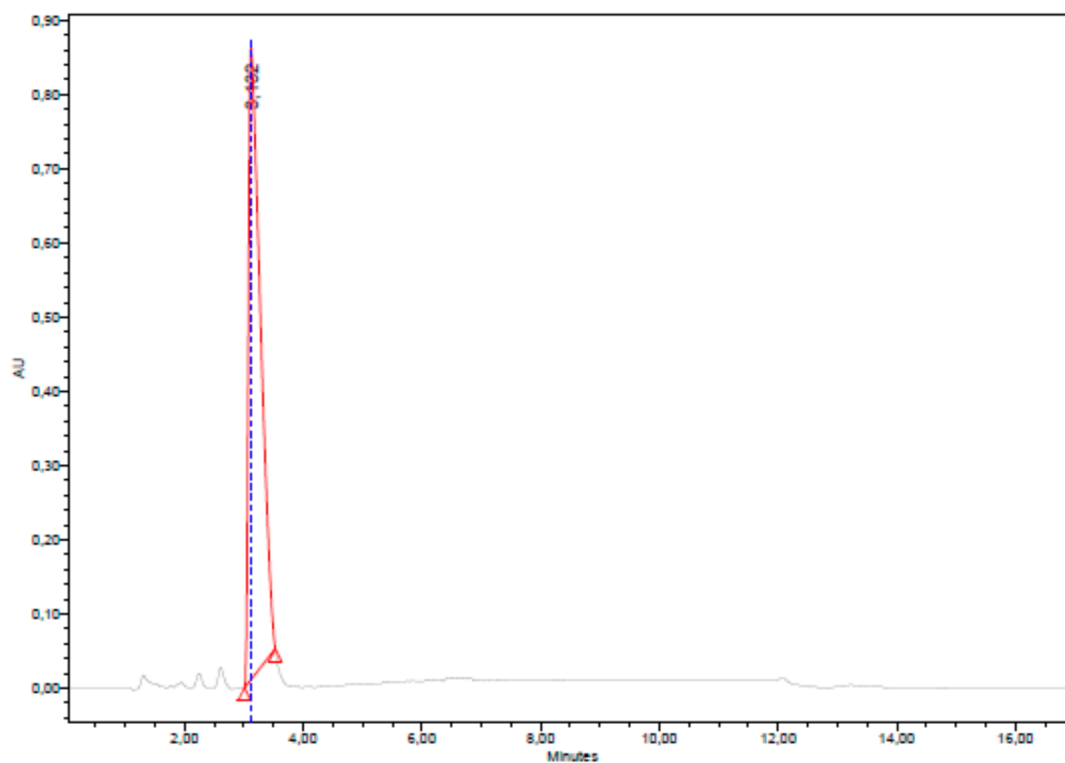
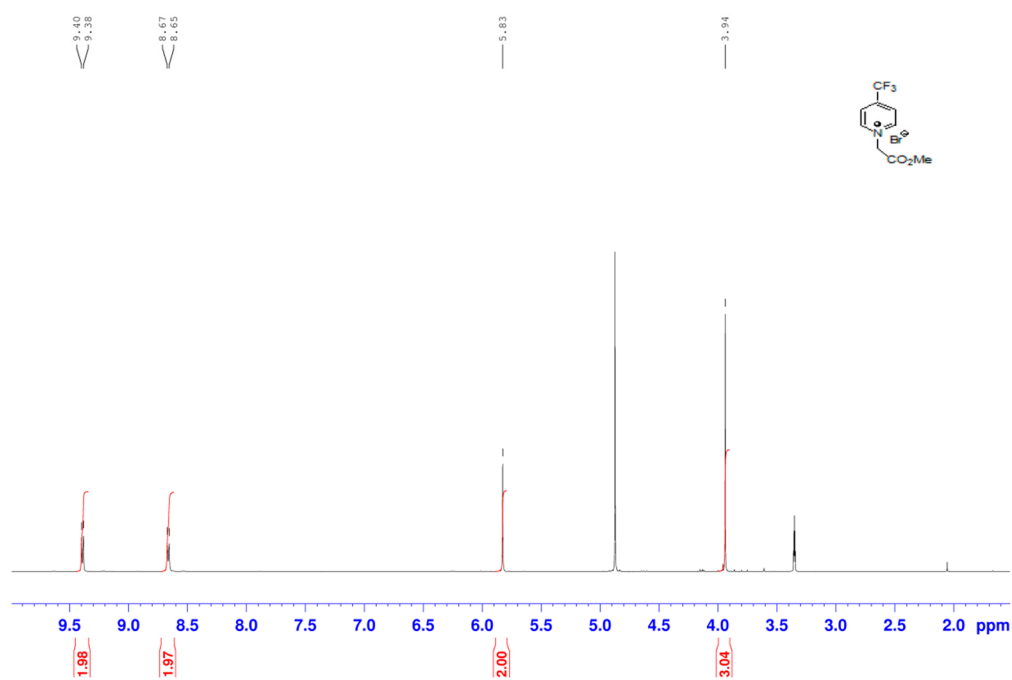
Table S1. Preparation of pyridinium salts and analogs.

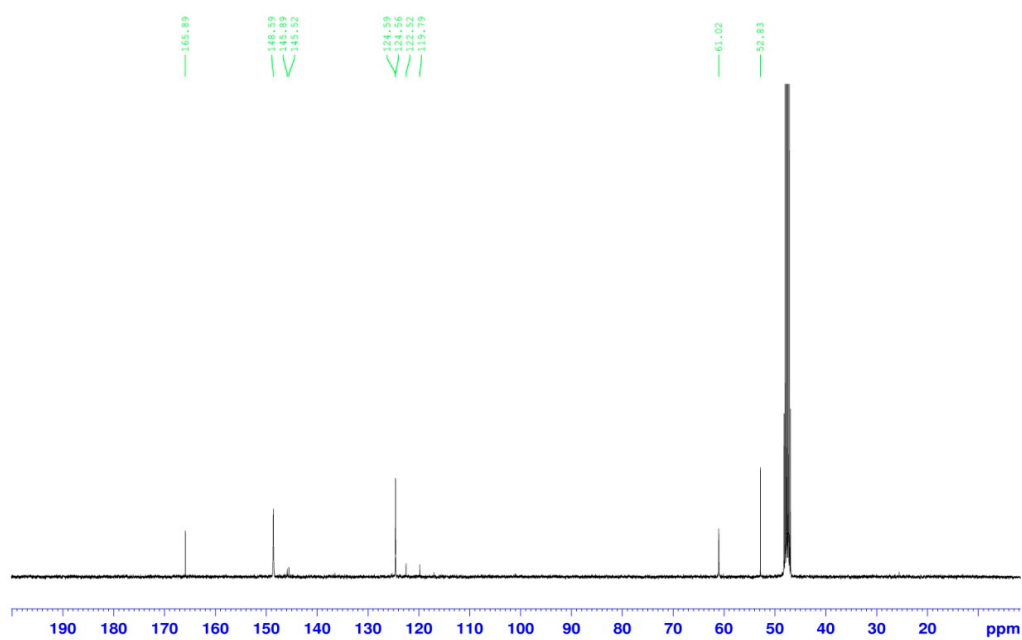
Starting Material	Acylating Agent	Method	Pyridinium Salt	Yield (%)
pyridine	BrCH ₂ CO ₂ Me	A	1	71
4-aminopyridine	BrCH ₂ CO ₂ Me	A	2	83
4-N-acetylamino pyridine	BrCH ₂ CO ₂ Me	A	3	81
4-trifluoromethyl pyridine	BrCH ₂ CO ₂ Me	A	4	54
4-propylcarbamoyl pyridine	BrCH ₂ CO ₂ Me	A	5	80
4-acetylpyridine	BrCH ₂ CO ₂ Me	A	6	64
4-cyanopyridine	BrCH ₂ CO ₂ Me	A	7	60
4-cyanopyridine	BrCH ₂ COPh	A	8	70
4-cyanopyridine	BrCH ₂ COPhNO ₂	A	9	60
4-cyanopyridine	ClCH ₂ CONHC ₃ H ₇	A	10	60
pyridine	BrCH(CO ₂ CH ₂ CH ₃) ₂	B	11	89
4-acetylpyridine	BrCH(CO ₂ CH ₂ CH ₃) ₂	B	12	99
4-cyanopyridine	BrCH(CO ₂ CH ₂ CH ₃) ₂	B	13	40

Method A: the alkylation was performed under ultrasound irradiation (3–5 h) in acetone, using 1.5 eq. of alkylating agent. The final temperature of the bath was kept below 50 °C; Method B: the reactions were performed at rt using diethyl 2-iodomalonate in large excess in acetone

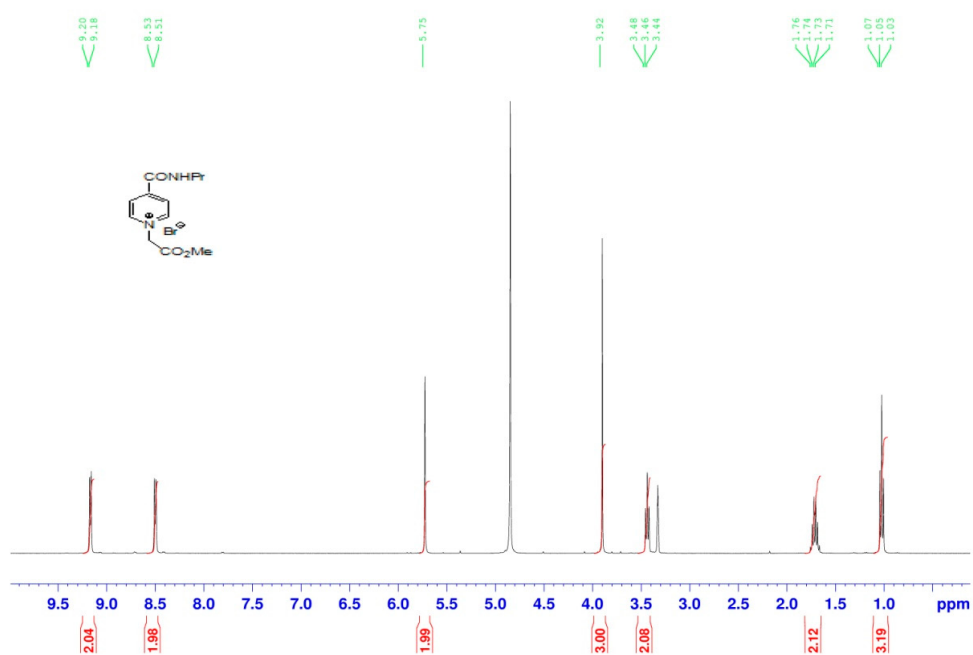
1-(2-Methoxy-2-oxoethyl)pyridinium bromide (1):**4-Amino-1-(2-methoxy-2-oxoethyl)pyridinium bromide (2)**

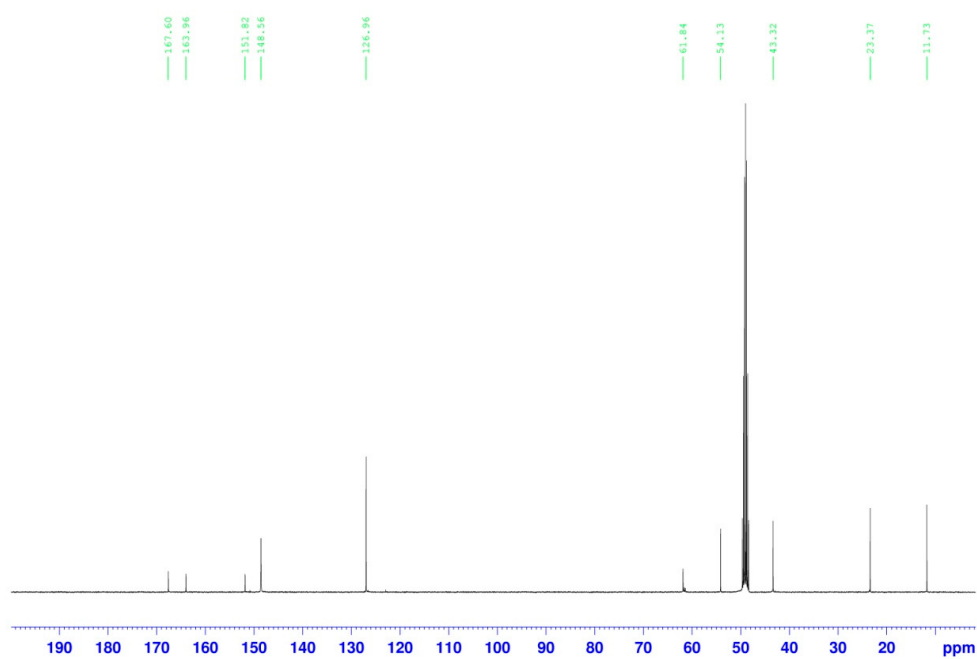
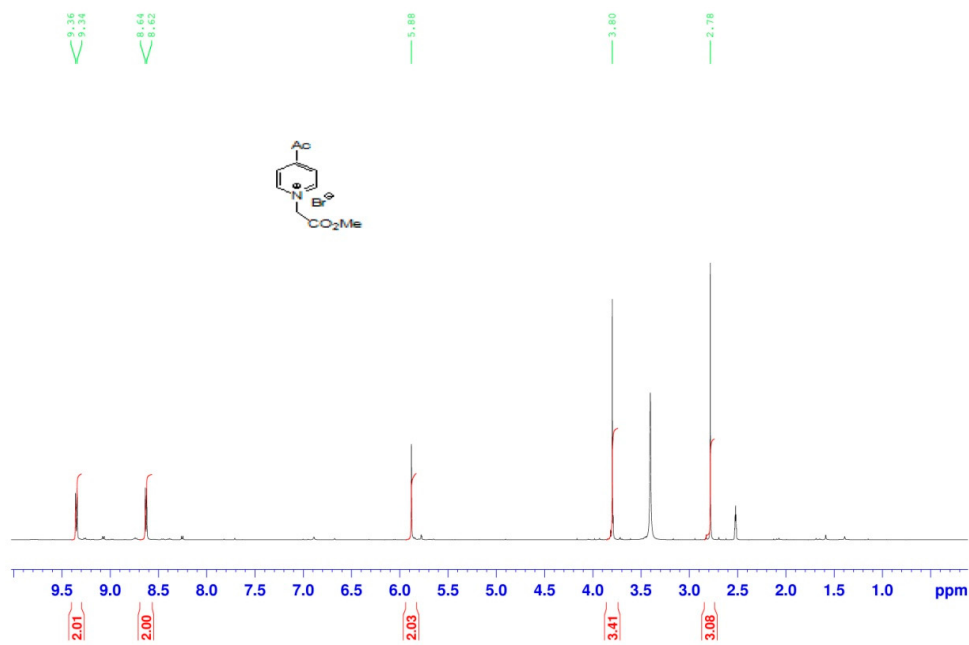
4-Acetamido-1-(2-methoxy-2-oxoethyl)pyridinium bromide (3)

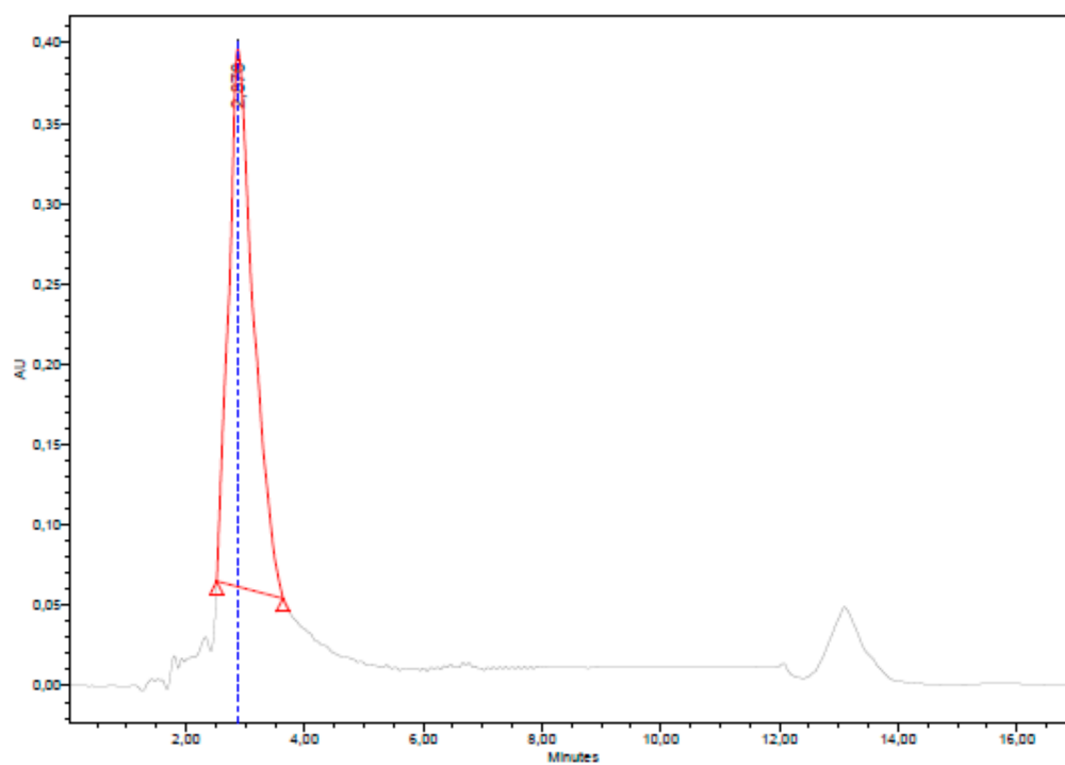
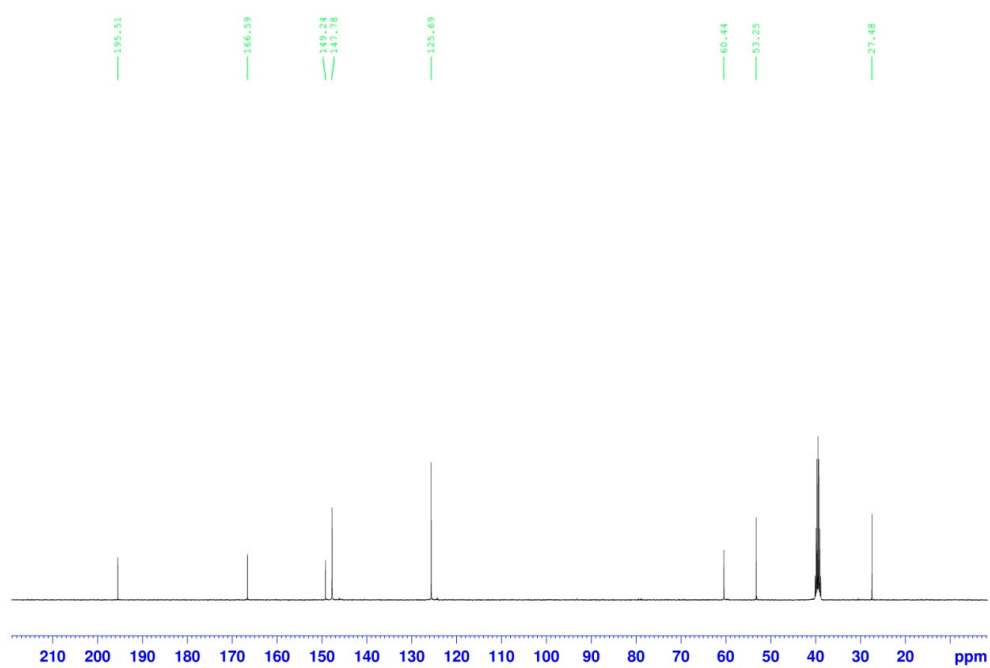
**4-Trifluoromethyl-1-(2-methoxy-2-oxoethyl)pyridinium bromide (4)**

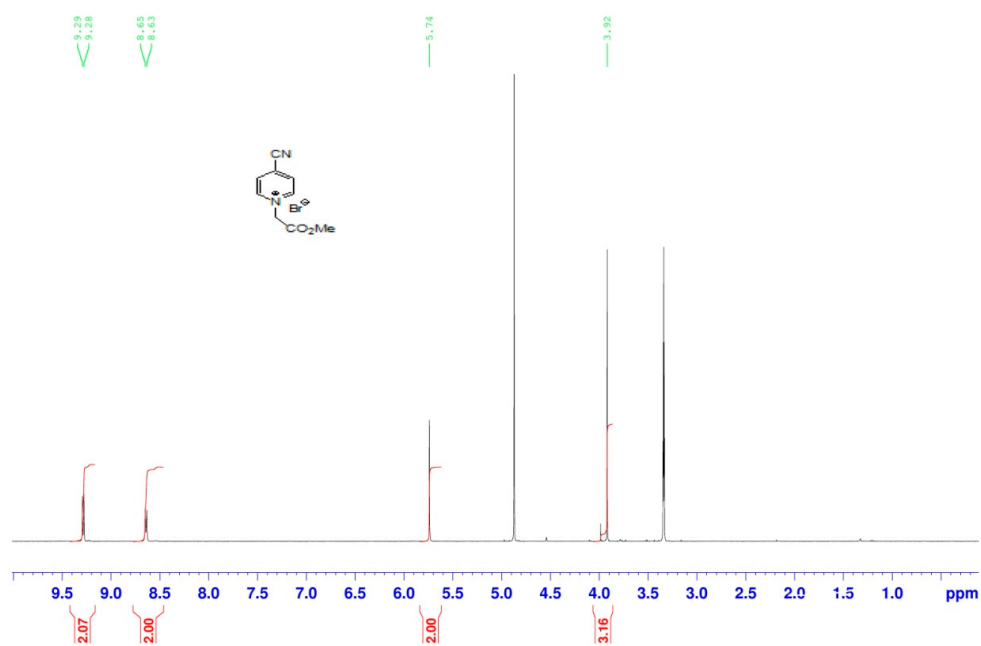
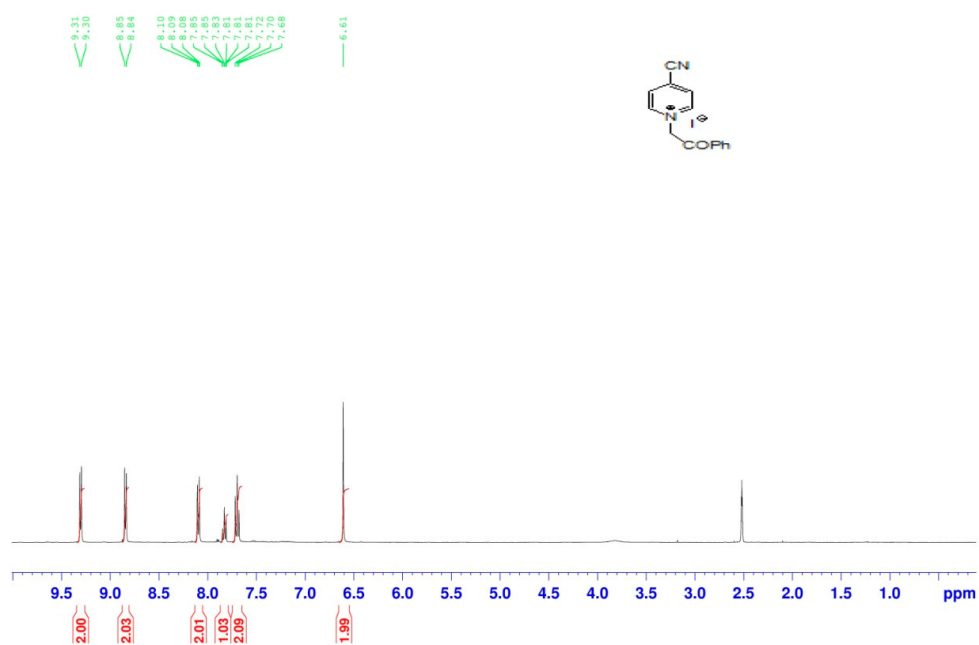


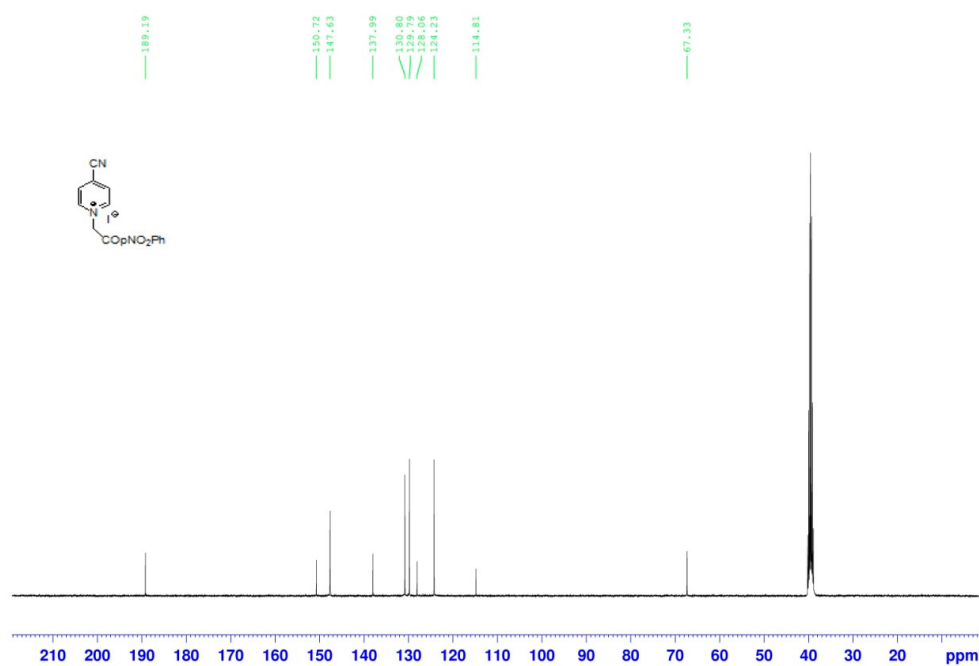
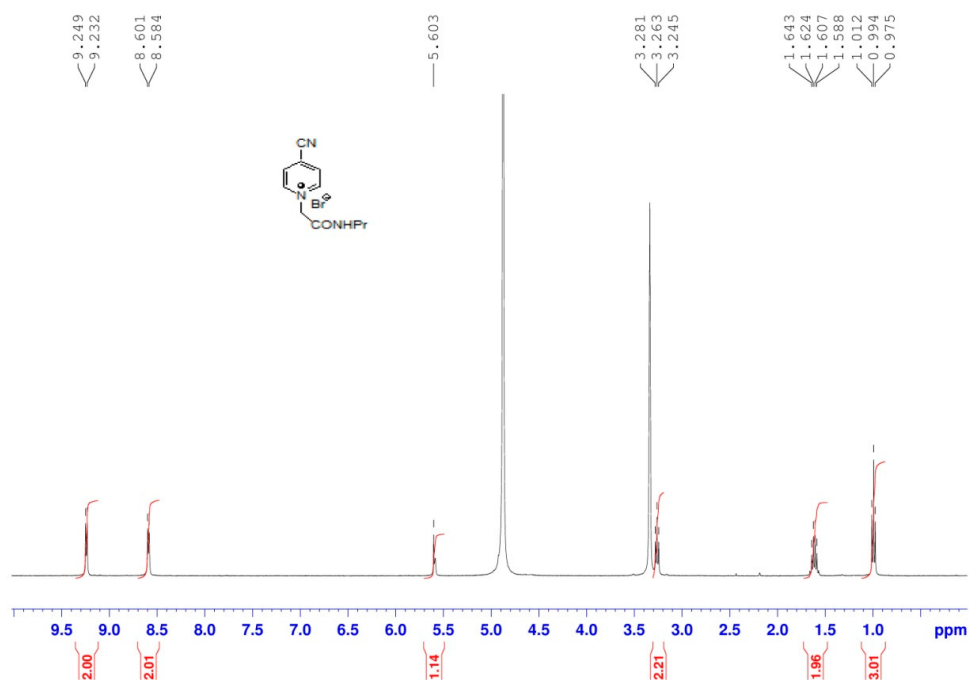
4-(N-Propylcarbamoyl)-1-(2-methoxy-2-oxoethyl)pyridinium bromide (5)

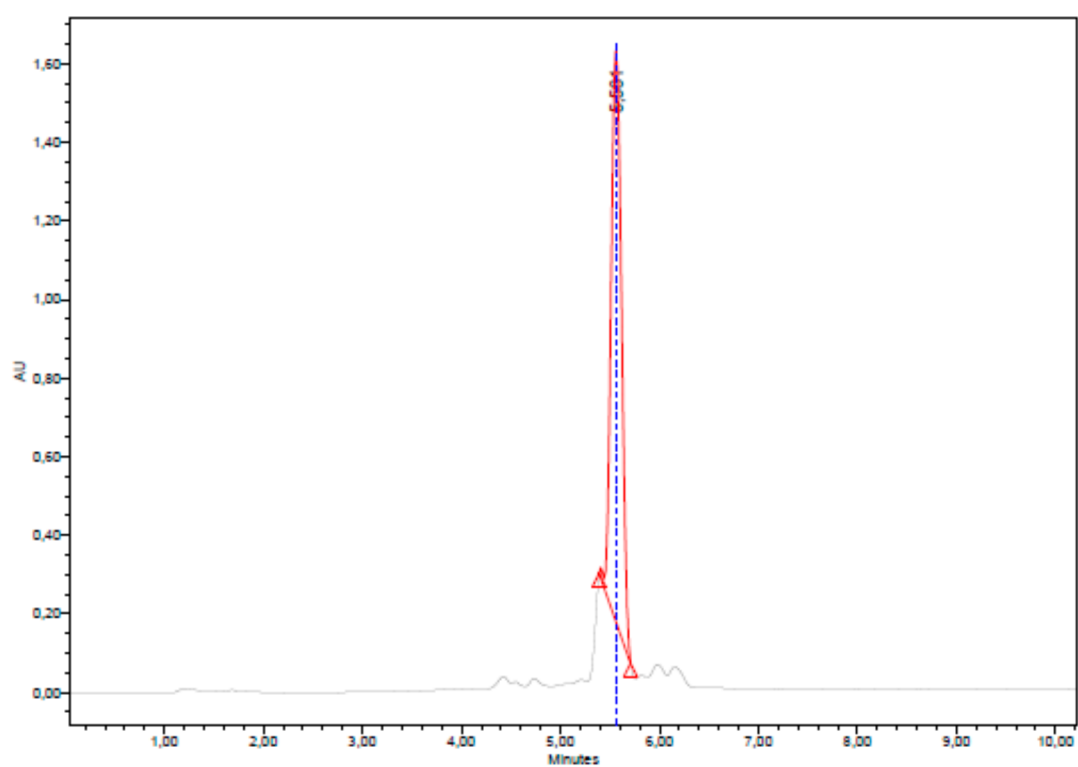
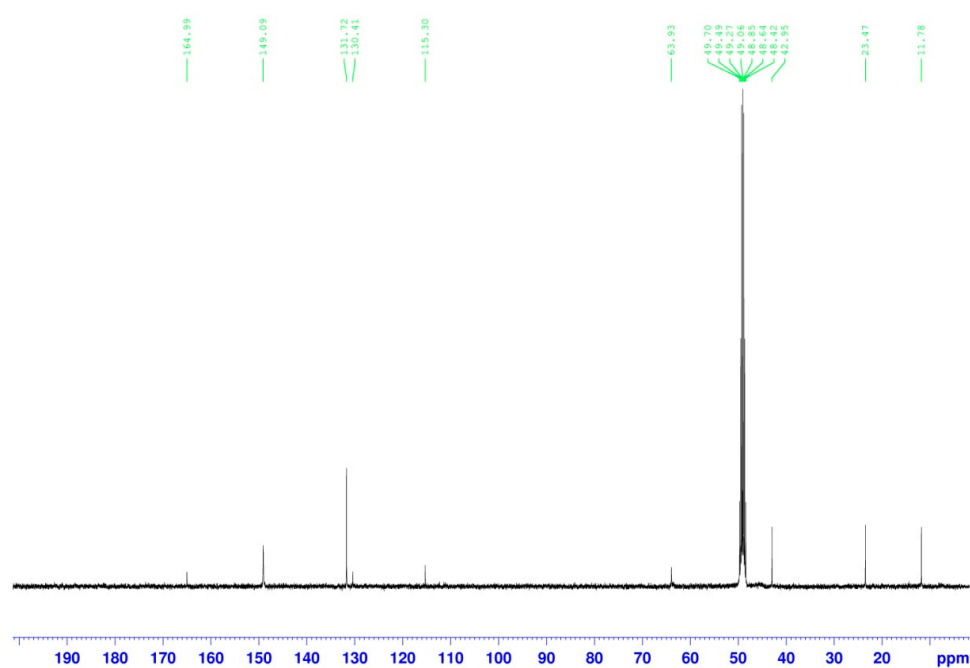


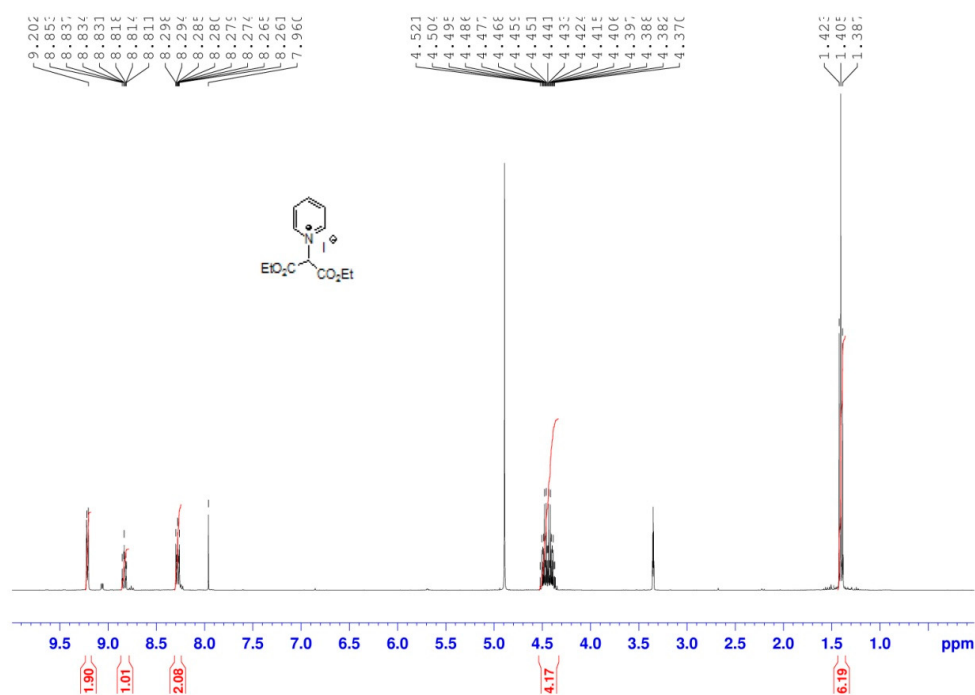
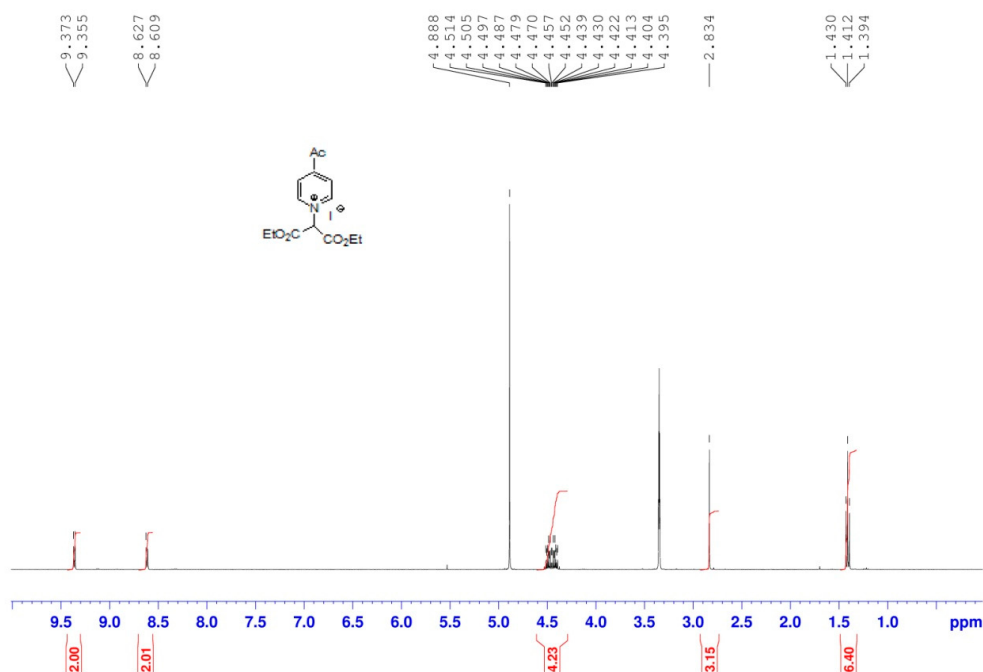
**4-Acetyl-1-(2-methoxy-2-oxoethyl)pyridinium bromide (6)**



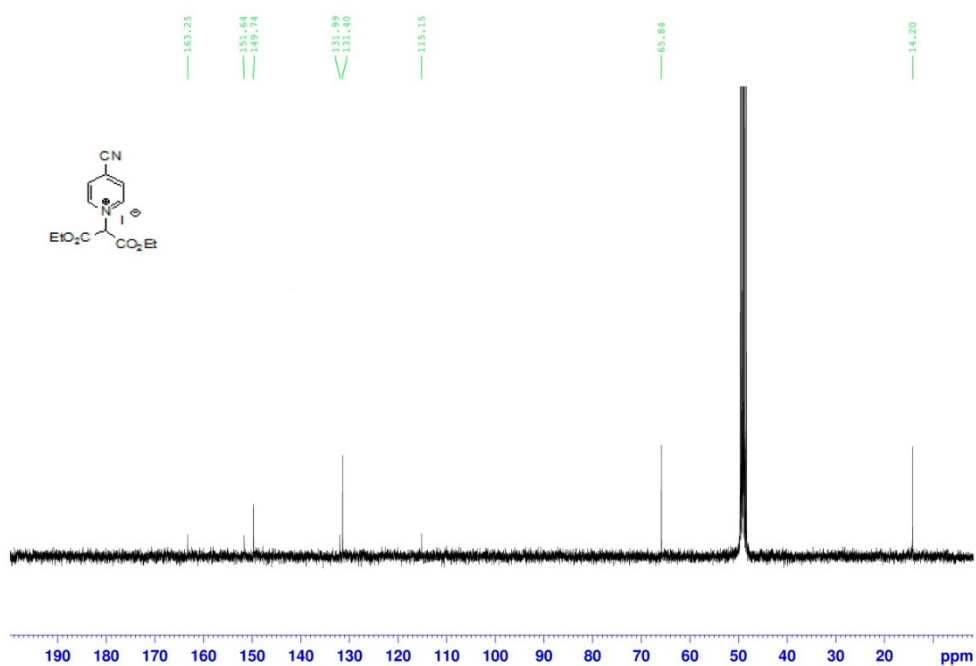
4-Cyano-1-(2-methoxy-2-oxoethyl)pyridinium bromide (7)**4-Cyano-1-(2-oxo-2-phenylethyl)pyridinium iodide (8)**

4-Cyano-1-(2-oxo-2-(para-nitrophenyl)ethyl)pyridinium iodide (9)**4-Cyano-1-[(N-propylcarbamoyl)methyl]pyridinium bromide (10)**

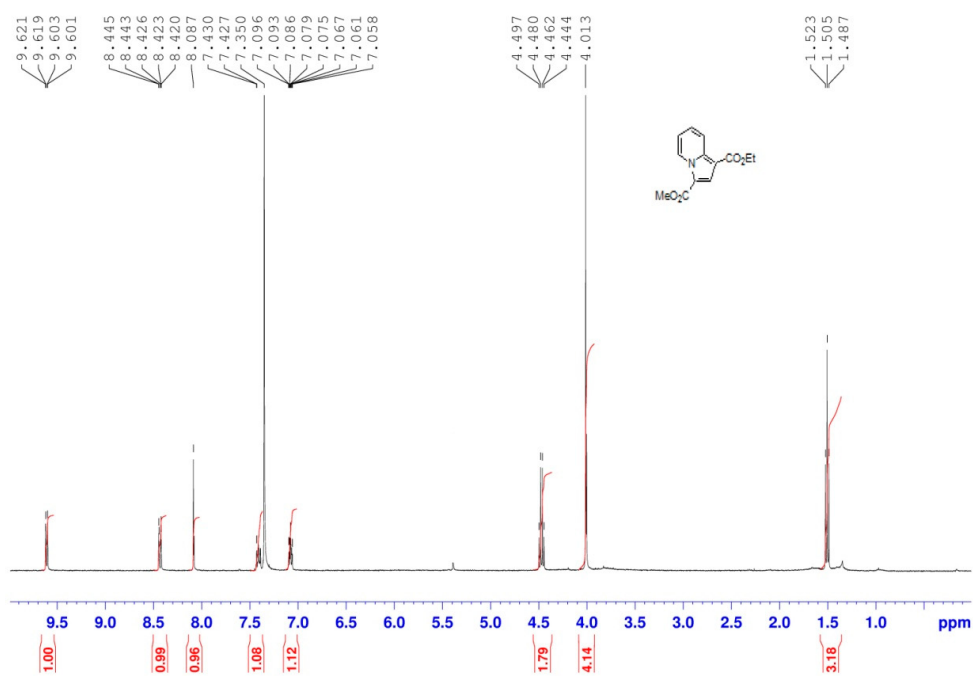


1-(1,3-Diethoxy-1,3-dioxopropan-2-yl)pyridinium iodide (11)**4-Acetyl-1-(1,3-diethoxy-1,3-dioxopropan-2-yl)pyridinium iodide (12)**

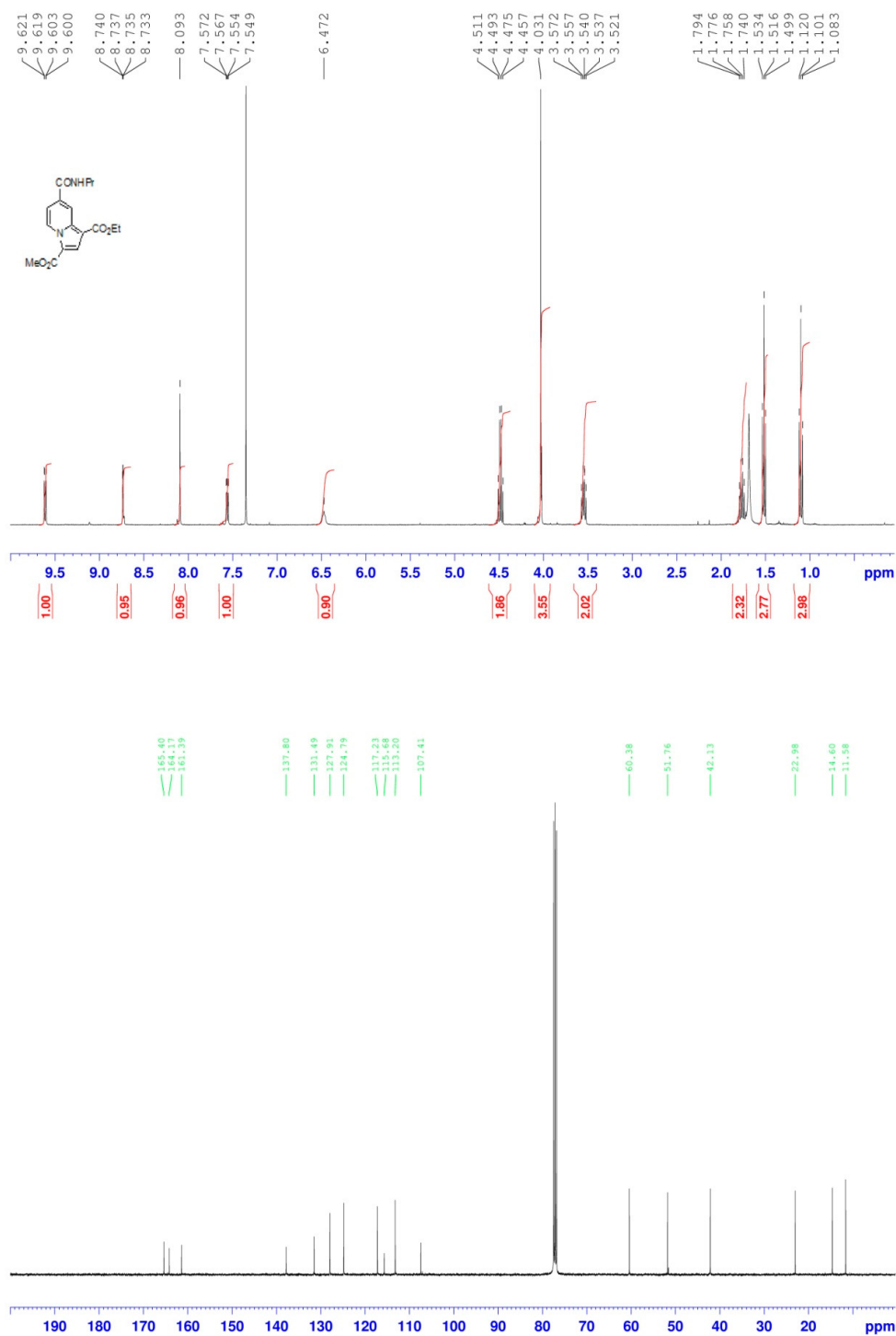
4-Cyano-1-(1,3-diethoxy-1,3-dioxopropan-2-yl)pyridinium iodide (13)

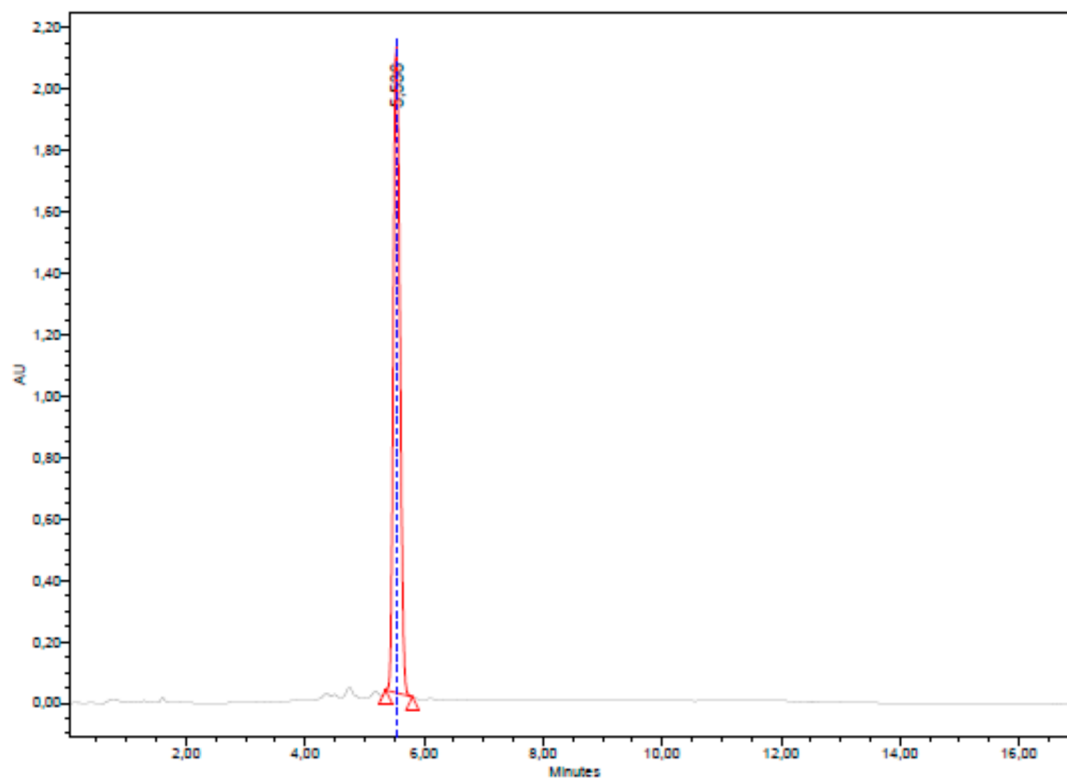
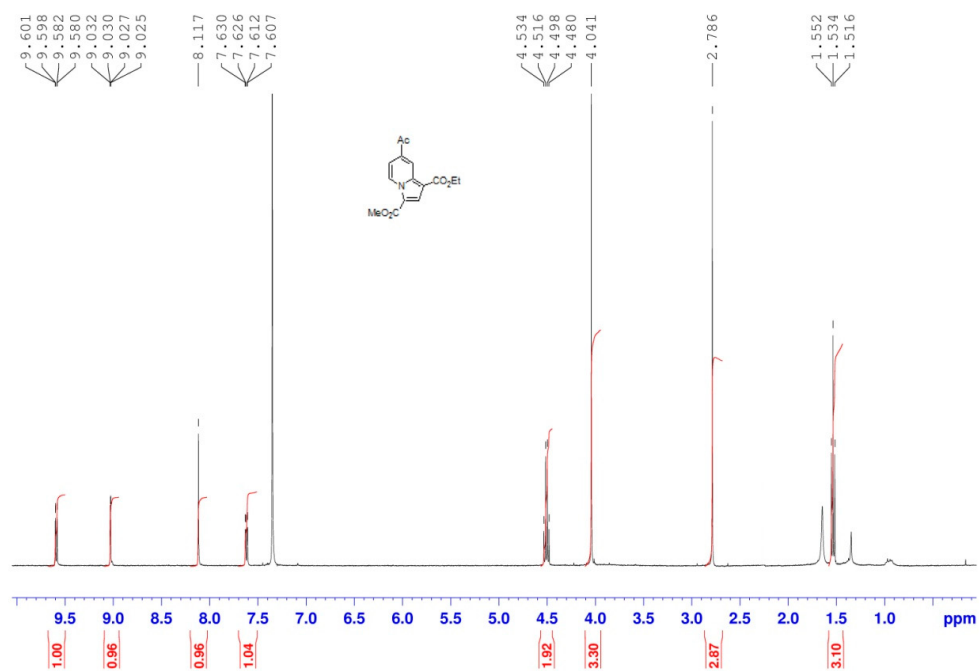


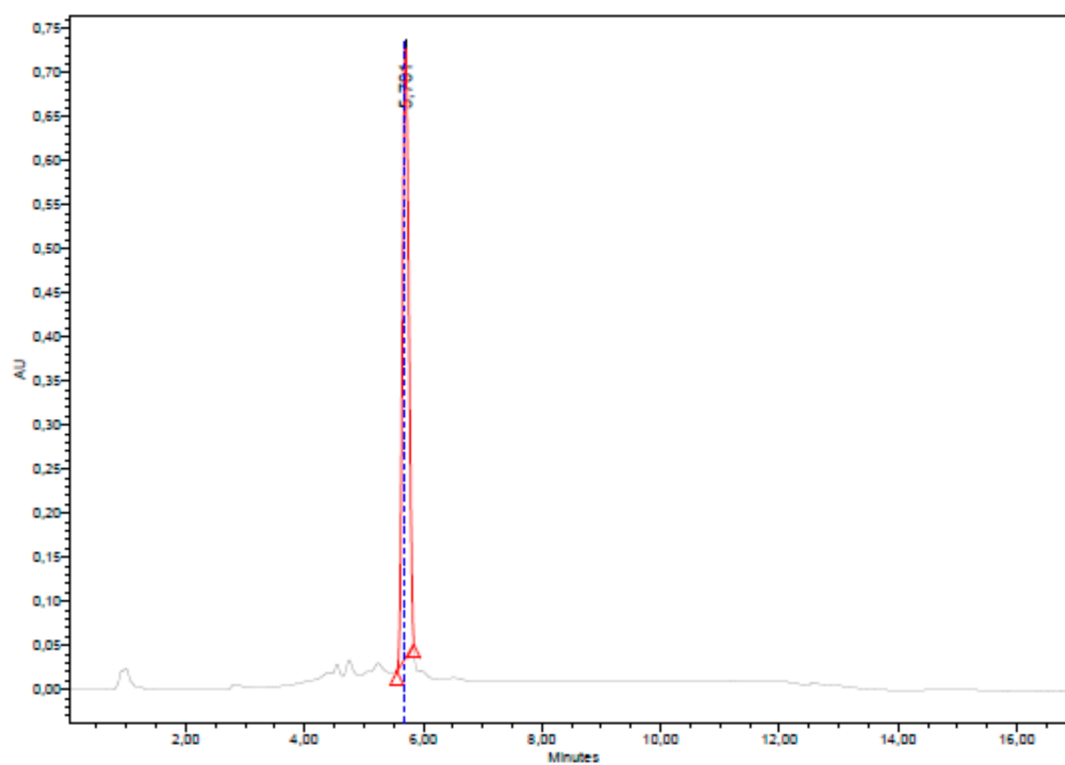
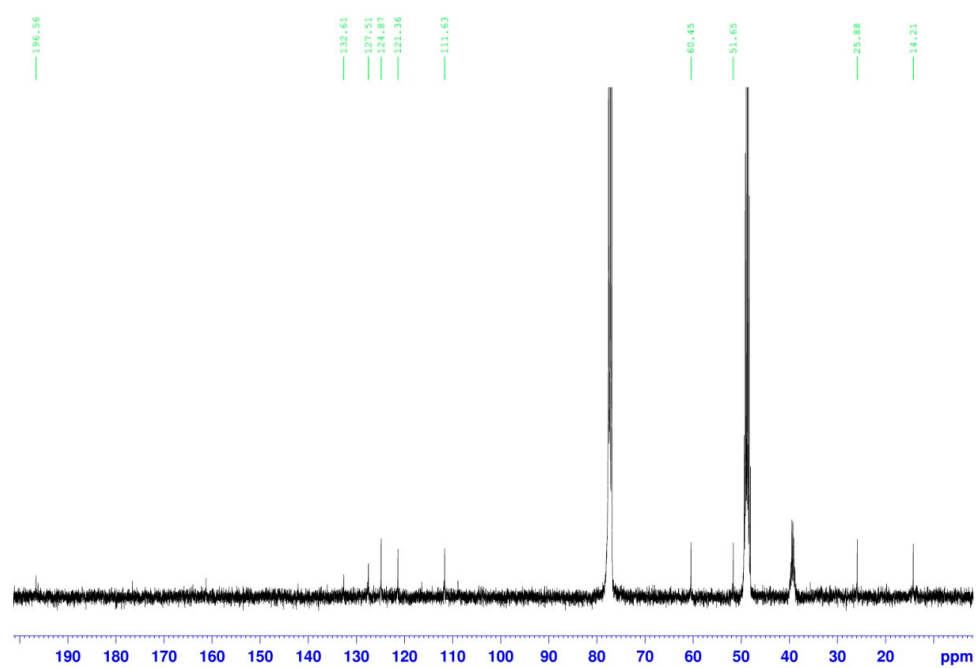
1-Ethyl 3-methyl indolizine-1,3-dicarboxylate (14)

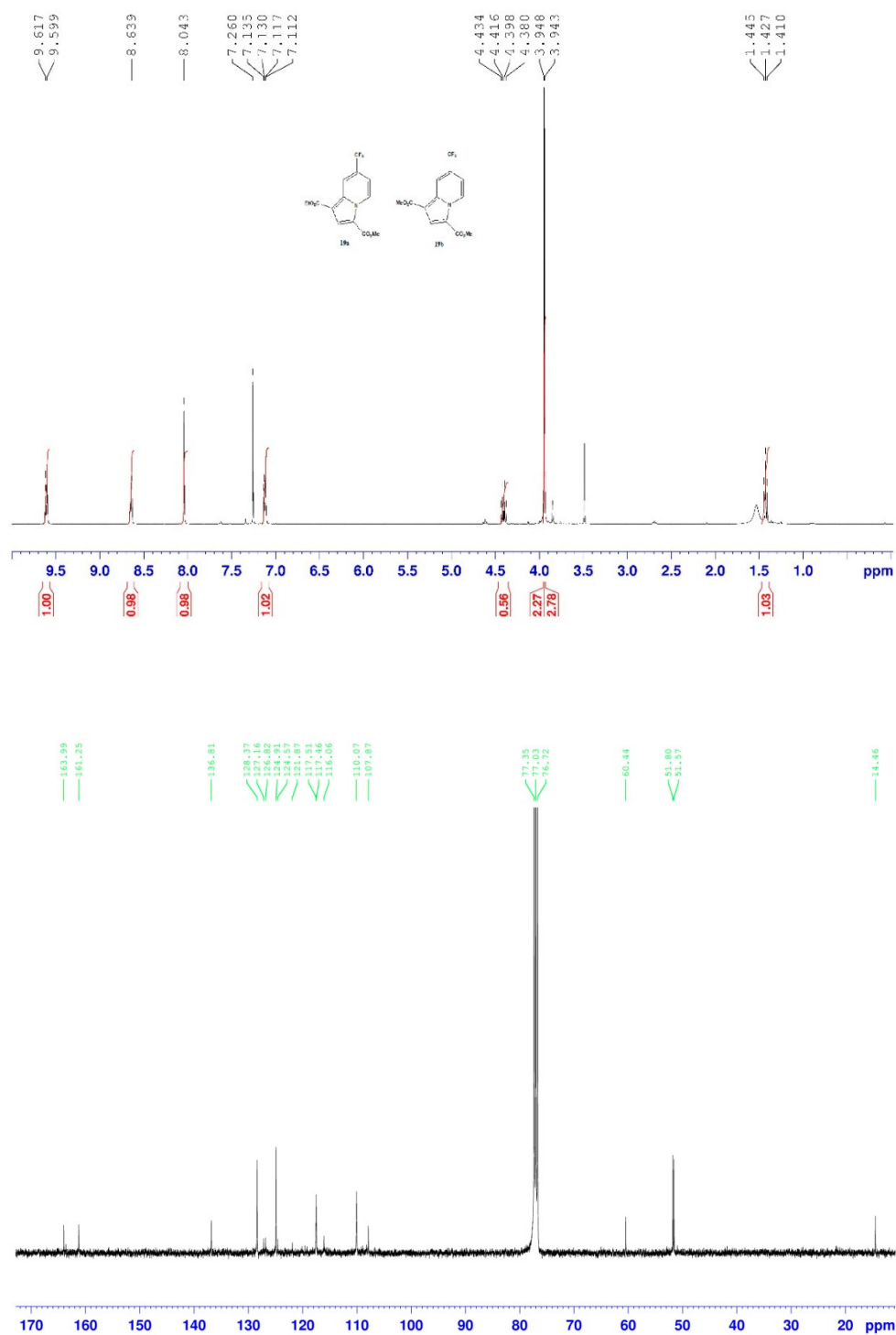


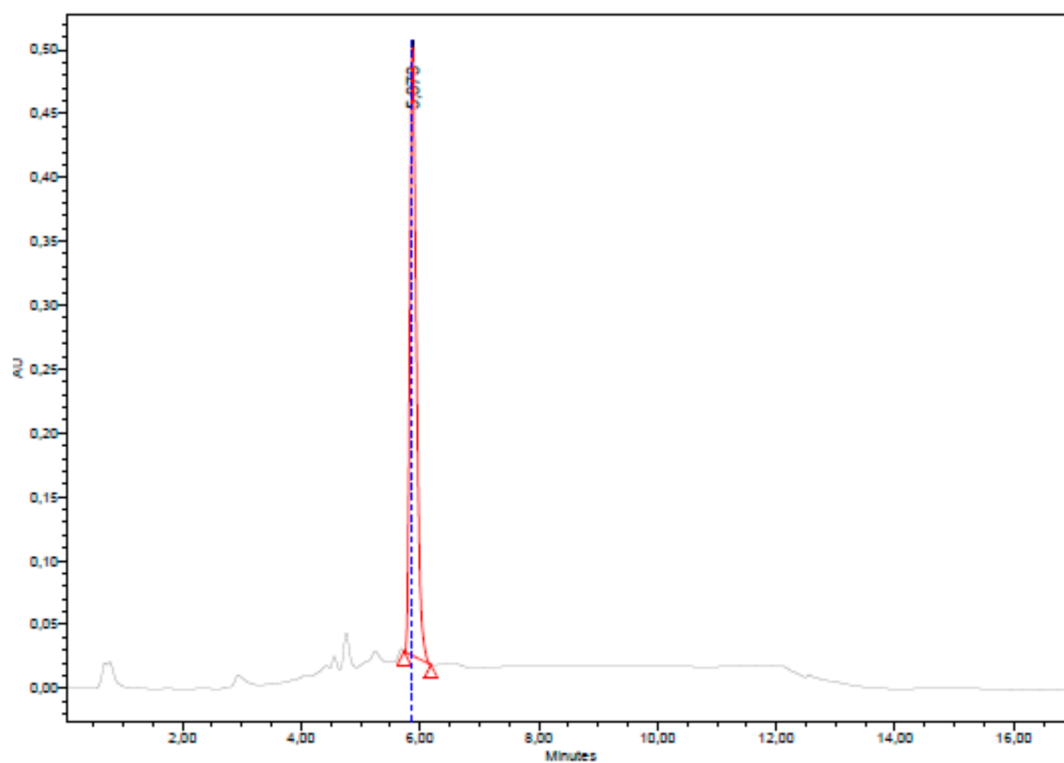
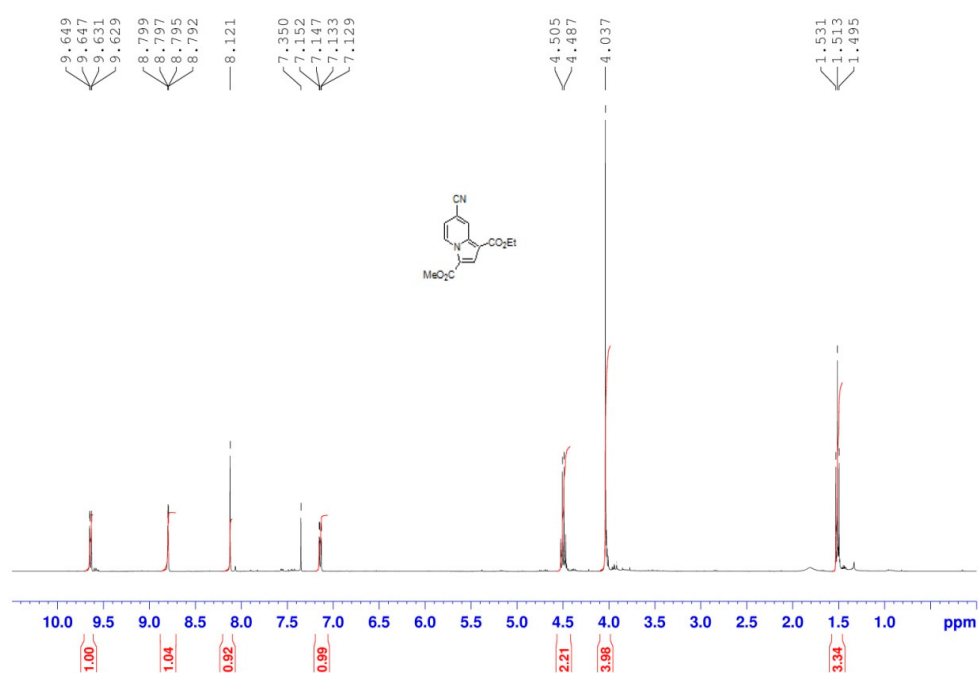
1-Ethyl 3-methyl 7-(propylcarbamoyl)indolizine-1,3-dicarboxylate (17)

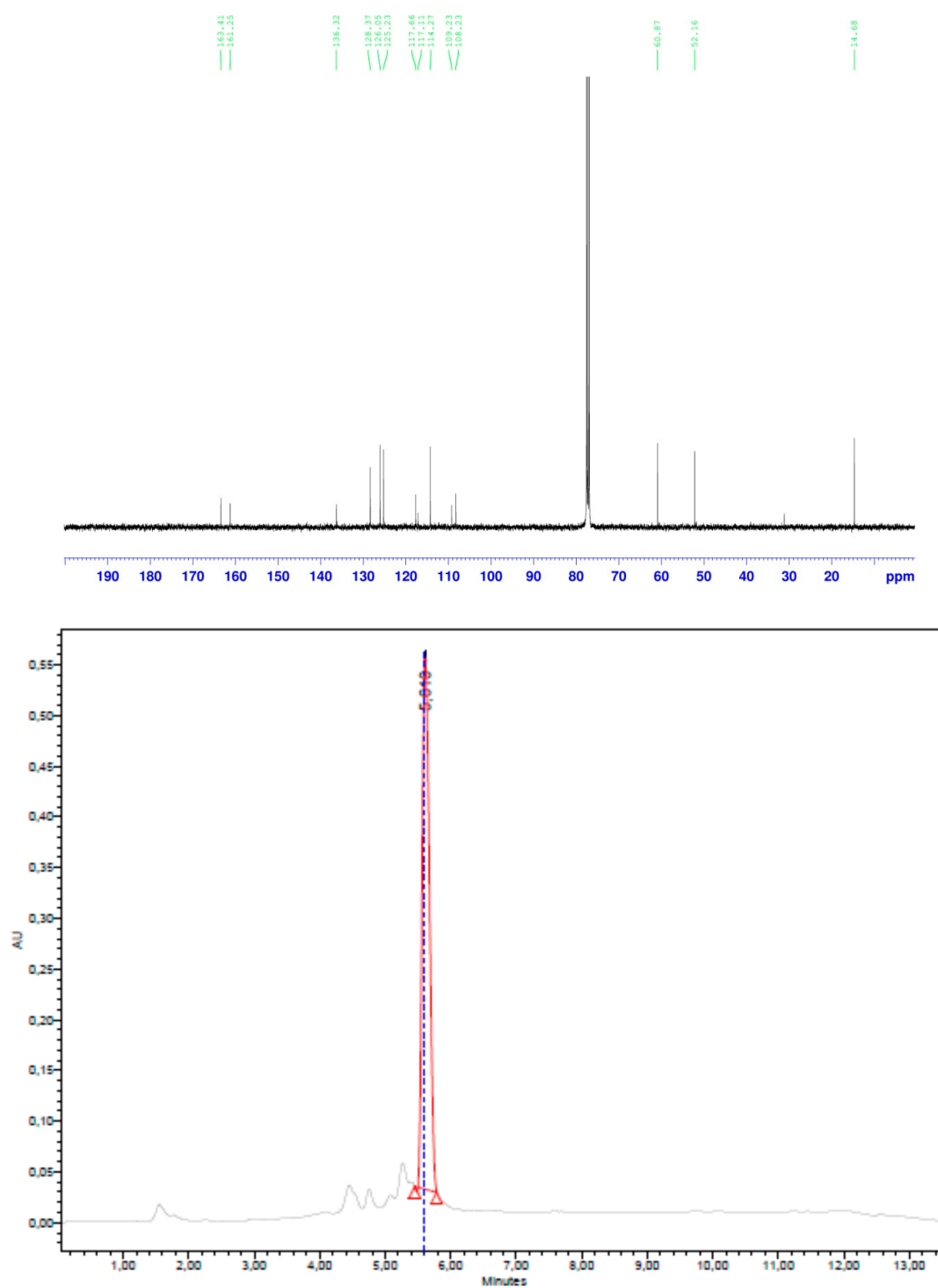


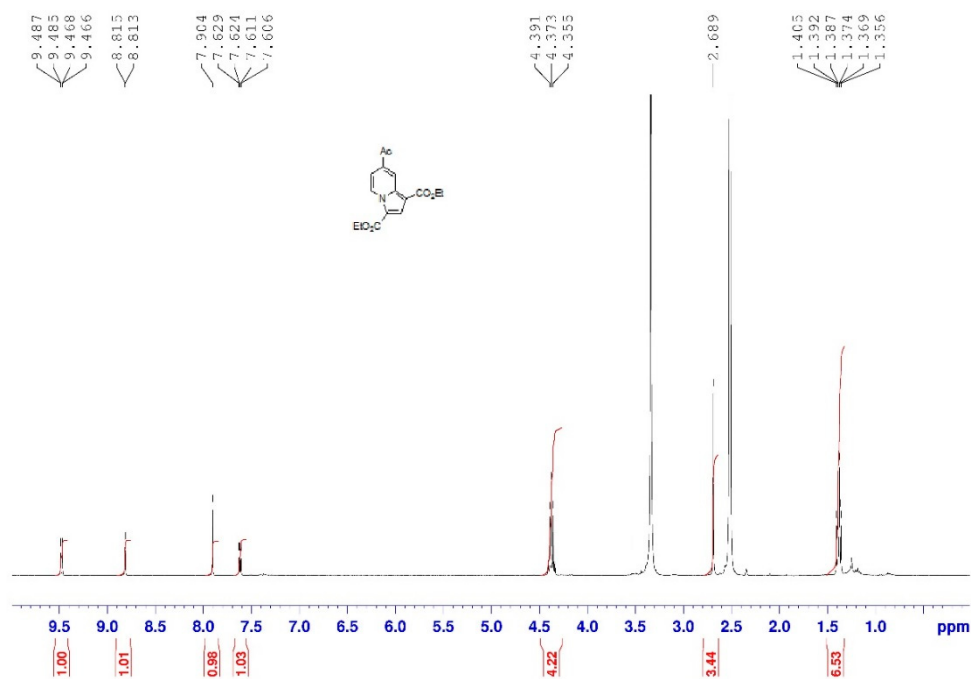
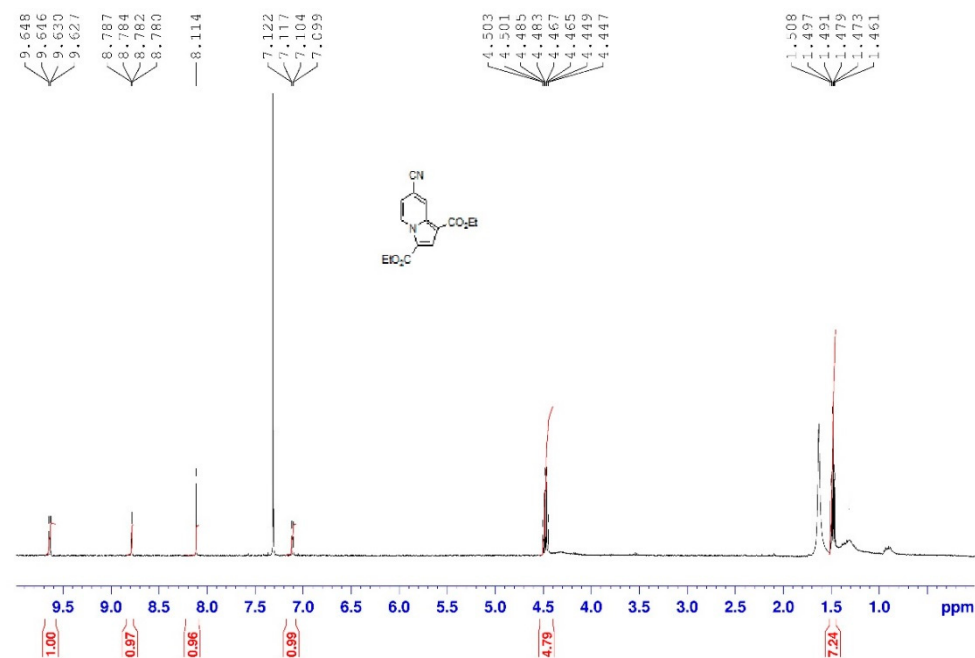
**1-Ethyl 3-methyl 7-acetylindolizine-1,3-dicarboxylate (18)**

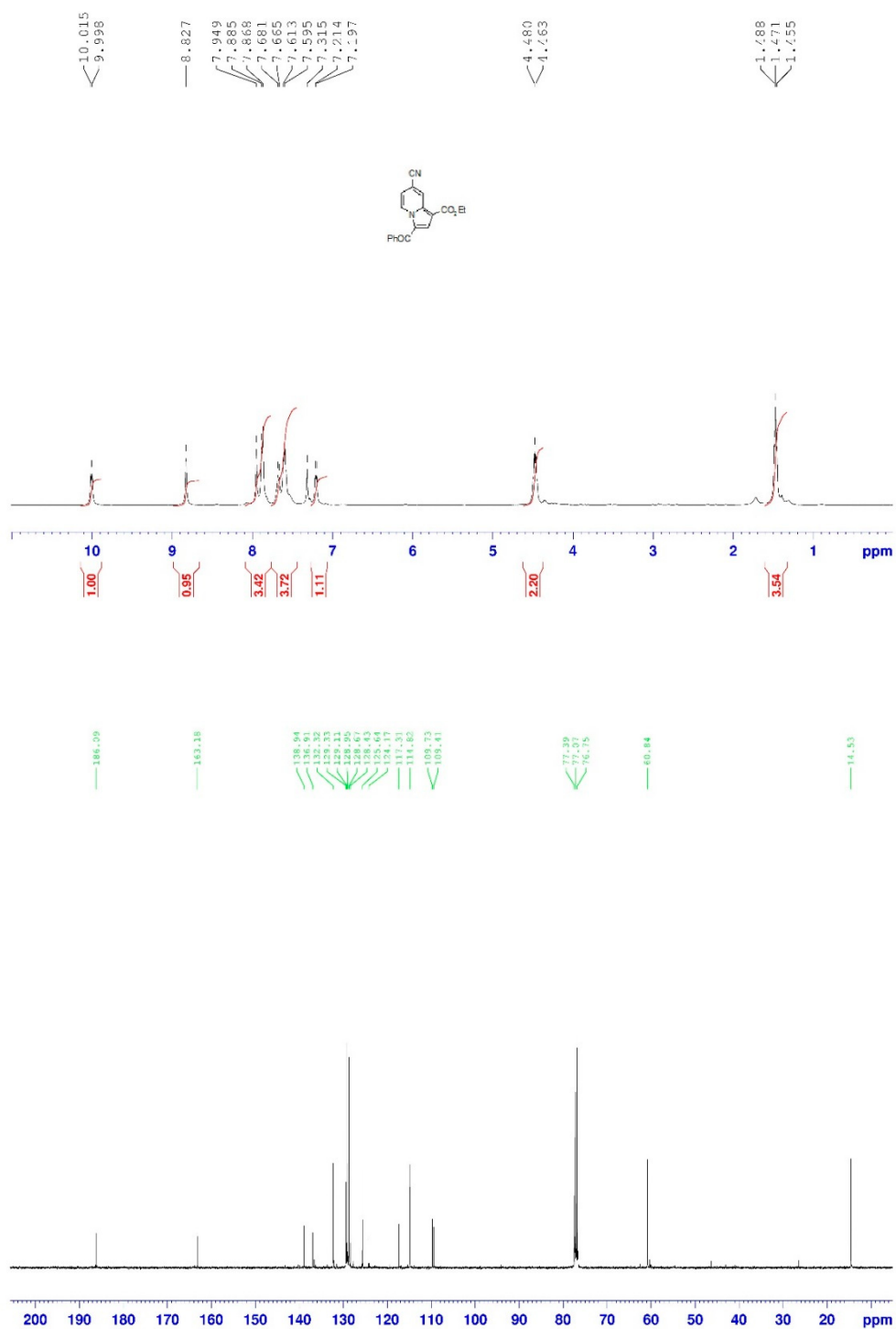


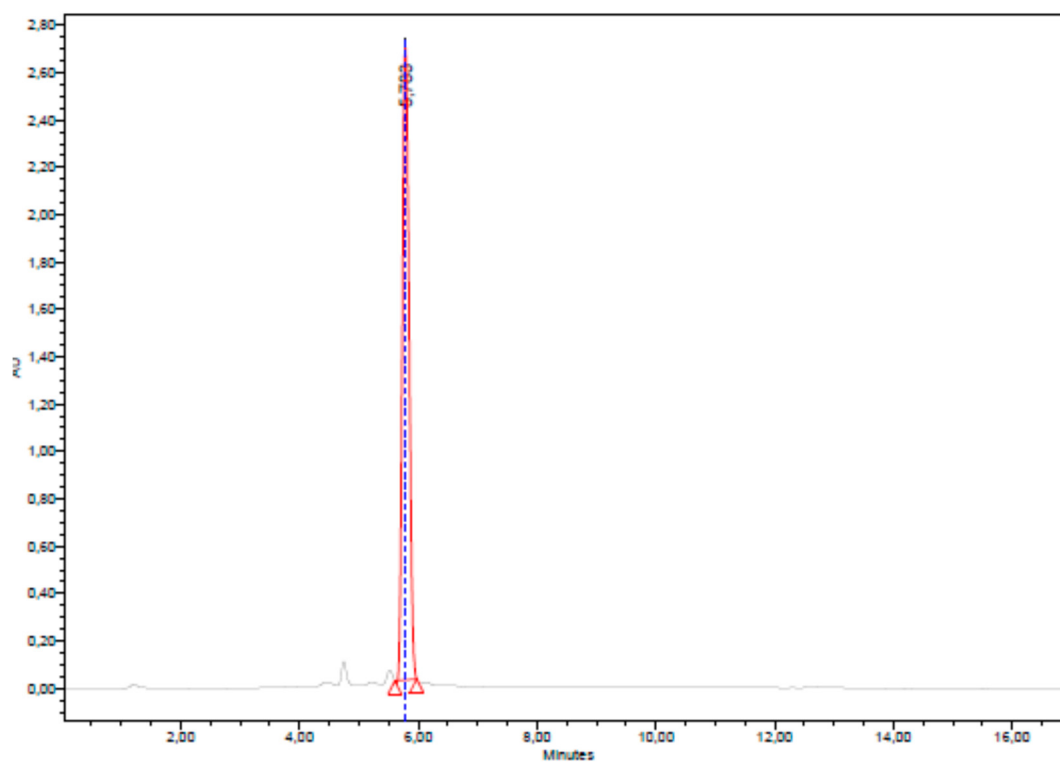
1-Ethyl 3-methyl 7-(trifluoromethyl)indolizine-1,3-dicarboxylate (19a) and 1-methyl 3-methyl 7-(trifluoromethyl)indolizine-1,3-dicarboxylate (19b) (30/70 ratio)

**Ethyl 3-methyl 7-cyanoindolizine-1,3-dicarboxylate (20)**

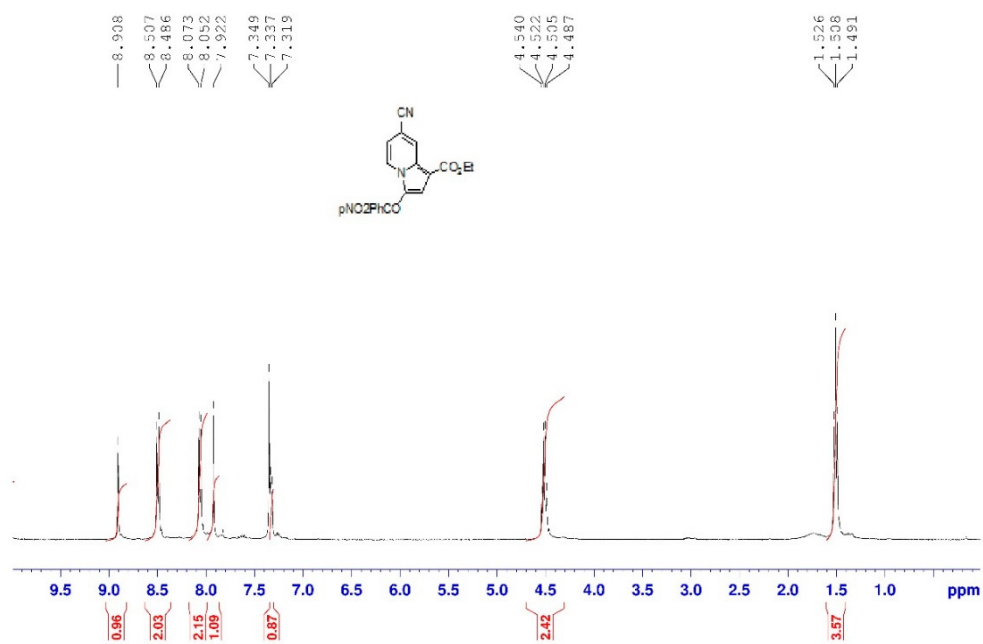


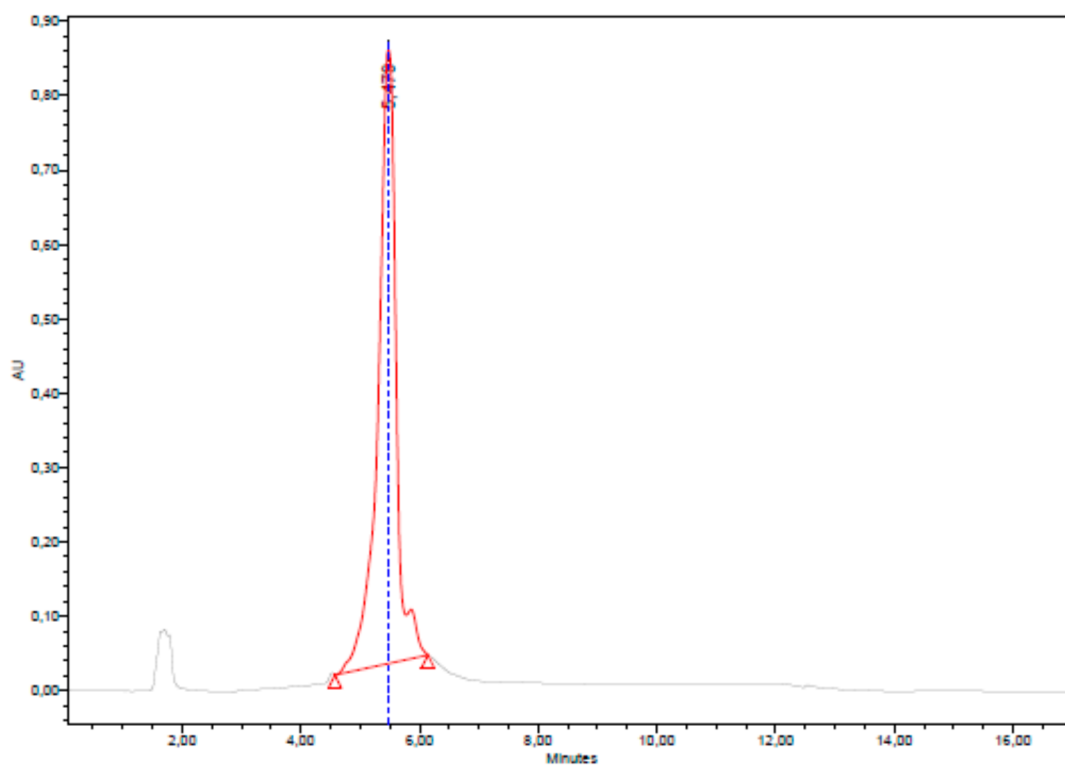
1,3-Diethyl 7-acetylindolizine-1,3-dicarboxylate (22)**1,3-Diethyl 7-cyanoindolizine-1,3-dicarboxylate (23)**

1-Ethyl 3-benzoyl-7-cyanoindolizine-1-carboxylate (24)

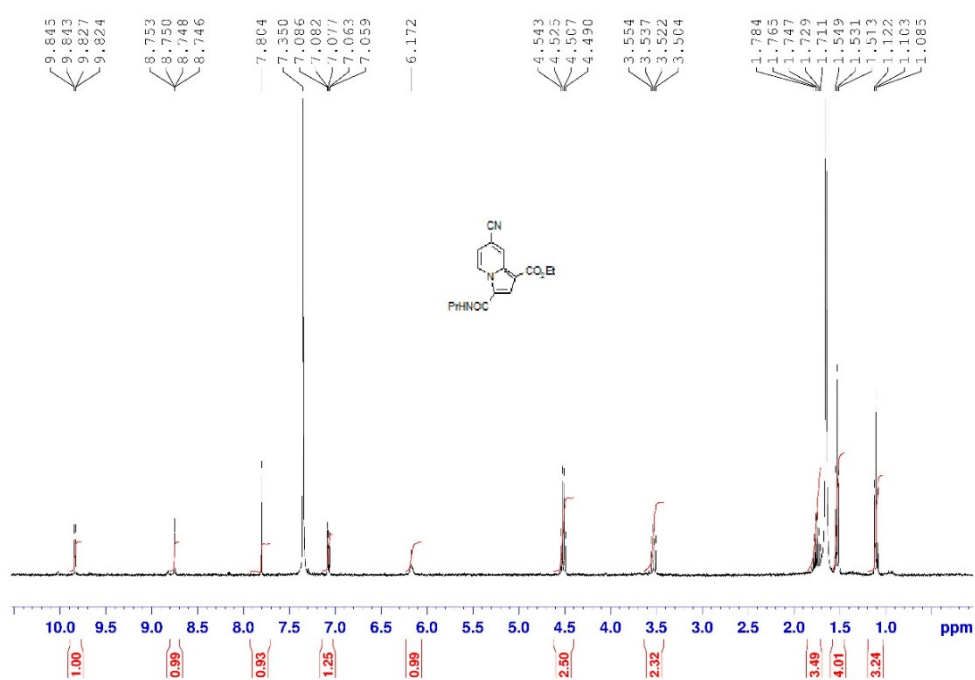


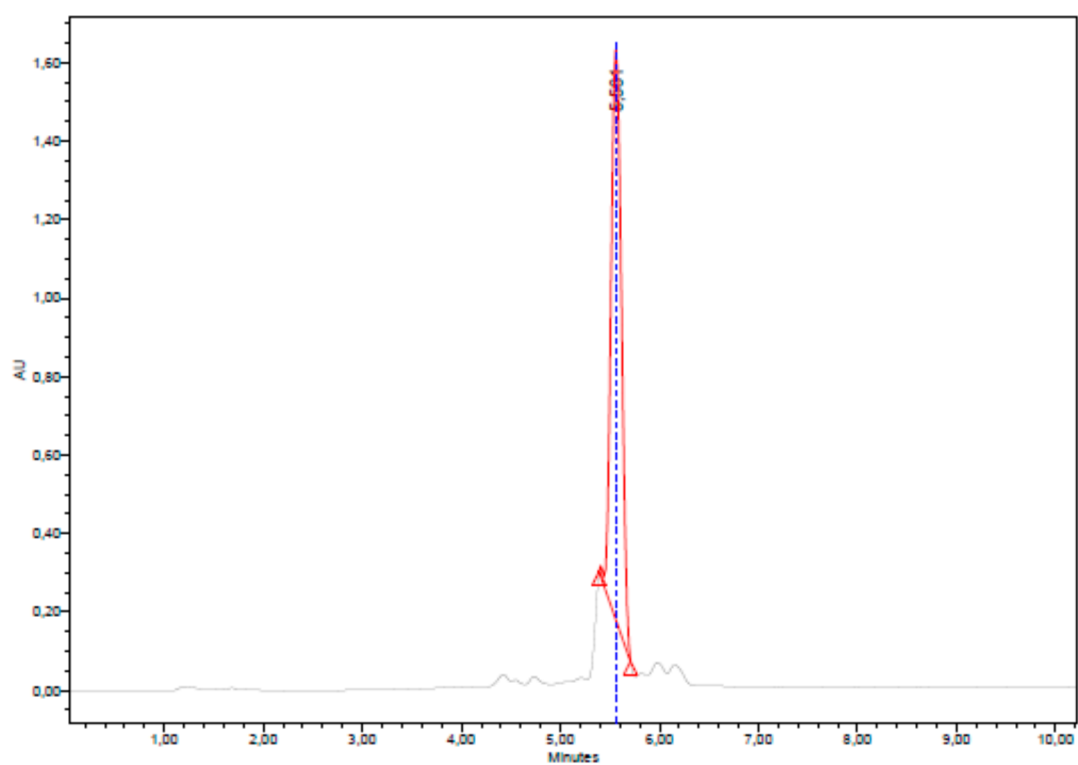
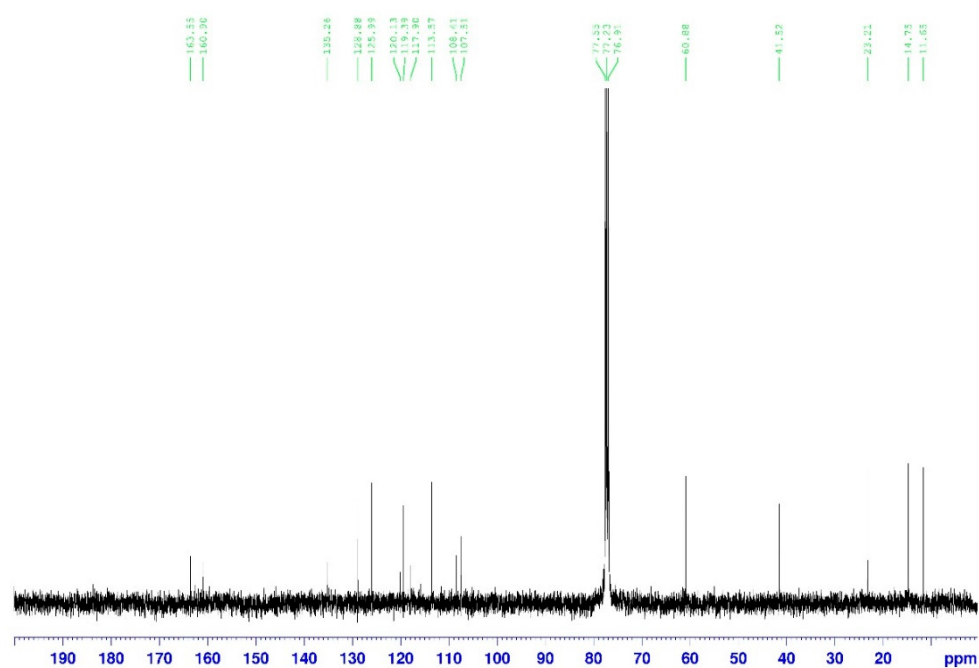
1-Ethyl 3-(4-nitrobenzoyl)-7-cyanoindolizine-1-carboxylate (25)





1-Ethyl 7-cyano-3-(*N*-propylcarbamoyl)indolizine-1-carboxylate (26)





Methyl 1-(N-benzylcarbamoyl)-7-cyanoindolizine-3-carboxylate (28)