

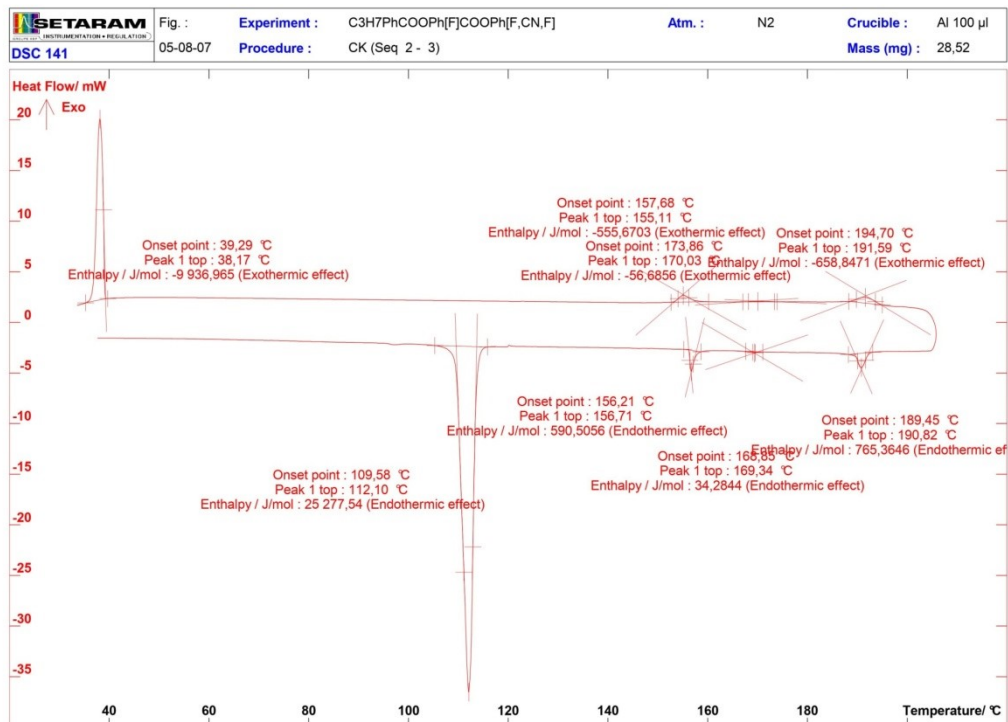
Supporting Information

Polar Nematic Phases with Enantiotropic Ferro- and Antiferroelectric Behaviour

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A



B

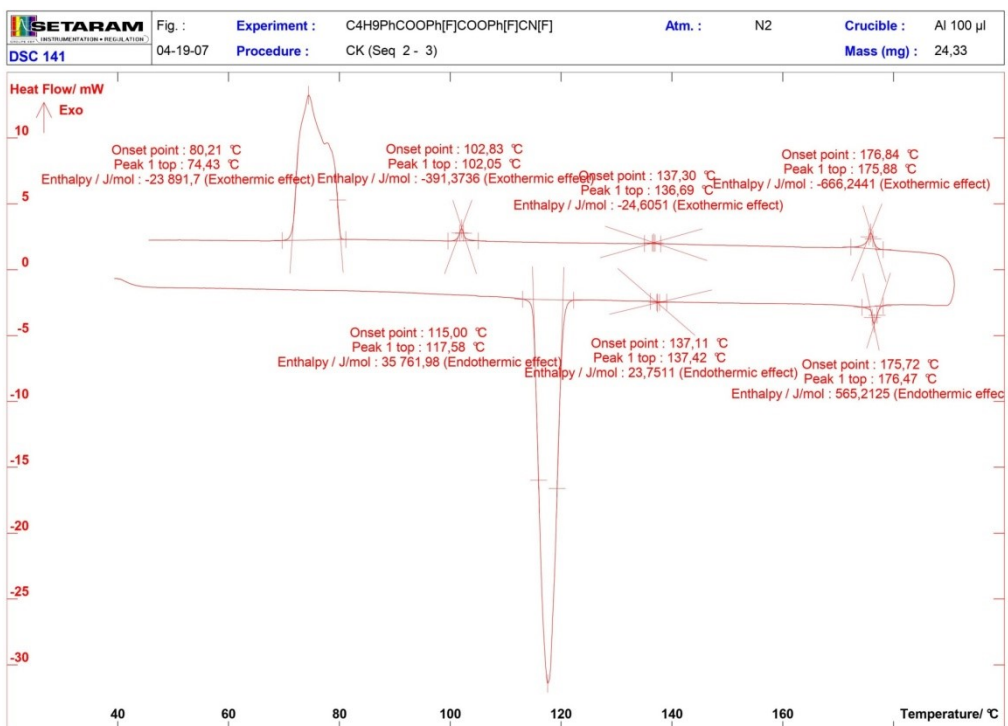


Fig. S1 The DSC thermograms of compound 3CN (A) and 4CN (B) in the heating cycles (down curves) and cooling cycles (upper curves).

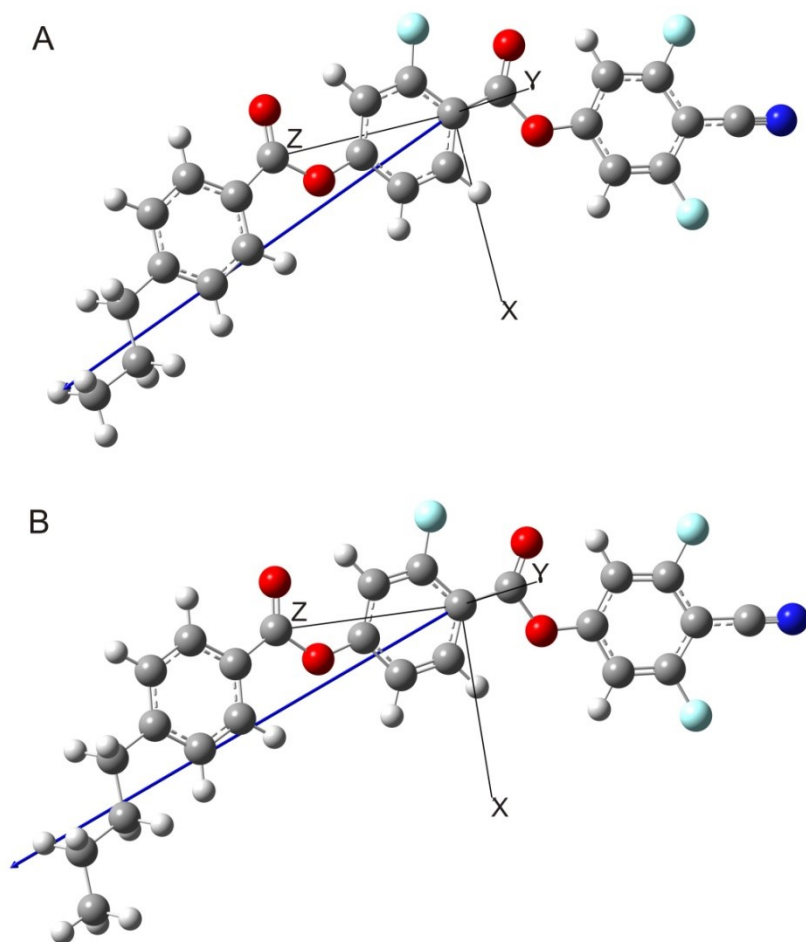


Fig. S2 The optimized geometric general structure of compounds 3CN (A) and 4CN (B); whereas x is the axis in the plane of the phenyl rings, y - the axis perpendicular to the plane of the phenyl rings and z -the axis along to the principal molecular axis.

VIDEO-S1

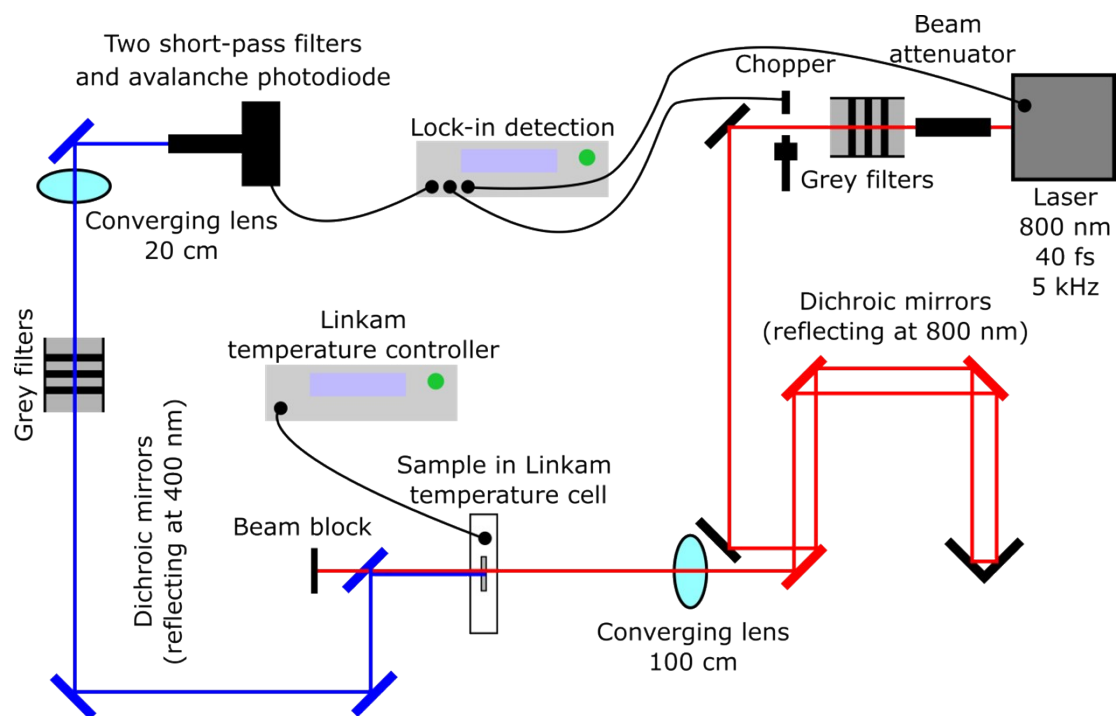
Video S1 The movie showing the texture change obtained for material between untreated glass plates under cross polarizers during cooling from the nematic (N) to the ferroelectric nematic (N_F) phases for 3CN compound.

VIDEO-S2

Video S2 The movie showing the texture change obtained for planarly aligned material after applying a triangular in-plane wave electric field of 2 Vpp/20 μm with a frequency of 100 mHz in the N_F phase of the 3CN compound.

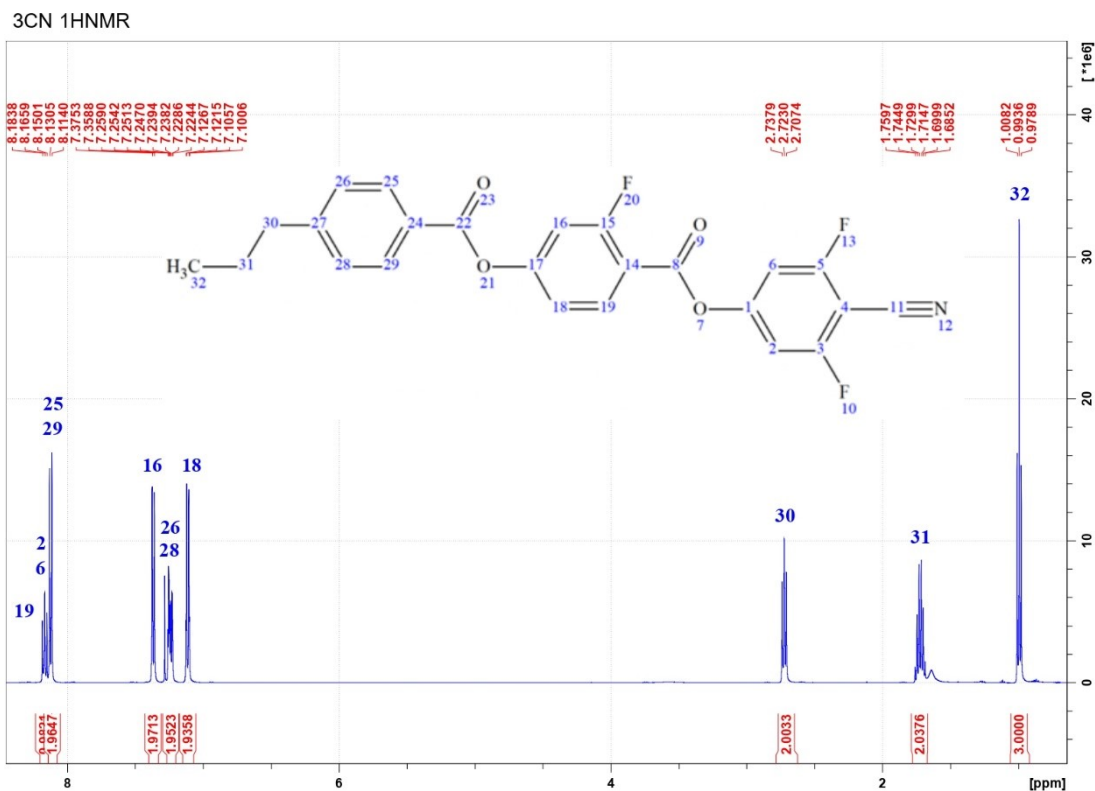
VIDEO-S3

Video S3 The movie showing the texture change obtained for planarly aligned material after applying a triangular in-plane wave electric field of 1.2 Vpp/20 μm with a frequency of 100 mHz in the N_F phase of the 4CN compound.

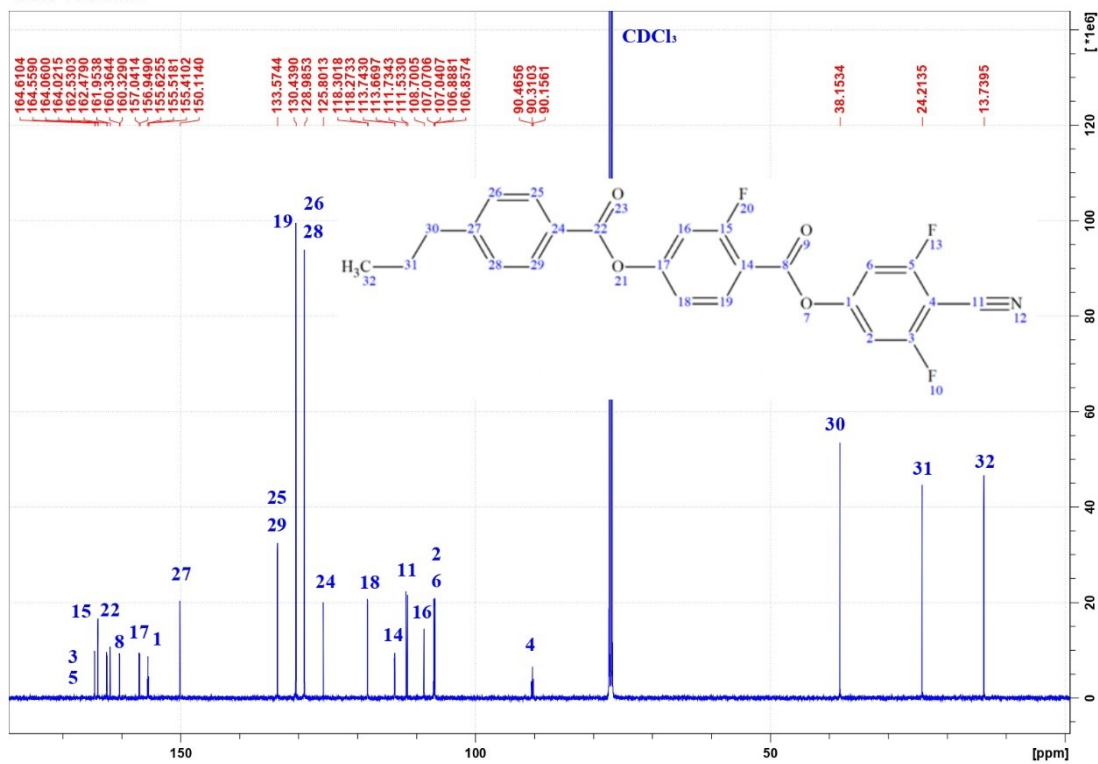


Scheme S1 The set-up for the temperature-dependent second harmonic generation (SHG) measurements.

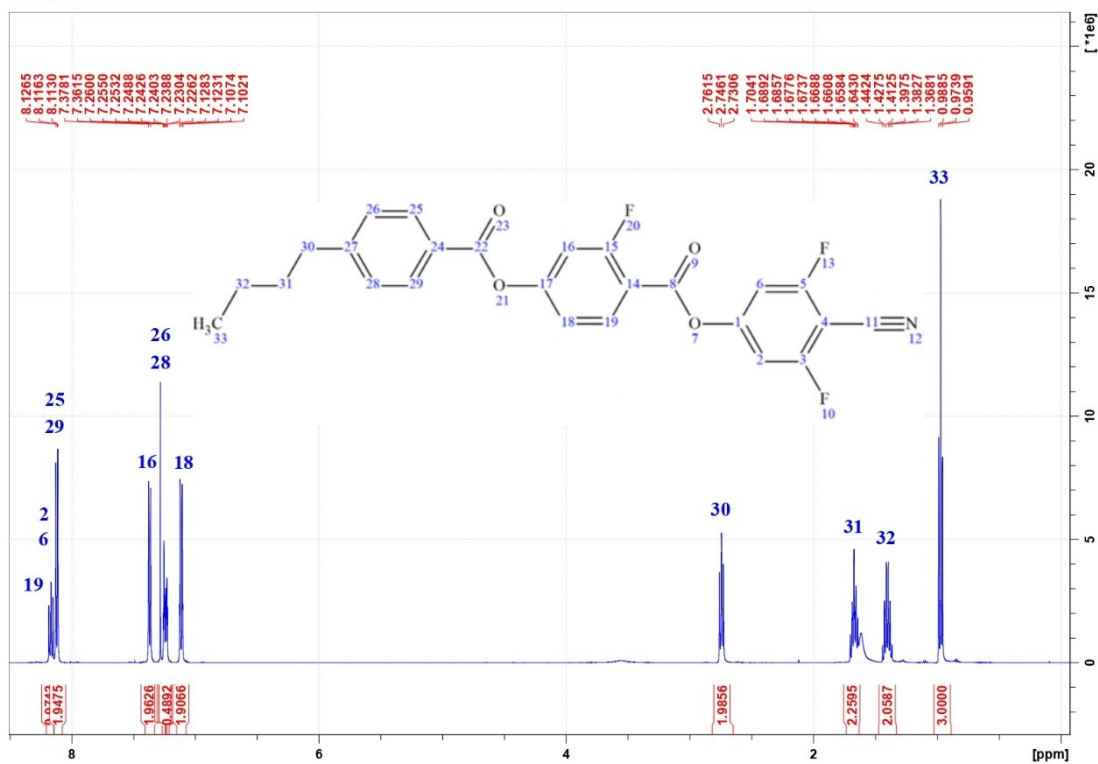
The structure of 3CN and 4CN compounds was confirmed by using of ^1H and ^{13}C NMR Spectrometer ((Bruker, Avance III HD, 500 Hz; in CDCl_3 , Billerica, MA, USA). The spectra are presented below.



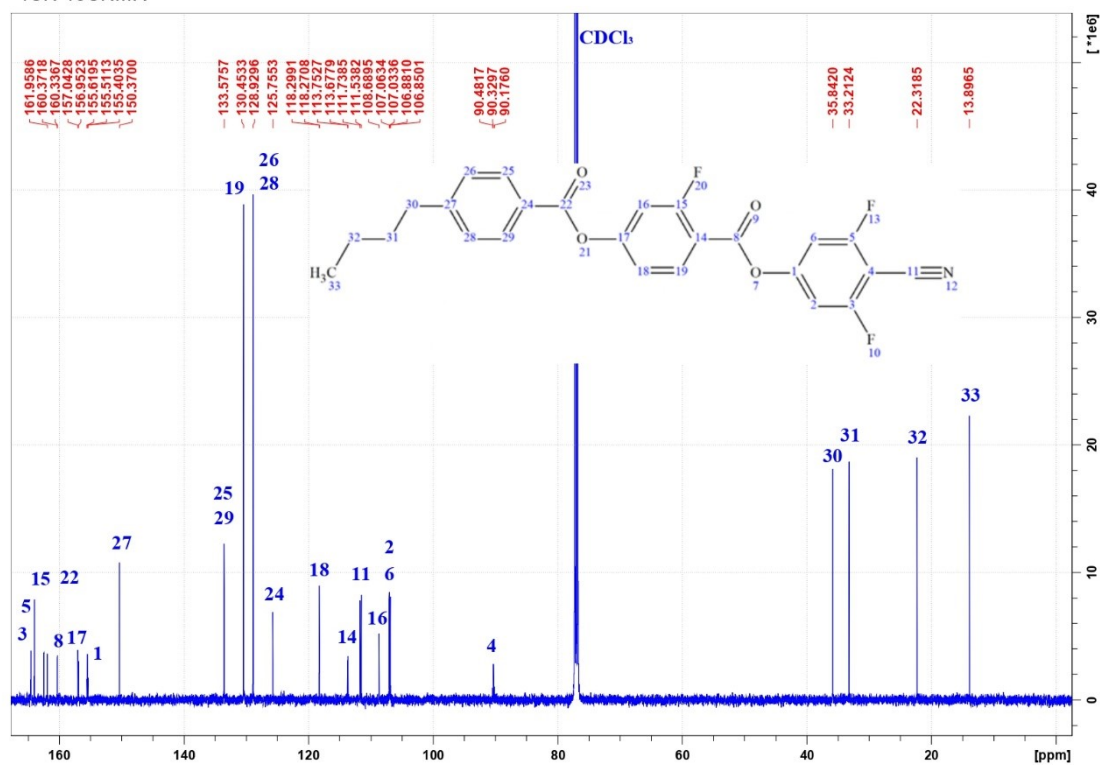
3CN 13CNMR



4CN 1HNMR

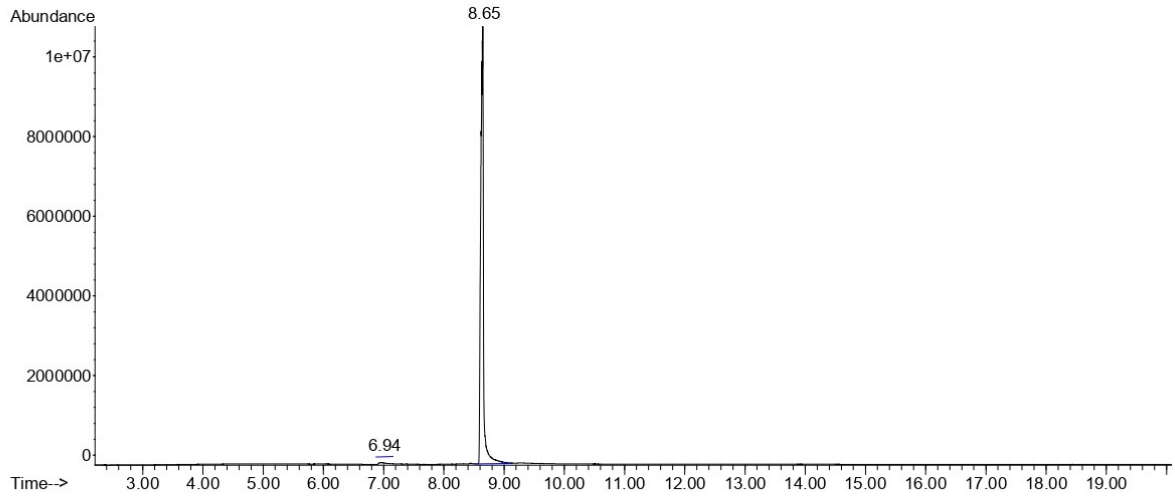


4CN 13CNMR



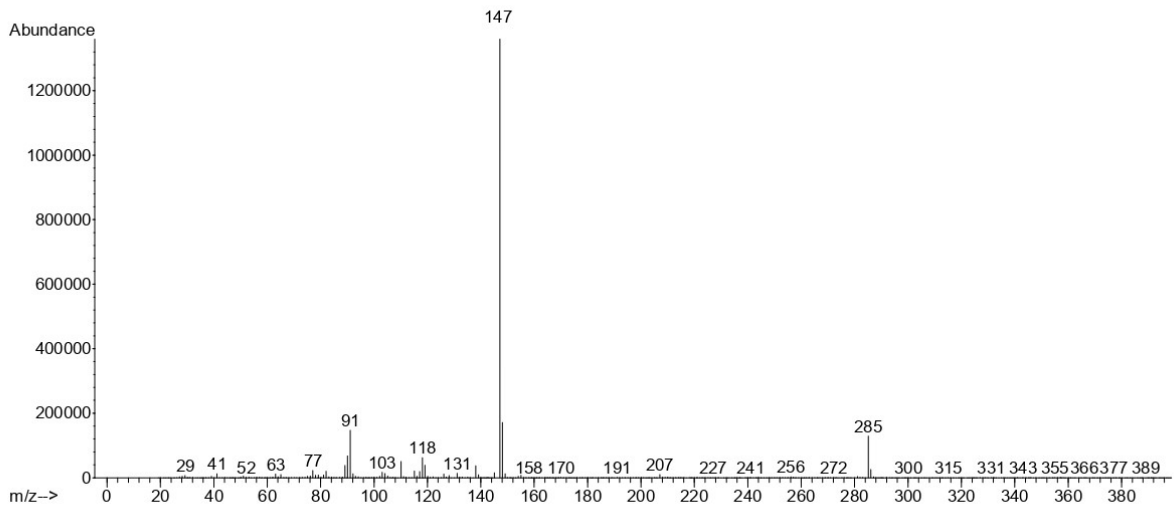
The purity of 3CN and 4CN compounds was determined by thin-layer chromatography (TLC) and GC-MS(EI) (Agilent 6890N, Santa Clara, CA, USA) chromatography systems. GC chromatograms with MS spectra are presented below.

3CN GC/MS

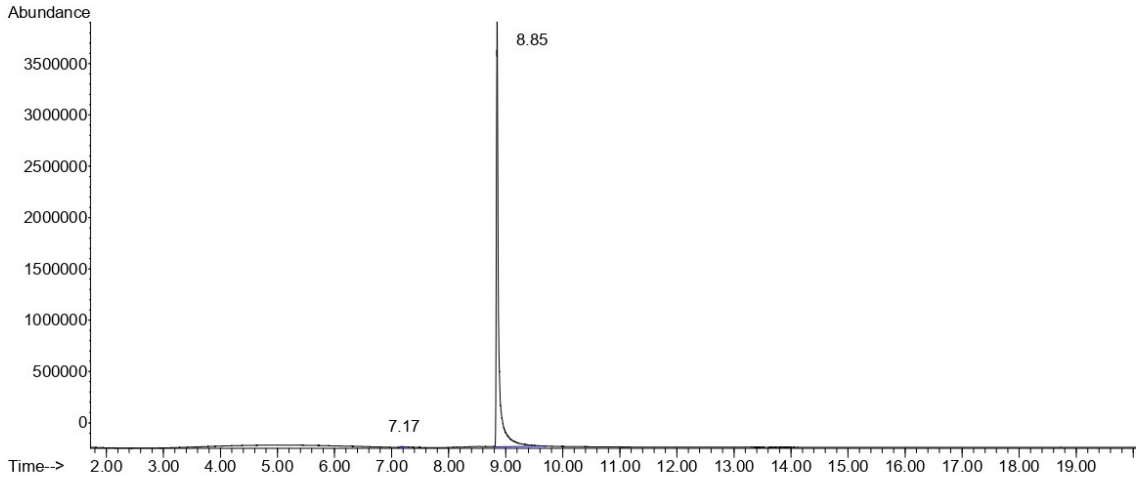


peak #	R.T. min	Start min	End min	PK TY	peak height	corr. area	corr. % max.	% of total
1	6.940	6.874	7.154	M	47843	3384325	0.96%	0.953%
2	8.646	8.526	9.131	M	11139128	351764372	100.00%	99.047%

Sum of corrected areas: 355148697



4CN GC/MS



peak #	R.T. min	Start min	End min	PK TY	peak height	corr. area	corr. % max.	% of total
1	7.167	7.123	7.249	M	7158	251709	0.22%	0.216%
2	8.850	8.798	9.710	M	4215081	116220732	100.00%	99.784%

Sum of corrected areas: 116472441

