Electronic Supplementary Material (ESI) for Polymer Chemistry.

Synthesis of Carbazole-Chalcone *Bis*-Oxime Esters (CCBOEs) as Blue Light Photoinitiators of Polymerization

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Experimental Section

Chemicals and Materials

Trimethylolpropane triacrylate (TMPTA) was purchased from Allnex. The commercial photoinitiator, diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide (TPO) was purchased from Lambson Ltd (UK). *N*-tert-butyl-α-phenylnitrone (PBN) was obtained from TCI Europe (Paris, France) and was used as the free radical trapping agent. The colloidal silica suspension (LUDOX AS 30, 30 wt% suspension in H_2O) used to determine the impulse response function of the fluorimeter was obtained from Sigma-Aldrich.

UV-visible Absorption Properties

UV-visible absorption spectra of OXEs in DCM (2×10^{-5} M) were obtained with a JASCO V730 spectrometer. The molar extinction coefficients of the different dyes were determined using the S1 formula. Steady-state photolysis refers to the UV-visible absorption spectrum of oxime esters dissolved in DCM (2×10^{-5} M), with measurements taken at various irradiation durations (LED@405 nm, 110 mW.cm^{-2}).

$$A = \varepsilon \times L \times C \qquad \text{(S1 formula)}$$

In S1, A is the absorbance of the oxime ester dissolved in DCM, ε is the molar extinction coefficient, L is the optical path length of 1cm, and C is the concentration of the solution.

Free Radical Photopolymerization Experiments

CCBOEs (at a concentration of 2×10^{-5} mol.g^{-1}) and the monomer TMPTA were mixed and stirred in the dark for 24 hours. Photopolymerization experiments were conducted using 405 nm, 450 nm and 470 nm LED with light intensities of 110 mW.cm^{-2}. To prevent oxygen inhibition, thin samples were prepared using the lamination and deposition methods, resulting in sample thicknesses of 25 μm, respectively.

The polymerization curves of TMPTA were obtained using the JASCO FTIR-4600 instrument. The polymerization kinetics for thin and thick samples were evaluated by calculating the areas under the acrylate characteristic peaks at 1630 cm^{-1},

respectively. The functional conversion (FC) of the monomer was determined using the S2 equation:

$$FC(\%) = (A_0 - A_t)/A_0 \times 100\% \qquad \text{(S2 formula)}$$

In S2, A_0 represents the ratio of the characteristic peak area at t = 0 s; A_t represents the ratio of the characteristic peak area at t s.

Fluorescence experiments

Fluorescence emission spectra of PIs in acetonitrile (5×10^{-5} M) were obtained using a spectrofluorometer (JASCO FP-750). Fluorescence lifetimes of PIs were investigated through a time correlated single-photon counting system using a HORIBA PPD-850 detector with an excitation wavelength at 367 nm. The pulse duration of apparatus was shorter than 1.40 ns and impulse response function (IRF) was obtained through the colloidal silica suspension LUDOX®.

Energy calculation

Singlet excited-state energies (E_{S1} in kcal.mol^{-1}) of CCBOEs were calculated by equation (S3). Triplet state energy (E_T) and N-O bond dissociation energy (BDE) of CCBOEs were calculated with the density functional theory at the UB3LYP/6-31G* level. Electronic absorption spectra were determined by time-dependent density functional theory at MPW1PW91/6-31G* level of theory on the relaxed geometries calculated at the UB3LYP/ 6-31G* level of theory. Enthalpies of the cleavage process of the N-O bond ($\Delta H_{Cleavage}$) from CCBOEs were calculated by equation (S4) and equation (S5), based on the energies of the singlet or triplet excited states (E_{S1} or E_{T1}) and the dissociation energies of the N-O bond (BDE).

$$E_{s1} = 1240 / WL \times 23.06 \text{ kcal.mol}^{-1} \qquad \text{(S3 formula)}$$

$$\Delta H_{Cleavage\ S1} = BDE_{(N\text{-}O)} - E_{s1} \qquad \text{(S4 formula)}$$

$$\Delta H_{Cleavage\ T1} = BDE_{(N\text{-}O)} - E_{T1} \qquad \text{(S5 formula)}$$

In S3, WL is the x-coordinate of the intersection of the normalized fluorescence emission spectra and the normalized UV-visible absorption spectra.

Calculation of thermal initiation efficiency

The OXEs/TMPTA systems were heated from 20 °C (10 °C/min) to 250 °C under nitrogen using a Mettler Toledo DSC. The FCs were calculated from the heat release by the mixture during the entire process, and the formula is shown in S6 equation:

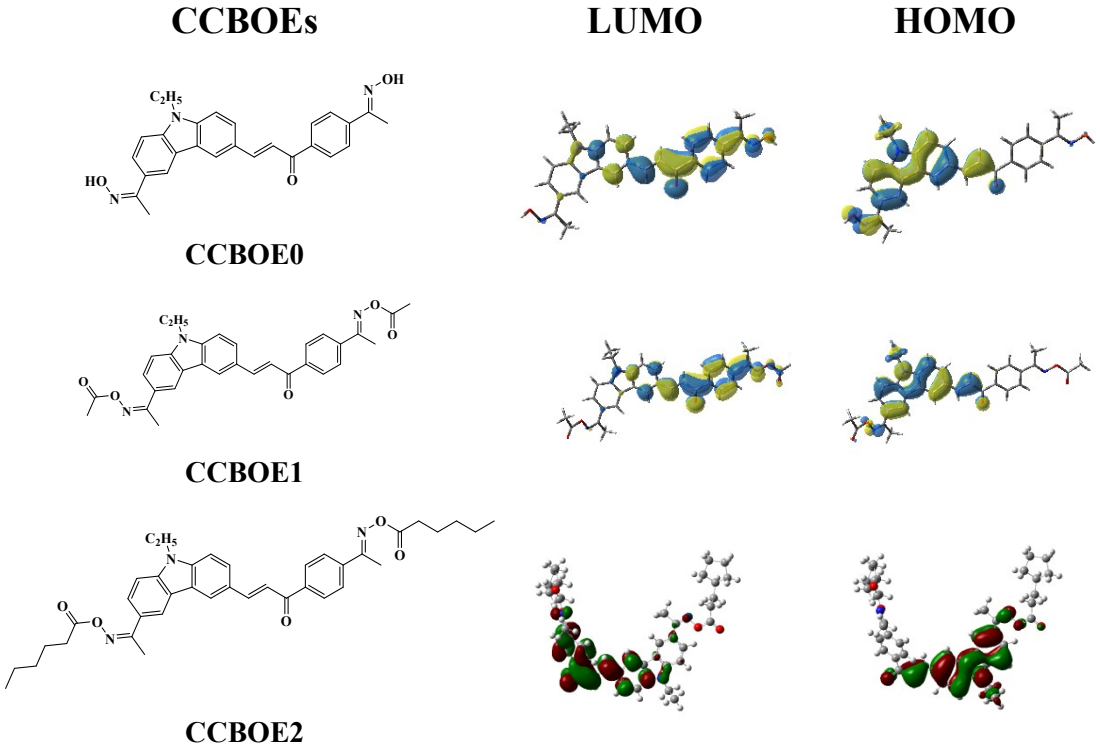
$$FC(\%) = (\text{heat released})/795.9 \qquad \text{(S6 formula)}$$

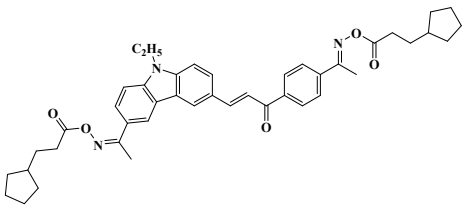
In S6, 795.9 kJ/g is the heat released during the polymerization of TMPTA.

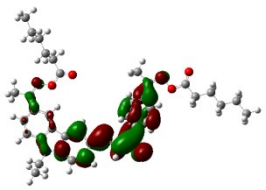
Direct Laser Write (DLW)

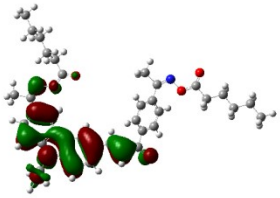
Evenly distribute the prepared formulation into a self-made glass jar with a thickness of 2 millimeters. Then, use of a laser diode (with a beam size of approximately 50 μm, operating at 405 nm and 110 $mW.cm^{-2}$) as the light source, controlled by a computer program to spatially irradiate, enabled to create specific 3D patterns. After the Digital Light Writing (DLW) process, these 3D patterns were rinsed with acetone to remove uncured monomers. Finally, the surface of the printed 3D patterns were observed using a numerical optical microscopy and a scanning electron microscope (SEM).

Theoretical calculations









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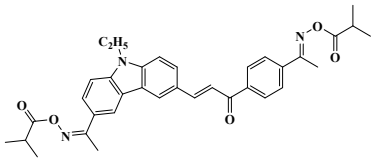

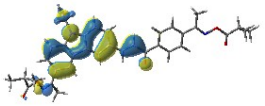

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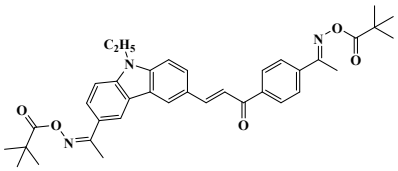

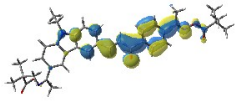

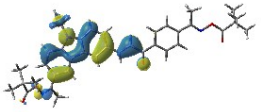

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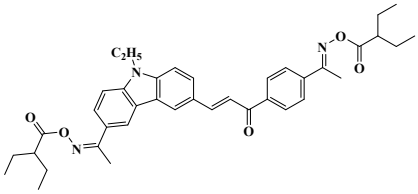

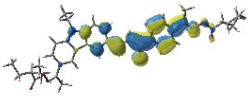

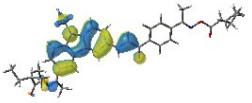

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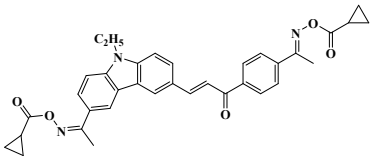

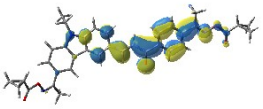

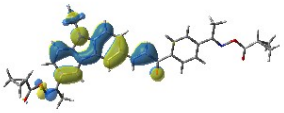

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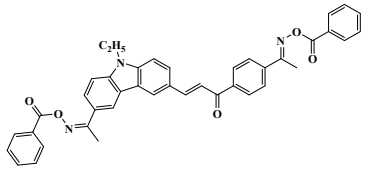

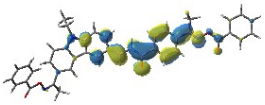

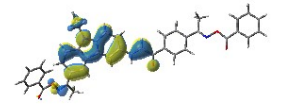

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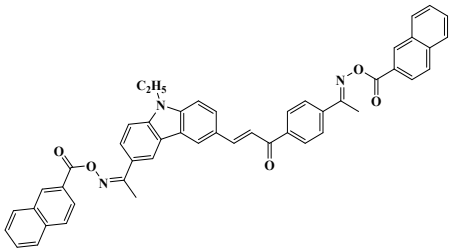

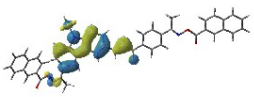

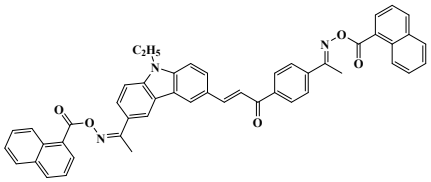

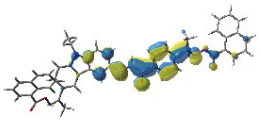

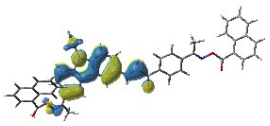

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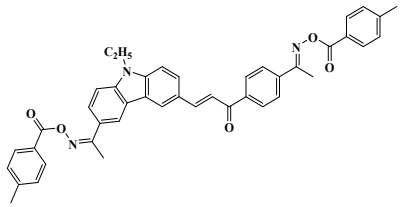

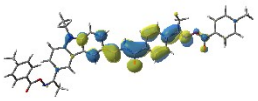

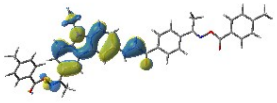

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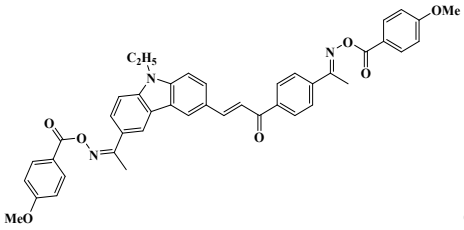

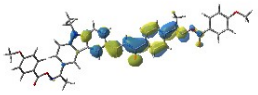

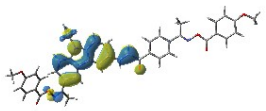

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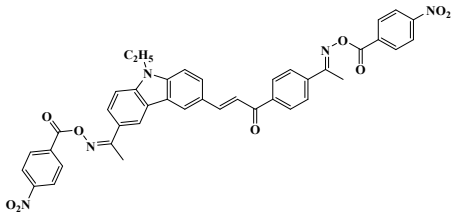

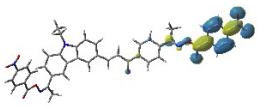

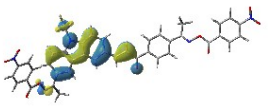

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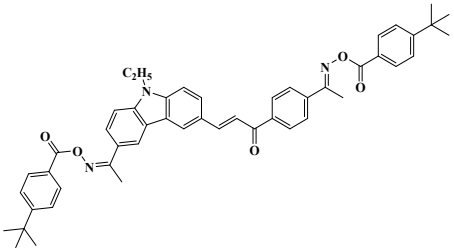

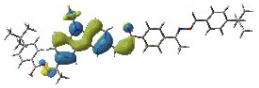

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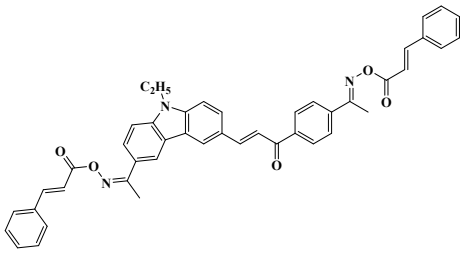

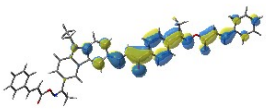

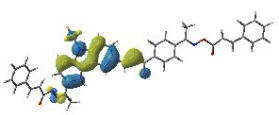

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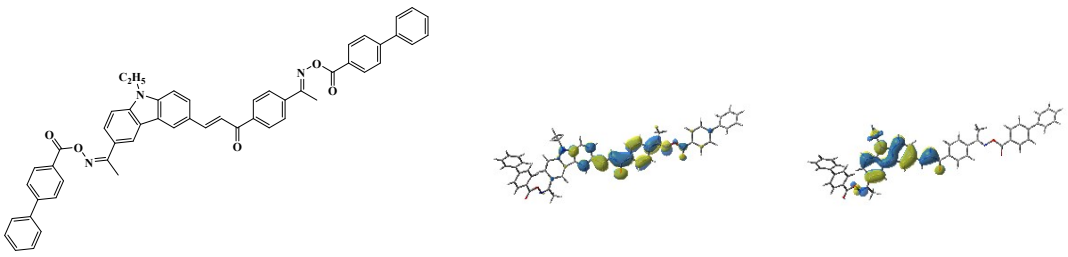


CCBOE16

Scheme S1. Contour plots of the HOMO and LUMO orbitals of CCBOEs determined at the UB3LYP/6-31G* level (iso-value = 0.02).

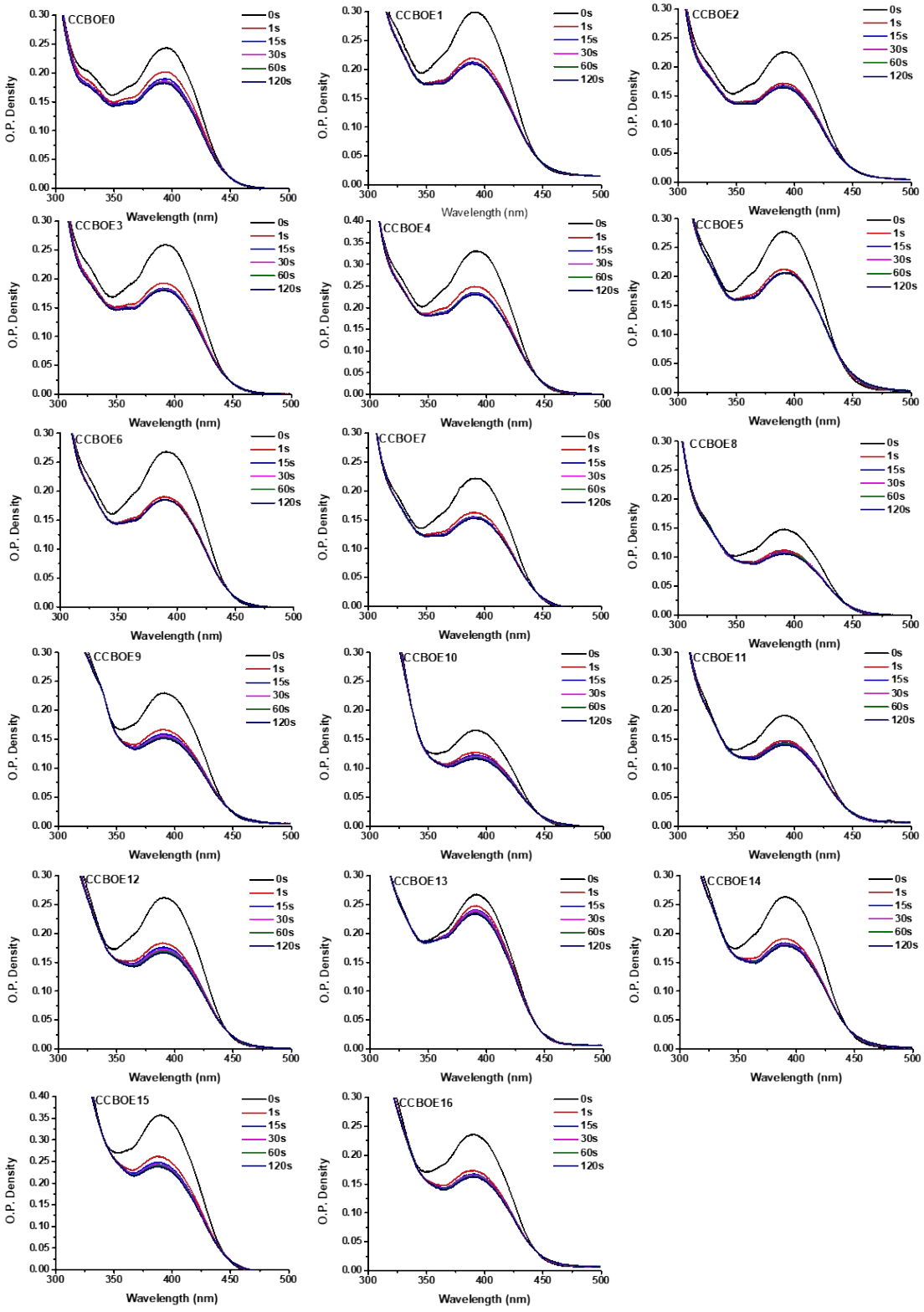


Figure S1. Steady-state photolysis of CCBOEs in DCM upon irradiation with a 405 nm LED.

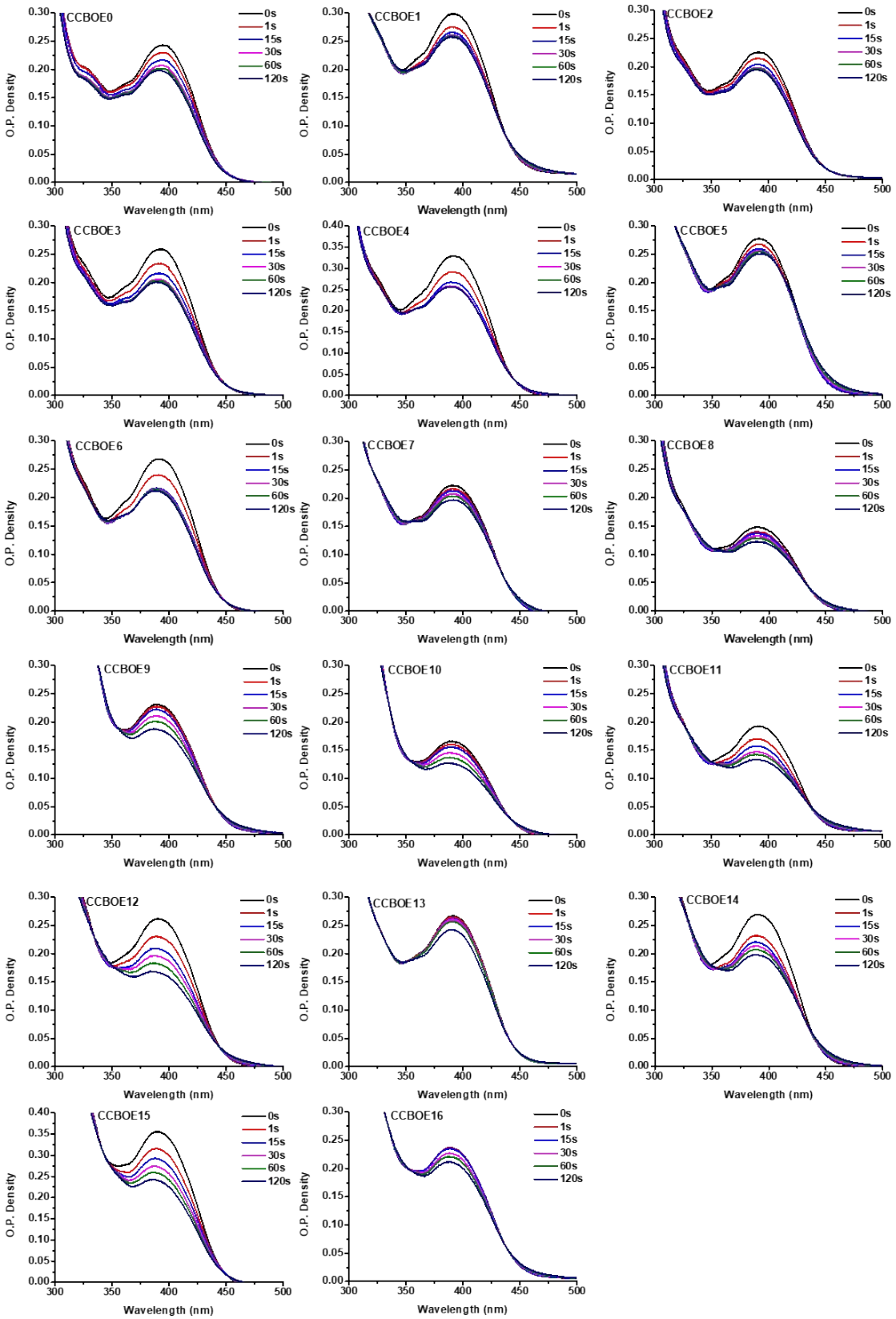


Figure S2. Steady-state photolysis of CCBOEs in DCM upon irradiation with a 450 nm LED

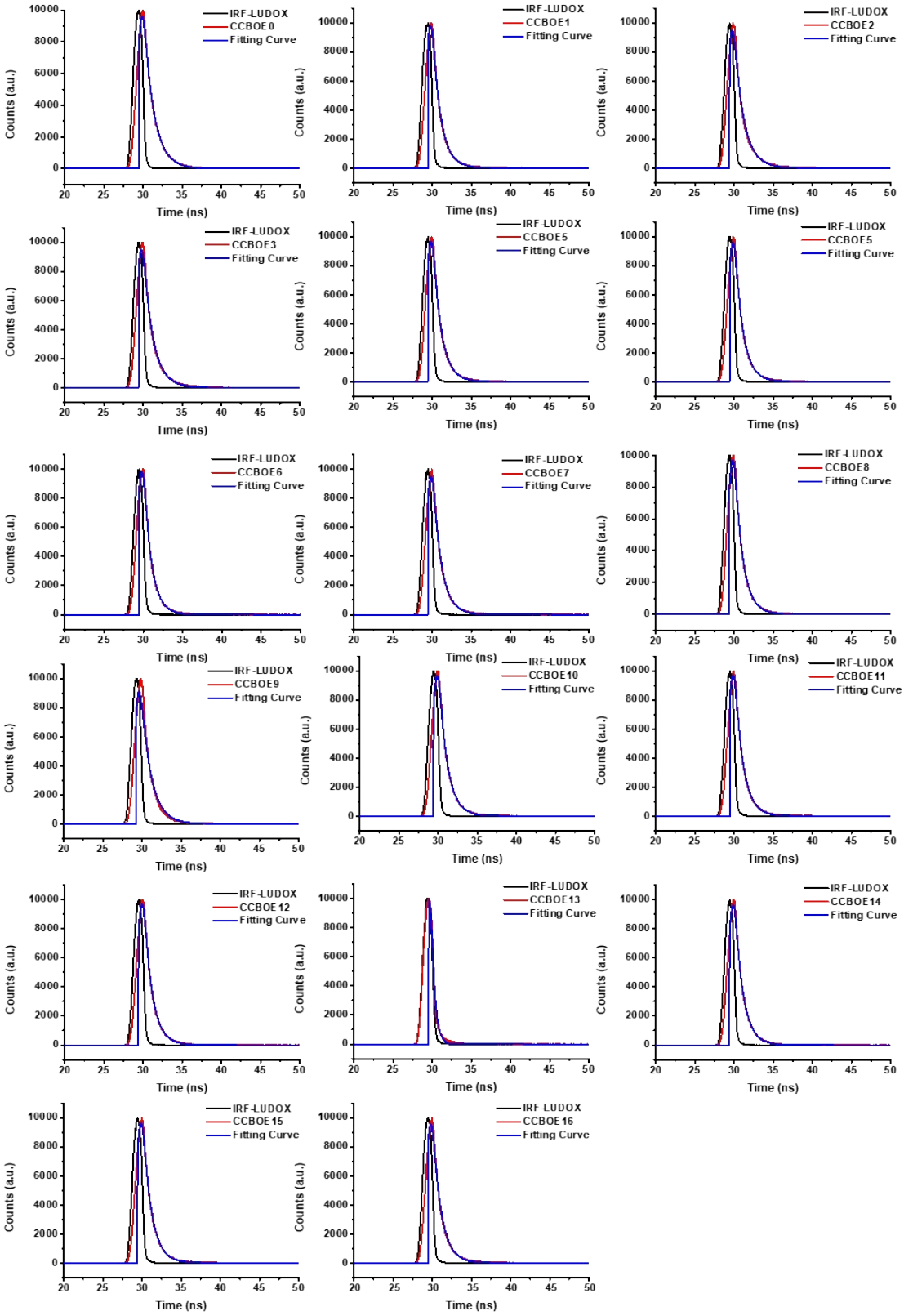


Figure S3. Fluorescence decay curves of CCBOEs in DCM

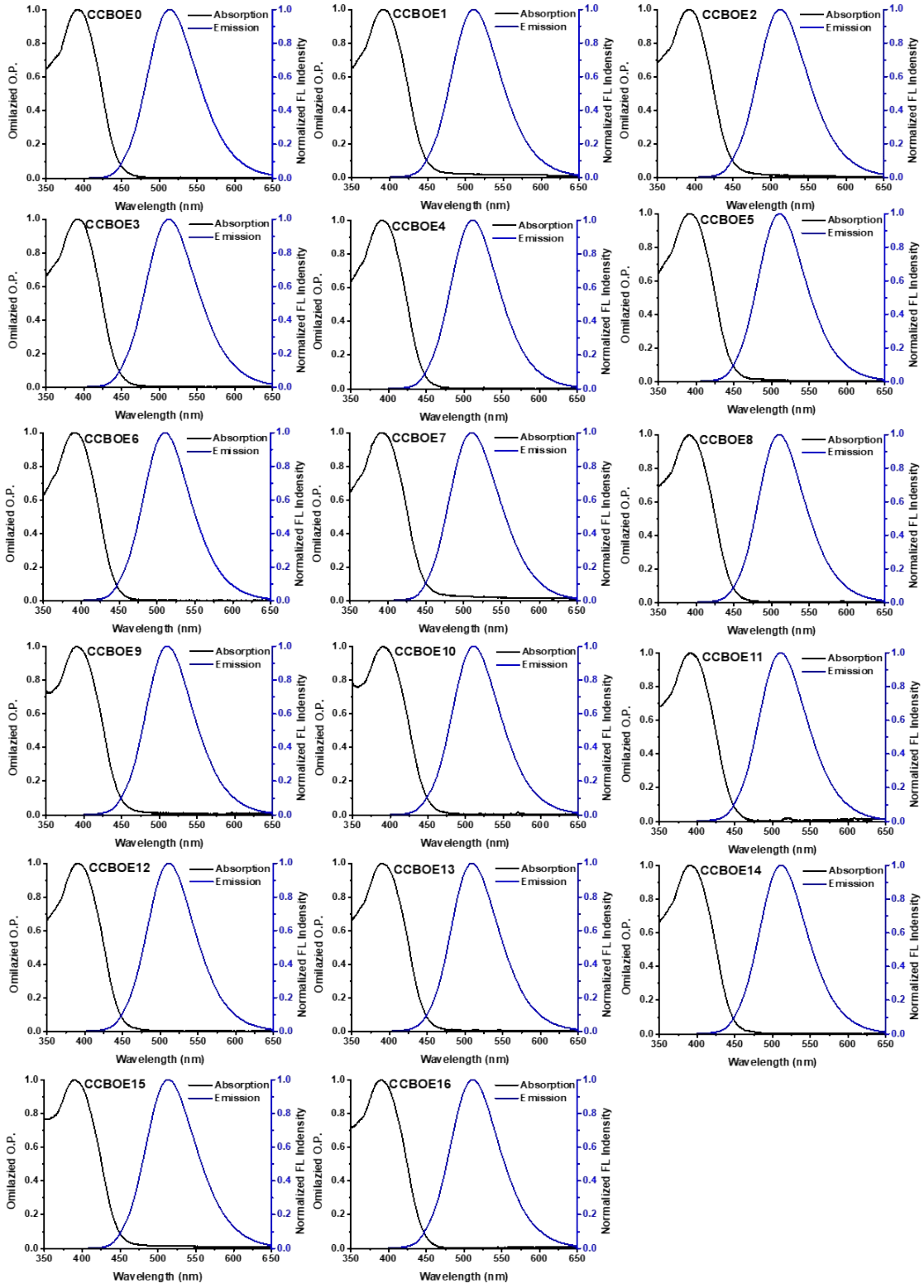


Figure S4. Singlet state energy determination of CCBOEs

Table S1. N–O BDE, E_{S1}, E_T, $\Delta H_{Cleavage\ S1}$, $\Delta H_{Cleavage\ T1}$ and lifetimes of different CCBOEs

CCBOEs	N–O BDE (kcal.mol^{-1})	E_{S1} (kcal.mol^{-1})	$\Delta H_{Cleavage\ S1}$ (kcal.mol^{-1})	E_T (kcal.mol^{-1})	$\Delta H_{Cleavage\ T1}$ (kcal.mol^{-1})	Lifetime (ns)
CCBOE0	63.2[a] 66.6[b]	63.75	-0.55[a] 2.85[b]	50.17	13.03[a] 16.43[b]	1.27
CCBOE1	45.9[a] 55.2[b]	63.77	-17.87[a] -8.57[b]	50.13	-4.23[a] 5.07[b]	1.05
CCBOE2	44.2[a] 44.8[b]	63.71	-19.51[a] -18.91[b]	49.90	-5.70[a] -5.10[b]	1.21
CCBOE3	44.1[a] 44.1[b]	63.99	-19.89[a] -19.89[b]	49.90	-5.8[a] -5.8[b]	1.22
CCBOE4	50.0[a] 52.1	63.88	-13.88[a] -11.78[b]	50.13	-0.13[a] 1.97[b]	1.06
CCBOE5	49.3[a] 51.5[b]	63.64	-14.34[a] -12.14[b]	50.16	-0.86[a] 1.34[b]	1.03
CCBOE6	42.5[a] 46.0[b]	63.99	-21.49[a] -17.99[b]	50.14	-7.64[a] -4.14[b]	0.97
CCBOE7	48.0[a] 51.2[b]	63.51	-15.51[a] -12.31[b]	50.14	-2.14[a] 1.06[b]	1.07
CCBOE8	45.7[a] 48.5[b]	63.68	-17.98[a] -15.18[b]	50.16	-4.46[a] -1.66[b]	1.03
CCBOE9	50.3[a] 53.3[b]	63.67	-13.37[a] -10.37[b]	50.15	0.15[a] 3.15[b]	1.28
CCBOE10	45.8[a] 48.7[b]	63.73	-17.93[a] -15.03[b]	50.08	-4.28[a] -1.38[b]	1.07
CCBOE11	50.2[a] 52.7[b]	63.75	-13.55[a] -11.05[b]	50.17	0.03[a] 2.53[b]	1.05
CCBOE12	50.0[a] 50.0[b]	63.81	-13.81[a] -13.81[b]	50.18	-0.18[a] -0.18[b]	1.05
CCBOE13	51.7[a]	64.38	-12.68[a]	50.05	1.65[a]	0.40

	52.7[b]		-11.68[b]		2.65[b]	
	45.9[a]		-17.78[a]		-1.62[a]	
CCBOE14		63.68		47.52		1.03
	48.5[b]		-15.18[b]		0.98[b]	
	54.8[a]		-8.8[a]		3.64[a]	
CCBOE15		63.60		50.16		1.07
	54.8[b]		-8.8[b]		3.64[b]	
	50.7[a]		-13.25[a]		0.54[a]	
CCBOE16		63.95		50.16		1.08
	52.9[b]		-11.05[b]		2.74[b]	

a: oxime ester groups connected to the carbazole group;

b: oxime ester groups connected to the benzene ring.

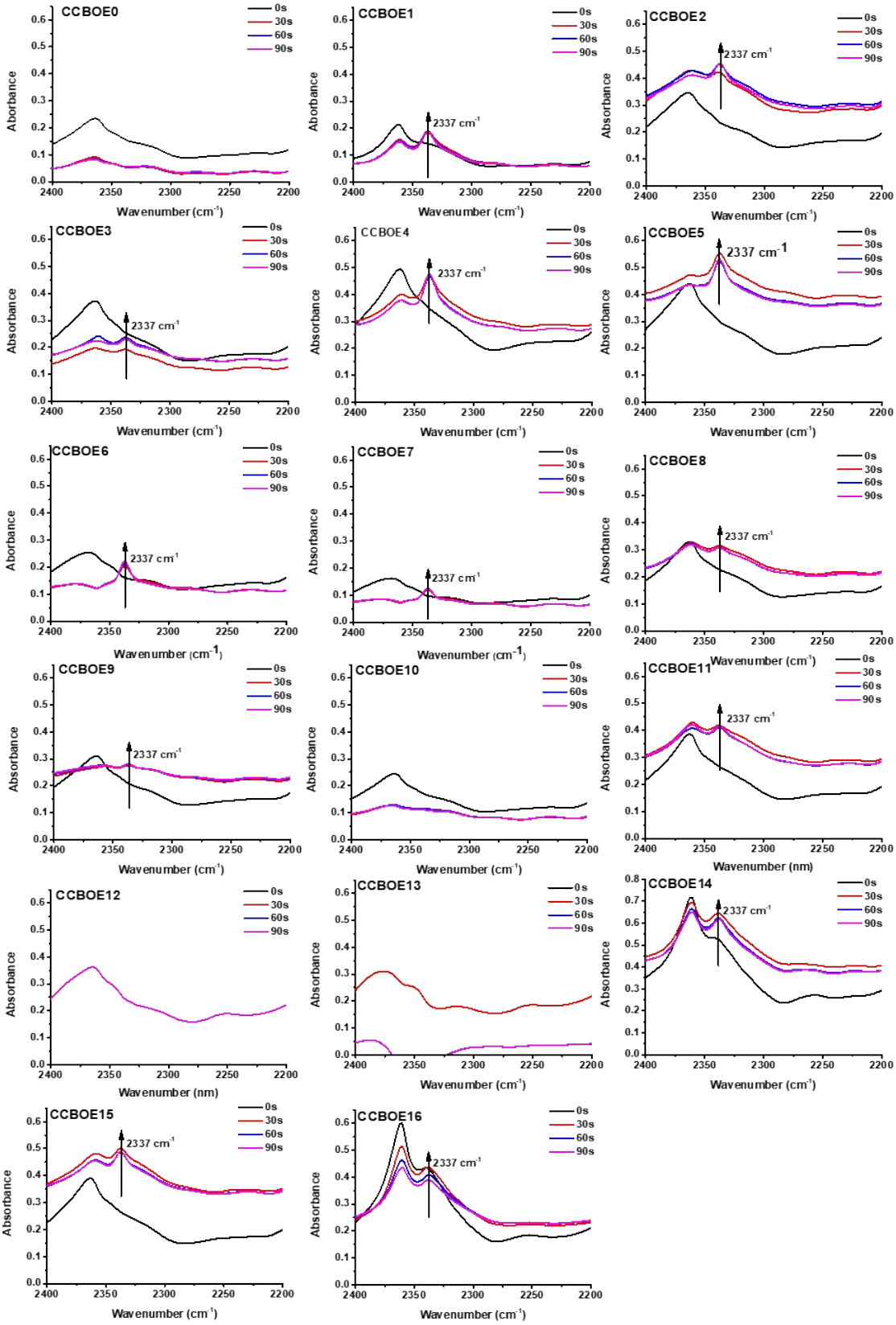


Figure S5. Infrared spectra of CCBOEs in TMPTA at t = 10 s, 30 s, 60 s and 90 s under 405 nm LED

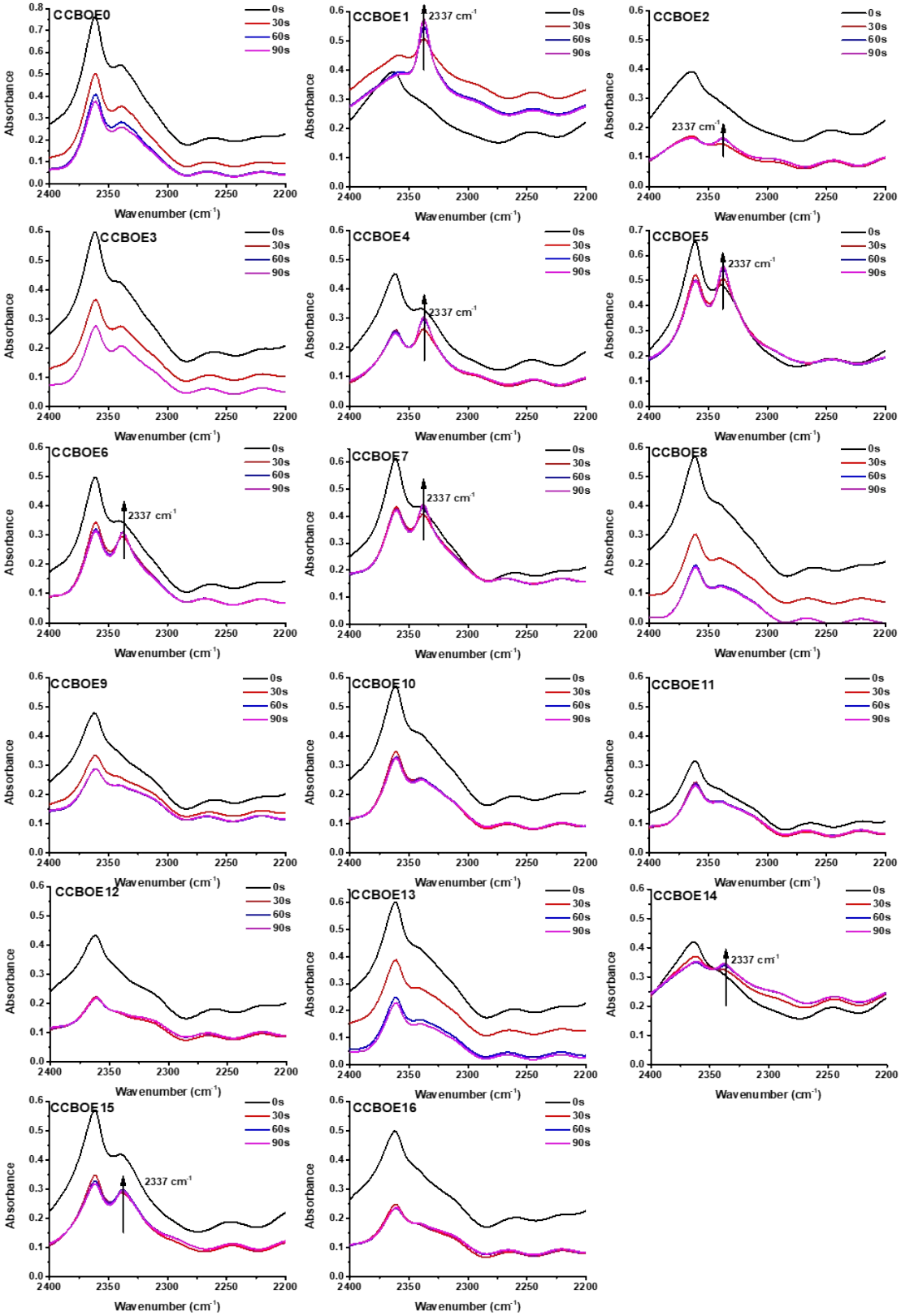


Figure S6. Infrared spectra of CCBOEs in TMPTA at t = 10 s, 30 s, 60 s and 90 s under 450 nm LED

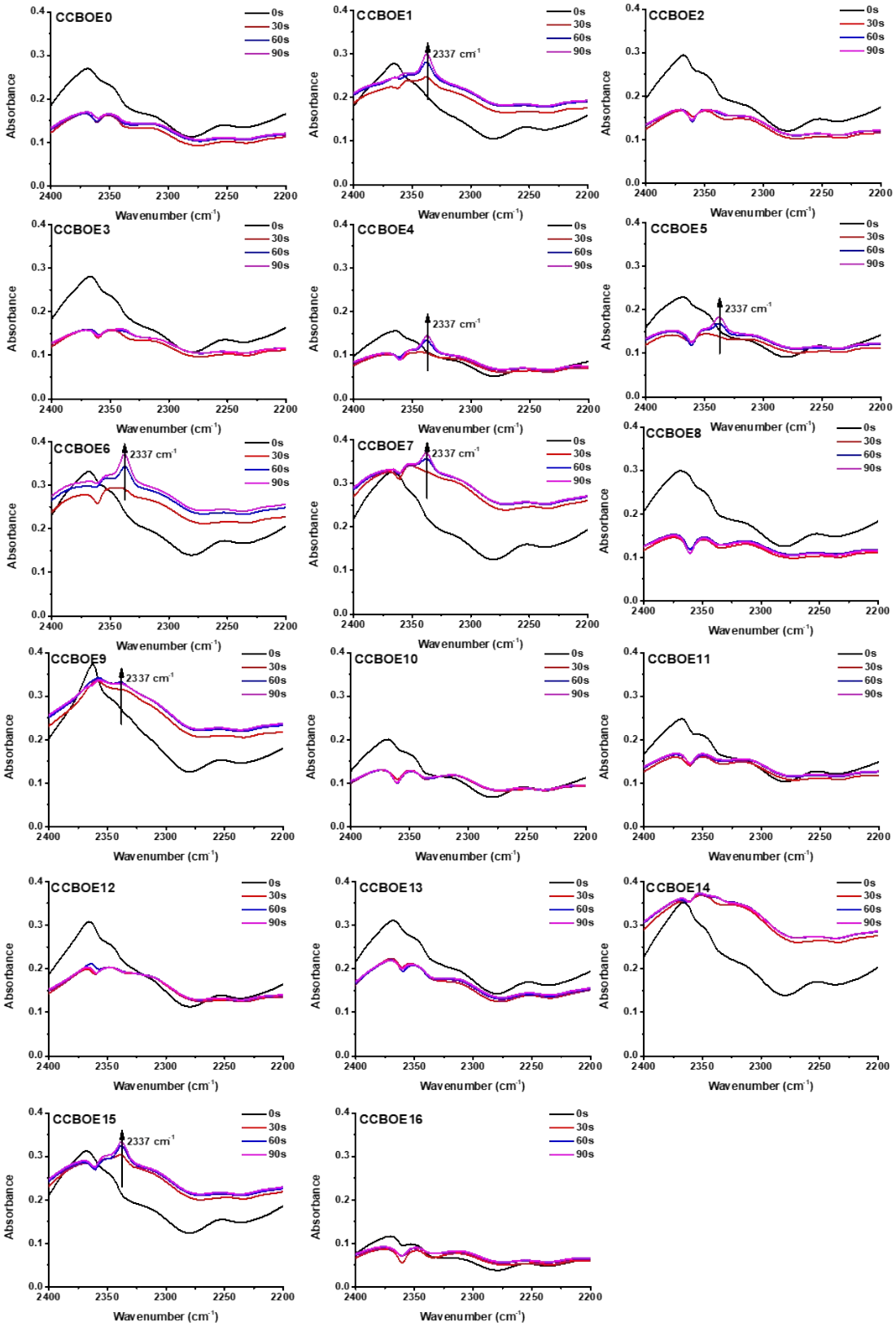
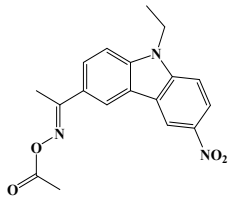
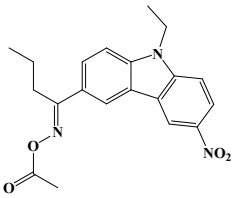
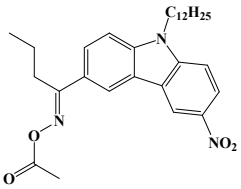
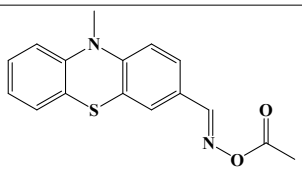
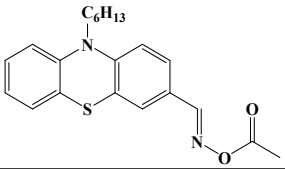
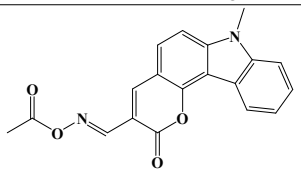
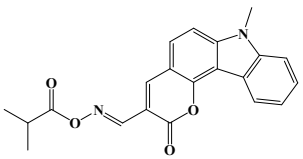
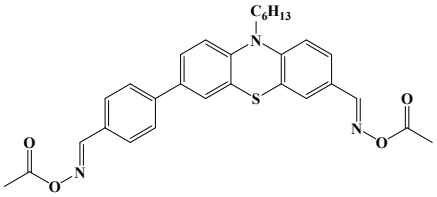


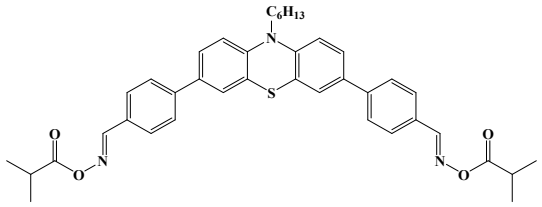
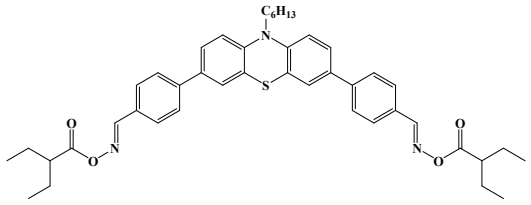
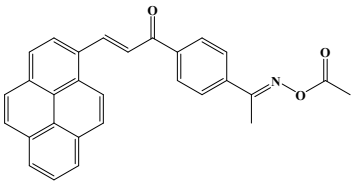
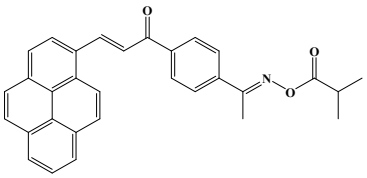
Figure S7. Infrared spectra of CCBOEs in TMPTA at t = 10 s, 30 s, 60 s and 90 s under 470 nm LED

Table S2. Parameters of thermal polymerization

CCBOEs	$T_{initial}$ (℃)	T_{max} (℃)	Conversion (%)
CCBOE0	101	222	54
CCBOE1	60	179	73
CCBOE3	75	173	66
CCBOE4	67	171	73
CCBOE5	83	173	81

Table S3. Parameters of reported OXEs' thermal polymerization

Structures of reported OXEs	Composition of the resins	$T_{initial}$ (℃)	Conversion (%)	References
	TMPTA/OXE 1 g : 2×10^{-5} mol	83	68	[1]
		97	68	
		82	71	
	TMPTA/OXE 1 g : 1 wt%	135	37	[2]
		125	36	
	TMPTA/OXE 1 g : 2×10^{-5} mol	90	60	[3]
		112	54	
	TMPTA/OXE 1 g : 1×10^{-5} mol	85	63	[4]

		84	51	
		99	49	
	TMPTA/OXE 1 g : 1×10^{-5} mol	141	8	[5]
		126	15	

References

1 S. Liu, N. Giacoletto, M. Schmitt, et al. Effect of decarboxylation on the photoinitiation behavior of nitrocarbazole-based oxime esters. Macromolecules, 2022, 55(7): 2475-2485.

2 A. Noon, F. Hammoud, B. Graff, et al. Photoinitiation Mechanisms of Novel Phenothiazine-Based Oxime and Oxime Esters Acting as Visible Light Sensitive Type I and Multicomponent Photoinitiators. Advanced Materials Technologies, 2023, 8(16): 2300205.

3 Y. Zhang, Z. Liu, T. Borjigin, et al. Carbazole-fused coumarin based oxime esters (OXEs): efficient photoinitiators for sunlight driven free radical photopolymerization. Green Chemistry, 2023, 25(17): 6881-6891.

4 Y. Zhang, F. Morlet-Savary, M. Schmitt, et al. Photoinitiation behavior of phenothiazines containing two oxime ester functionalities (OXEs) in free radical photopolymerization and 3D printing application. Dyes and Pigments, 2023, 215: 111202.

5 X. Zhang, Z. Liu, D. Zhu, et al. Photoinitiating Ability of Pyrene–Chalcone-Based Oxime Esters with Different Substituents. Macromolecular Chemistry and Physics, 2023, 224(20): 2300293.

General informations

All reagents and solvents were purchased from Aldrich or Alfa Aesar and used as received without further purification. Mass spectroscopy was performed by the Spectropole of Aix-Marseille University. ESI mass spectral analyses were recorded with a 3200 QTRAP (Applied Biosystems SCIEX) mass spectrometer. The HRMS mass spectral analysis was performed with a QStar Elite (Applied Biosystems SCIEX) mass spectrometer. Elemental analyses were recorded with a Thermo Finnigan EA 1112 elemental analysis apparatus driven by the Eager 300 software. ^{1}H and ^{13}C NMR spectra were determined at room temperature in 5 mm o.d. tubes on a Bruker Avance 400 or a Bruker Avance 300 spectrometer of the Spectropole: ^{1}H (400 MHz), ^{1}H (300 MHz), ^{13}C (100 MHz), and ^{13}C (75 MHz). All ^{1}H chemical shifts were referenced to the solvent peak $CDCl_3$ (7.26 ppm), DMSO-d_6 (2.49 ppm) and the ^{13}C chemical shifts were referenced to the solvent peak $CDCl_3$ (77.0 ppm).

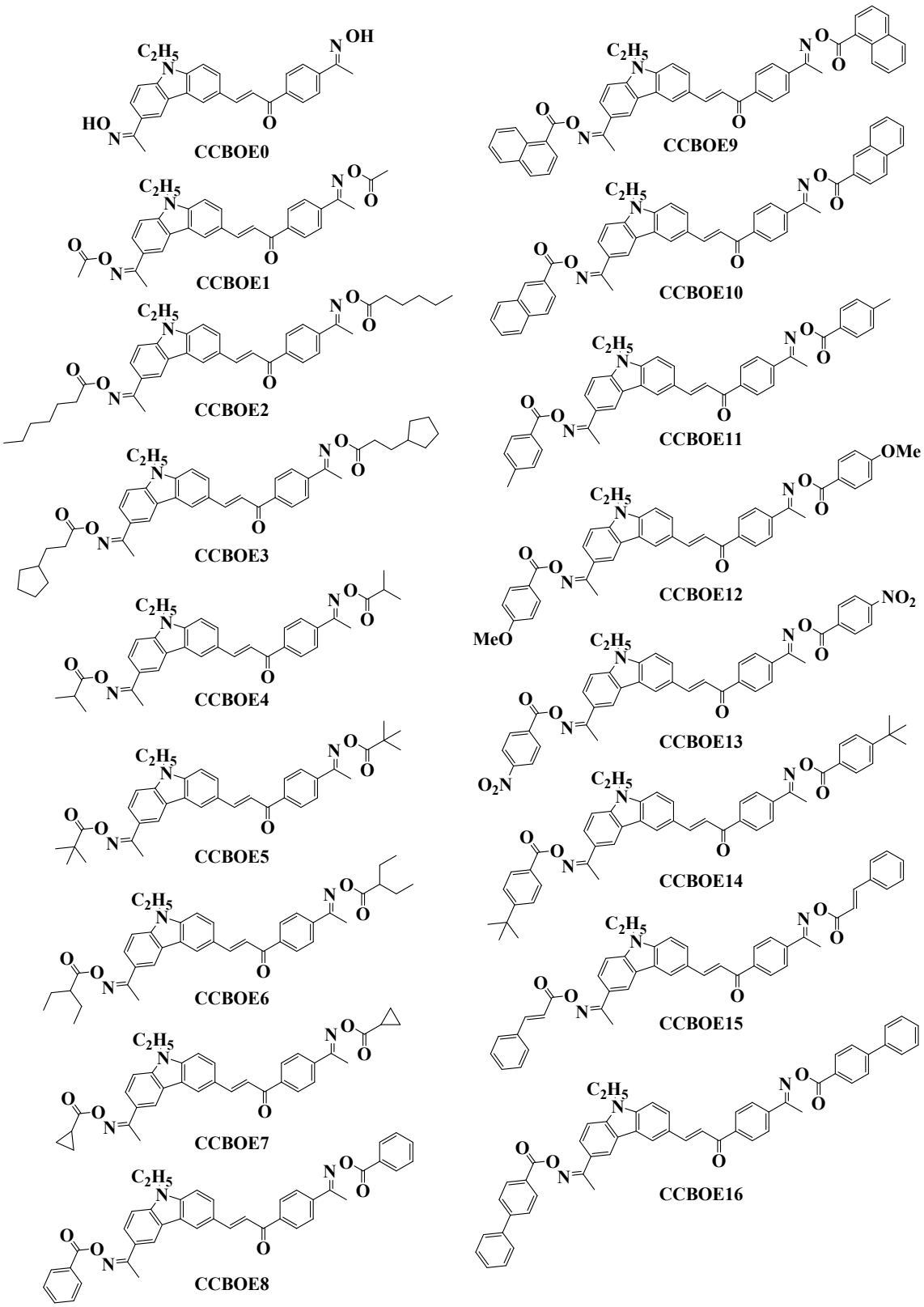
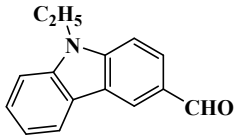


Figure S8. Chemical structures of investigated CCBOEs in this work.

Synthesis of 9-ethyl-9*H*-carbazole-3-carbaldehyde **C2**



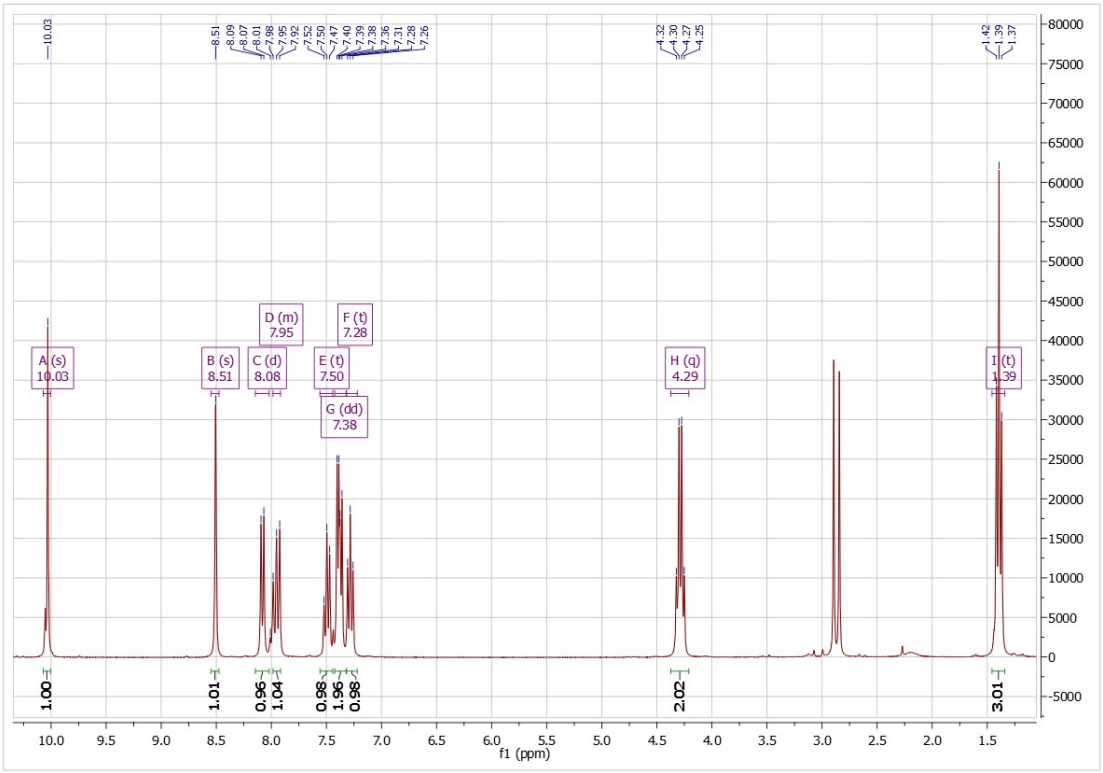
Chemical Formula: $C_{15}H_{13}NO$
Molecular Weight: 223,2750

To a stirred solution of anhydrous DMF (20.34 mL, 0.26 mol, M = 73.10 g/mol, d = 0.94 g/mL) and $POCl_3$ (20.35 mL, 0.22 mol, M = 153.32 g/mol, d = 1.64 g/mL), 9-ethyl-9*H*-carbazole (10 g, 51.21 mmol, M = 195.27 g/mol) in anhydrous chloroform (100 mL) was added dropwise at 0 °C, and the mixture was stirred for another 30 min at this temperature. Then, the reaction mixture was stirred at 75°C for 2 days. When the mixture was cooled down to room temperature, it was poured into ice/water by rapidly stirring the solution and by carefully neutralizing with 40% KOH. The solution was extracted with dichloromethane and dried over anhydrous $MgSO_4$. After evaporation of the volatiles, the crude product was obtained (10.56 g, 92.4% yield).

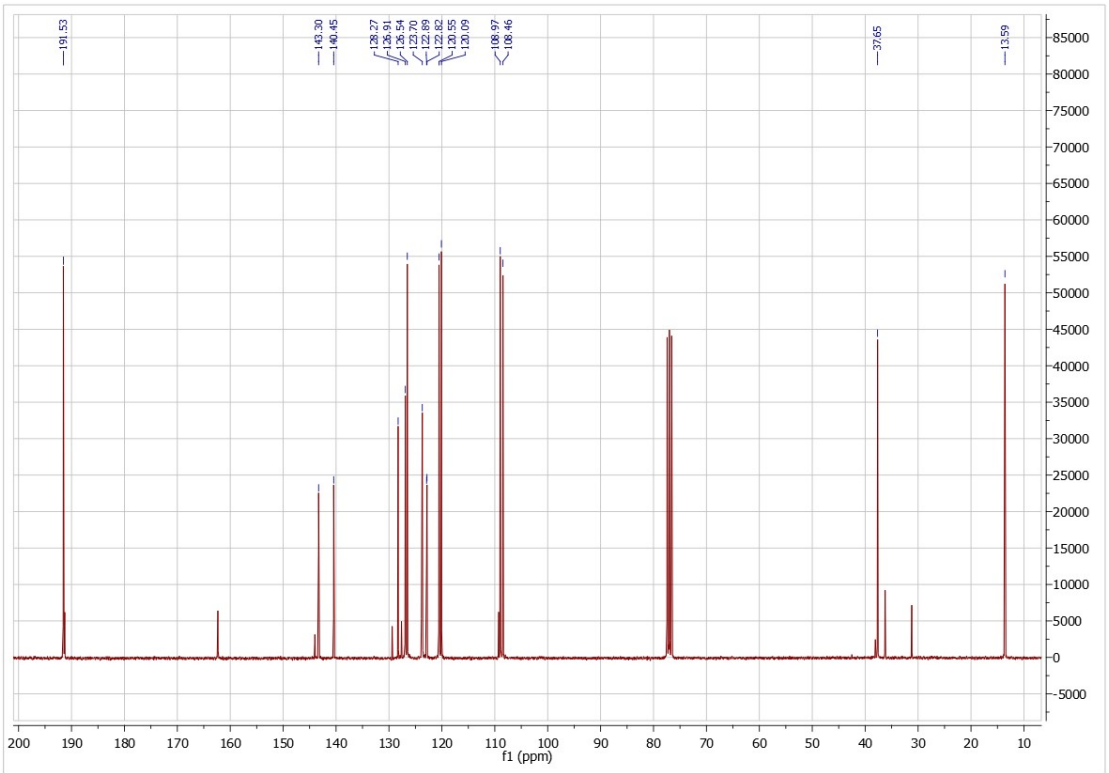
^{1}H NMR (300 MHz, $CDCl_3$) δ 10.03 (s, 1H), 8.51 (s, 1H), 8.08 (d, *J* = 7.7 Hz, 1H), 7.98 – 7.92 (m, 1H), 7.50 (t, *J* = 7.6 Hz, 1H), 7.38 (dd, *J* = 8.2, 5.2 Hz, 2H), 7.28 (t, *J* = 7.5 Hz, 1H), 4.29 (q, *J* = 7.2 Hz, 2H), 1.39 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 191.53 (s), 143.30 (s), 140.45 (s), 128.27 (s), 126.91 (s), 126.54 (s), 123.70 (s), 122.89 (s), 122.82 (s), 120.55 (s), 120.09 (s), 108.97 (s), 108.46 (s), 37.65 (s), 13.59 (s).

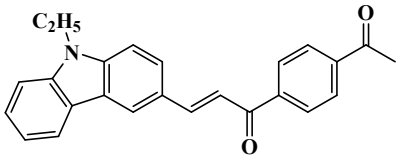
^{1}H NMR spectrum of 9-ethyl-9*H*-carbazole-3-carbaldehyde **C2**



^{13}C NMR spectrum of 4-hydroxy-9*H*-carbazole-3-carbaldehyde **C2**



Synthesis of (*E*)-1-(4-acetylphenyl)-3-(9-ethyl-9*H*-carbazol-3-yl)prop-2-en-1-one **C3**



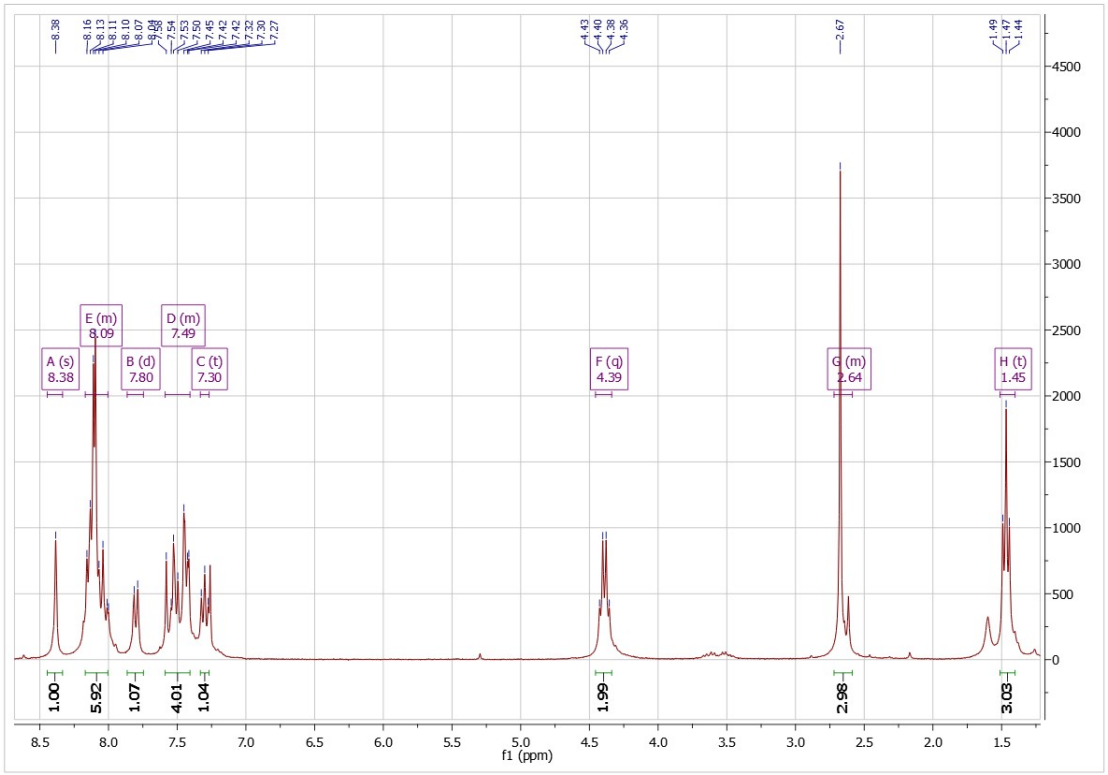
Chemical Formula: $C_{25}H_{21}NO_2$
Molecular Weight: 367,4480

9-Ethyl-9*H*-carbazole-3-carbaldehyde (5.03 g, 22.53 mmol, M = 223.28 g/mol) and 1,4-diacetylbenzene (3.65 g, 22.53 mmol, M = 162.19 g/mol) were dissolved in methanol (500 mL). Then, 2.5 M aq. KOH (165 mL) was added directly. After stirring for three days, the yellow precipitate that formed was filtered off. The crude product was washed with cold methanol, enabling to obtain the chalcone as a bright yellow solid (6.82 g, 89.2% yield).

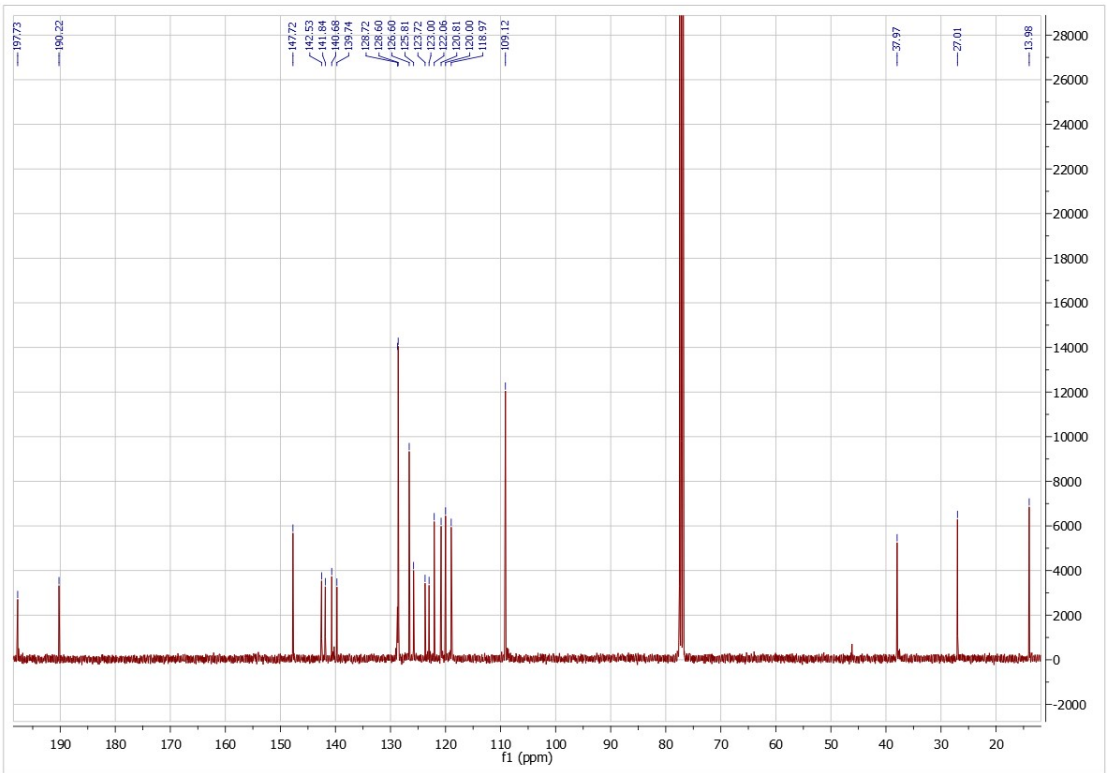
^{1}H NMR (300 MHz, $CDCl_3$) δ 8.38 (s, 1H), 8.17 – 8.00 (m, 6H), 7.80 (d, *J* = 7.7 Hz, 1H), 7.59 – 7.41 (m, 4H), 7.30 (t, 1H), 4.39 (q, *J* = 7.1 Hz, 2H), 2.72 – 2.59 (m, 3H), 1.45 (t, *J* = 9.7 Hz, 3H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 197.73 (s), 190.22 (s), 147.72 (s), 142.53 (s), 141.84 (s), 140.68 (s), 139.74 (s), 128.72 (s), 128.60 (s), 126.60 (s), 125.81 (s), 123.72 (s), 123.00 (s), 122.06 (s), 120.81 (s), 120.00 (s), 118.97 (s), 109.12 (s), 37.97 (s), 27.01 (s), 13.98 (s).

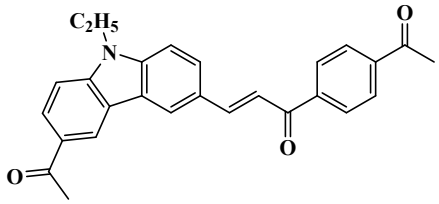
^{1}H NMR spectrum of (*E*)-1-(4-acetylphenyl)-3-(9-ethyl-9*H*-carbazol-3-yl)prop-2-en-1-one **C3**



^{13}C NMR spectrum of (*E*)-1-(4-acetylphenyl)-3-(9-ethyl-9*H*-carbazol-3-yl)prop-2-en-1-one **C3**



Synthesis of (*E*)-3-(6-acetyl-9-ethyl-9*H*-carbazol-3-yl)-1-(4-acetylphenyl)prop-2-en-1-one **C4**



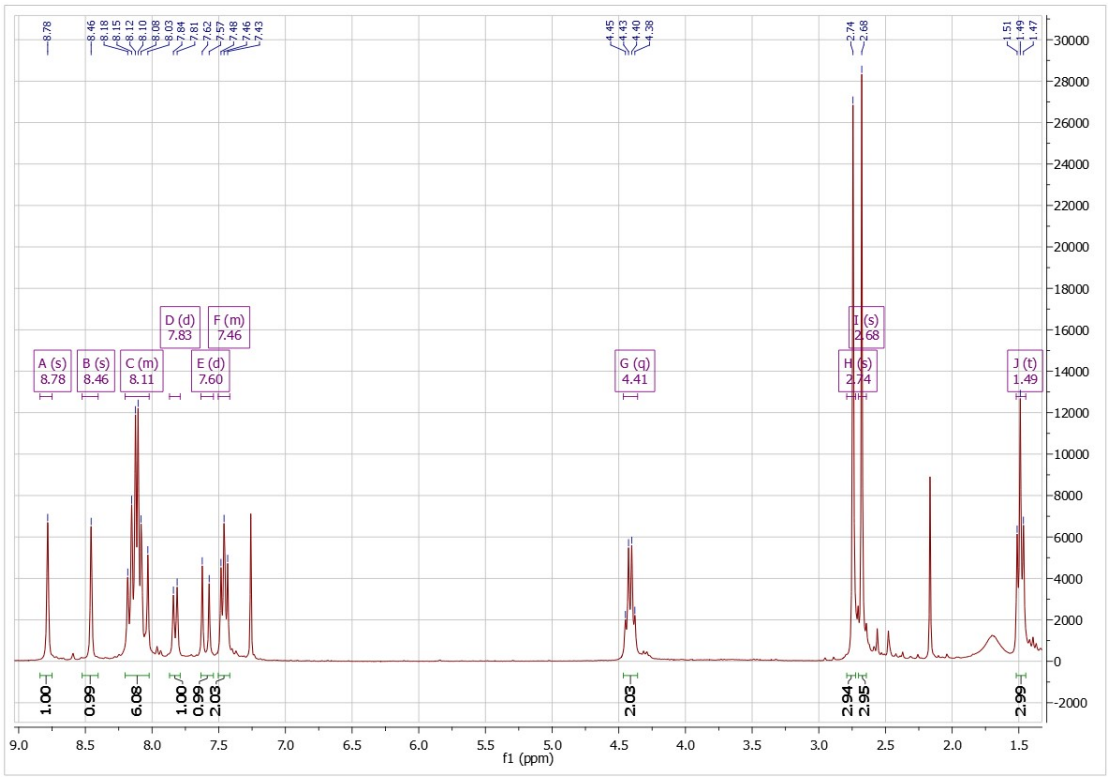
Chemical Formula: $C_{27}H_{23}NO_3$
Molecular Weight: 409,4850

(*E*)-1-(4-Acetylphenyl)-3-(9-ethyl-9*H*-carbazol-3-yl)prop-2-en-1-one (6.8 g, 18.51 mmol, M = 367.45 g/mol) was dissolved in anhydrous dichloromethane (400 mL). Then, aluminum trichloride (24.67 g, 185.06 mmol, M = 133.33 g/mol) and acetyl chloride (13.16 mL, 185.06 mmol, M = 78.50 g/mol, d = 1.10 g/mL) were added successively into the mixture at 0-5°C. After stirring the solution overnight at room temperature, the organic phase was washed with water and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (7.25 g, 95.7% yield).

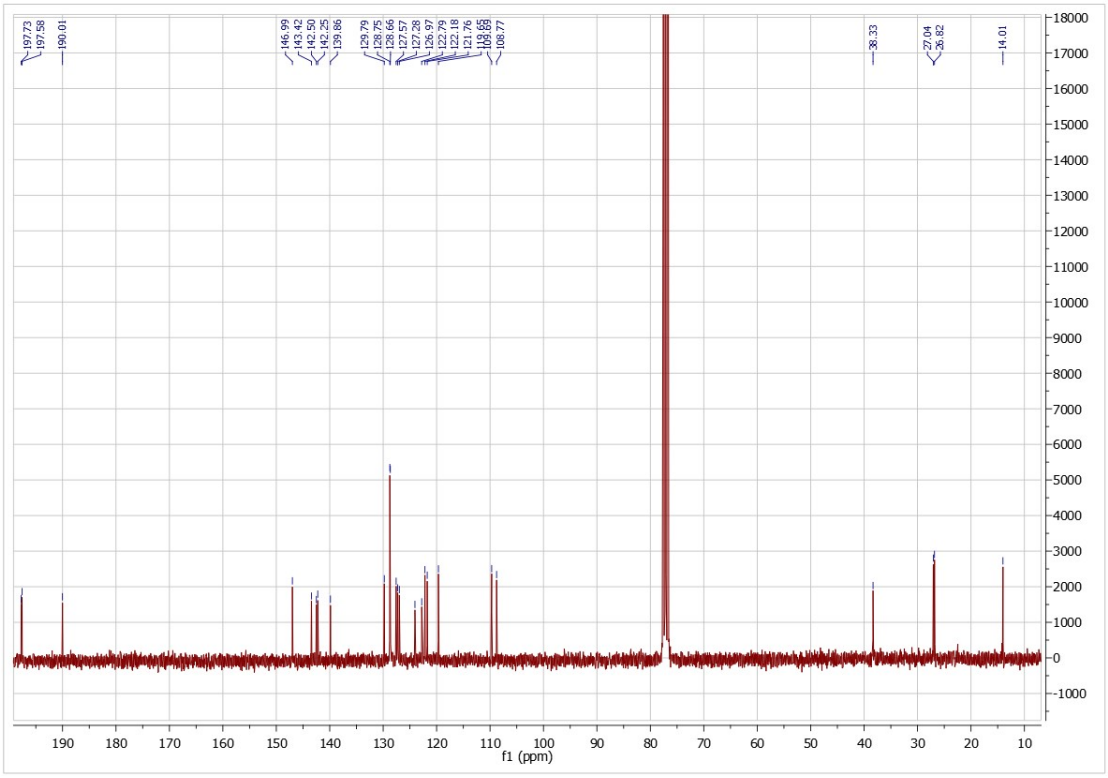
^{1}H NMR (300 MHz, $CDCl_3$) δ 8.78 (s, 1H), 8.46 (s, 1H), 8.20 – 8.02 (m, 6H), 7.83 (d, *J* = 8.4 Hz, 1H), 7.60 (d, *J* = 15.6 Hz, 1H), 7.50 – 7.42 (m, 2H), 4.41 (q, *J* = 7.0 Hz, 2H), 2.74 (s, 3H), 2.68 (s, 3H), 1.49 (t, *J* = 7.1 Hz, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 197.73 (s), 197.58 (s), 190.01 (s), 146.99 (s), 143.42 (s), 142.50 (s), 142.25 (s), 139.86 (s), 129.79 (s), 128.75 (s), 128.66 (s), 127.57 (s), 127.28 (s), 126.97 (s), 124.05 (s), 122.79 (s), 122.18 (s), 121.76 (s), 119.65 (s), 109.69 (s), 108.77 (s), 38.33 (s), 27.04 (s), 26.82 (s), 14.01 (s).

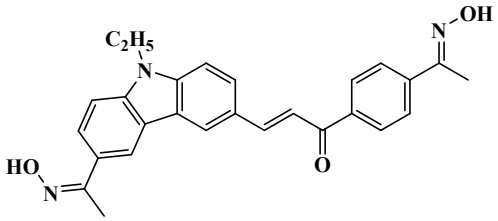
^{1}H NMR spectrum of (*E*)-3-(6-acetyl-9-ethyl-9*H*-carbazol-3-yl)-1-(4-acetylphenyl)prop-2-en-1-one **C4**



^{13}C NMR spectrum of (*E*)-3-(6-acetyl-9-ethyl-9*H*-carbazol-3-yl)-1-(4-acetylphenyl)prop-2-en-1-one **C4**



Synthesis of (*E*)-3-(9-ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino)ethyl)phenyl)prop-2-en-1-one **CCBOE0**



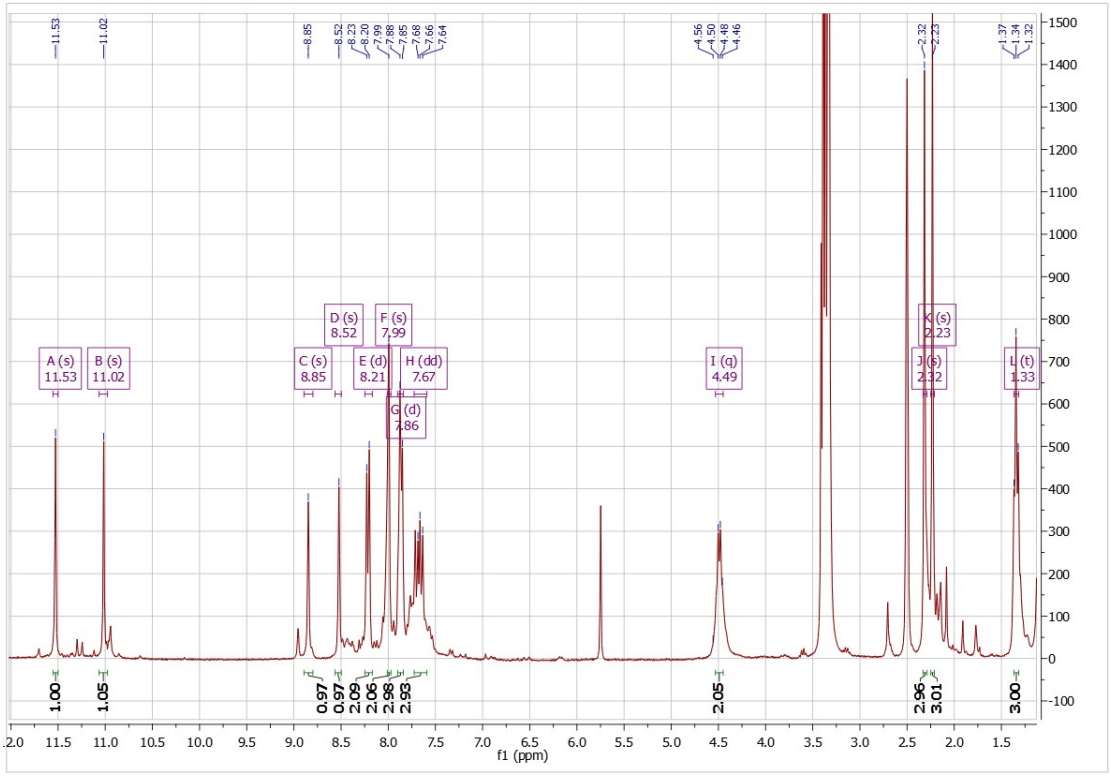
Chemical Formula: $C_{27}H_{25}N_3O_3$
Molecular Weight: 439,5150

A mixture of (*E*)-3-(6-acetyl-9-ethyl-9*H*-carbazol-3-yl)-1-(4-acetylphenyl)prop-2-en-1-one (7.20 g, 17.58 mmol, M = 409.49 g/mol), hydroxylamine hydrochloride (2.44 g, 17.58 mmol, M = 69.49 g/mol) and sodium acetate (4.79 g, 17.58 mmol, M = 136.08 g/mol) was refluxed in THF/Methanol/Water (400 mL/40 mL/40 mL) overnight. The solvent was evaporated under reduced pressure, and the residue was washed with water. The raw product was recrystallized from dichloromethane/ether to give the product as an orange powder (7.54 g, 97.6% yield).

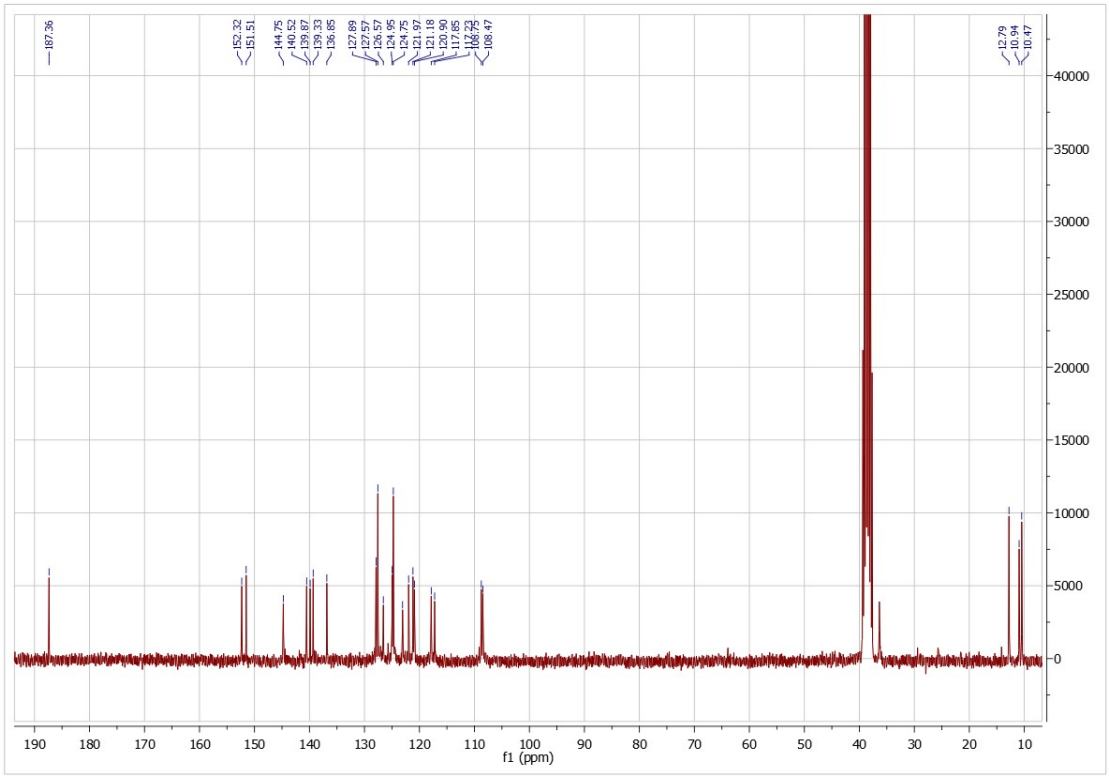
^{1}H NMR (300 MHz, DMSO-d_6) δ 11.53 (s, 1H), 11.02 (s, 1H), 8.85 (s, 1H), 8.52 (s, 1H), 8.21 (d, *J* = 8.1 Hz, 2H), 7.99 (s, 2H), 7.86 (d, *J* = 7.7 Hz, 3H), 7.67 (dd, *J* = 14.9, 8.7 Hz, 3H), 4.49 (q, *J* = 6.8 Hz, 2H), 2.32 (s, 3H), 2.23 (s, 3H), 1.33 (t, *J* = 6.9 Hz, 3H).

^{13}C NMR (75 MHz, DMSO-d_6) δ 187.36 (s), 152.32 (s), 151.51 (s), 144.75 (s), 140.52 (s), 139.87 (s), 139.33 (s), 136.85 (s), 127.89 (s), 127.57 (s), 126.57 (s), 124.95 (s), 124.75(s), 123.07 (s), 121.97 (s), 121.18 (s), 120.90 (s), 117.85 (s), 117.23 (s), 108.75 (s), 108.47 (s), 126.57 (s), 12.79 (s), 10.94 (s), 10.47 (s).

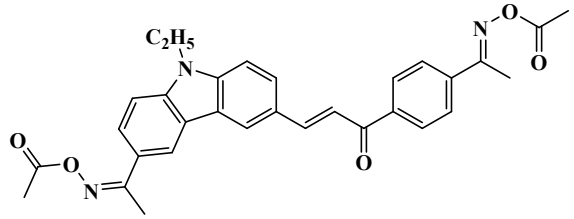
^{1}H NMR spectrum of (*E*)-3-(9-ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino)ethyl)phenyl)prop-2-en-1-one **CCBOE0**



^{13}C NMR spectrum of (*E*)-3-(9-ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino)ethyl)phenyl)prop-2-en-1-one **CCBOE0**



Synthesis of (*E*)-3-(6-((*Z*)-1-(acetoxyimino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(acetoxyimino)ethyl)phenyl)prop-2-en-1-one **CCBOE1**



Chemical Formula: $C_{31}H_{29}N_3O_5$
Molecular Weight: 523,5890

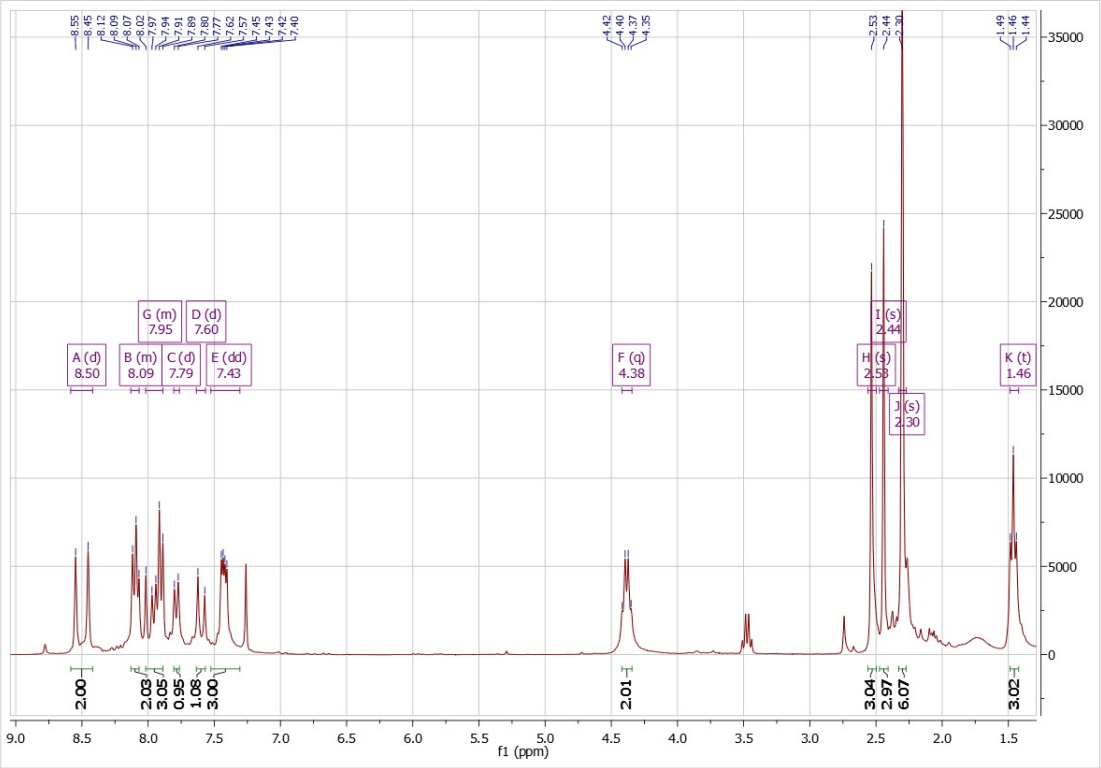
(*E*)-3-(9-Ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino) ethyl)phenyl)prop-2-en-1-one (0.3 g, 0.68 mmol, M = 439.52 g/mol) and triethylamine (1.14 mL, 8.19 mmol, M = 101.19 g/mol, d = 0.726 g/mL) were dissolved in anhydrous dichloromethane (50 mL). Then, acetyl chloride (0.11 mL, 1.50 mmol, M = 78.50 g/mol, d = 1.10 g/mL) was added directly. The flask was then stirred at room temperature overnight. The solution was subsequently washed with 6 M aq. HCl and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (0.28 g, 78.4% yield).

^{1}H NMR (300 MHz, $CDCl_3$) δ 8.50 (d, *J* = 28.3 Hz, 2H), 8.13 – 8.07 (m, 2H), 8.02 – 7.89 (m, 3H), 7.79 (d, *J* = 8.6 Hz, 1H), 7.60 (d, *J* = 15.6 Hz, 1H), 7.43 (dd, *J* = 8.3, 4.2 Hz, 3H), 4.38 (q, *J* = 6.5 Hz, 2H), 2.53 (s, 3H), 2.44 (s, 3H), 2.30 (s, 6H), 1.46 (t, *J* = 6.9 Hz, 3H).

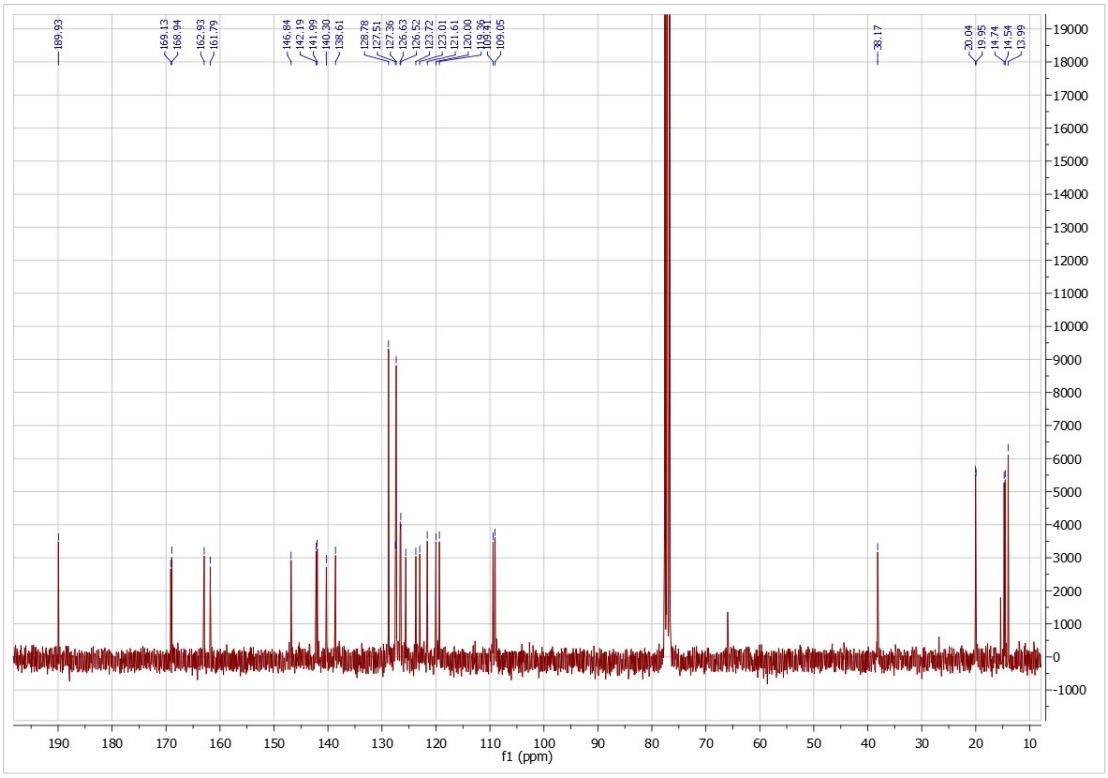
^{13}C NMR (75 MHz, $CDCl_3$) δ 189.93 (s), 169.13 (s), 168.94 (s), 162.93 (s), 161.79 (s), 146.84 (s), 142.19 (s), 141.99 (s), 140.30 (s), 138.61 (s), 128.78 (s), 127.51 (s), 127.36 (s), 126.63 (s), 126.52 (s), 125.59 (s), 123.72 (s), 123.01 (s), 121.61 (s), 120.00 (s), 119.36 (s), 109.41 (s), 109.05 (s), 38.17 (s), 20.04 (s), 19.95 (s), 14.74 (s), 14.52 (s), 13.99 (s).

HRMS (ESI MS) m/z: theor: 523.5890 found: 524.2107 ($[M+H]^+$ detected)

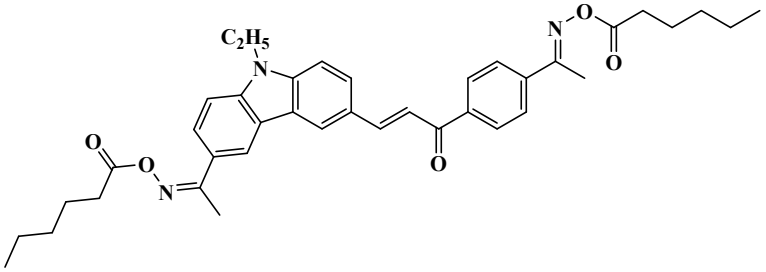
^{1}H NMR spectrum of (*E*)-3-(6-((*Z*)-1-(acetoxyimino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(acetoxyimino)ethyl)phenyl)prop-2-en-1-one **CCBOE1**



^{13}C NMR spectrum of (*E*)-3-(6-((*Z*)-1-(acetoxyimino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(acetoxyimino)ethyl)phenyl)prop-2-en-1-one **CCBOE1**



Synthesis of 1-((((*Z*)-1-(9-ethyl-6-((*E*)-3-(4-((*E*)-1-((hexanoyloxy)imino)ethyl)phenyl)-3-oxoprop-1-en-1-yl)-9*H*-carbazol-3-yl)ethylidene)amino)oxy)hexan-1-one **CCBOE2**



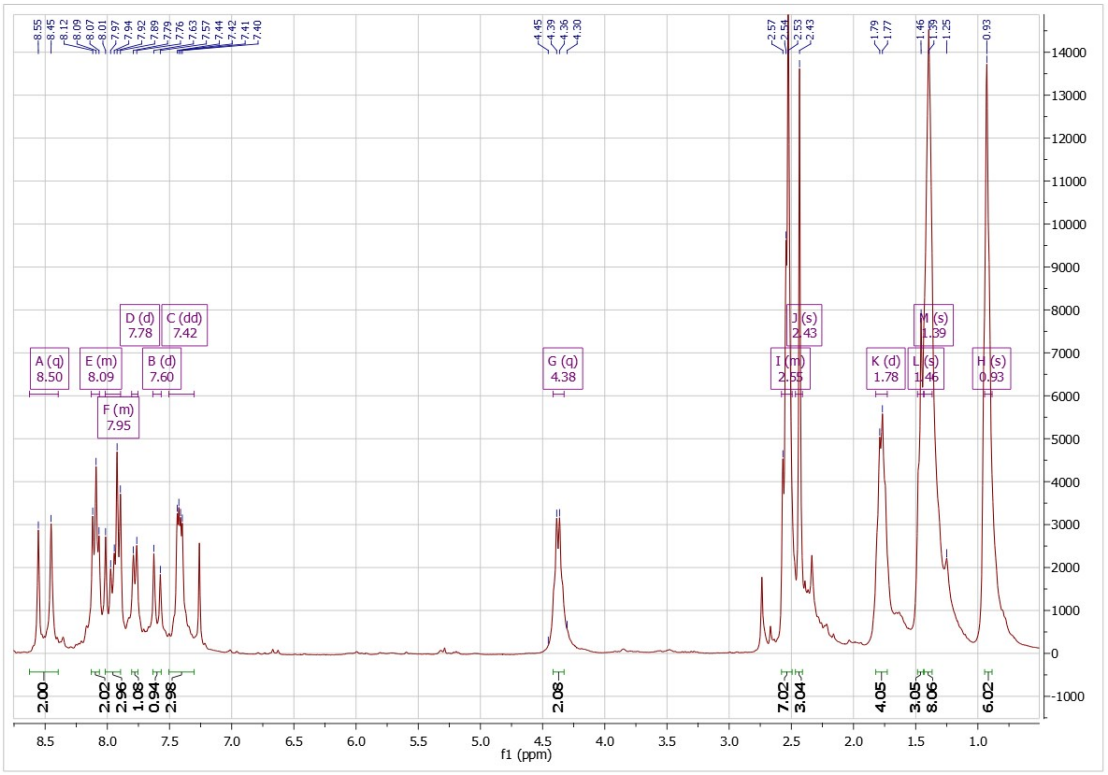
Chemical Formula: $C_{39}H_{45}N_3O_5$
Molecular Weight: 635,8050

(*E*)-3-(9-Ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino) ethyl)phenyl)prop-2-en-1-one (0.3 g, 0.68 mmol, M = 439.52 g/mol) and triethylamine (1.14 mL, 8.19 mmol, M = 101.19 g/mol, d = 0.726 g/mL) were dissolved in anhydrous dichloromethane (50 mL). Then, hexanoyl chloride (0.21 mL, 1.50 mmol, M = 134.60 g/mol, d = 0.96 g/mL) was added directly. The flask was then stirred at room temperature overnight. The solution was subsequently washed with 6 M aq. HCl and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (0.38 g, 87.6% yield).

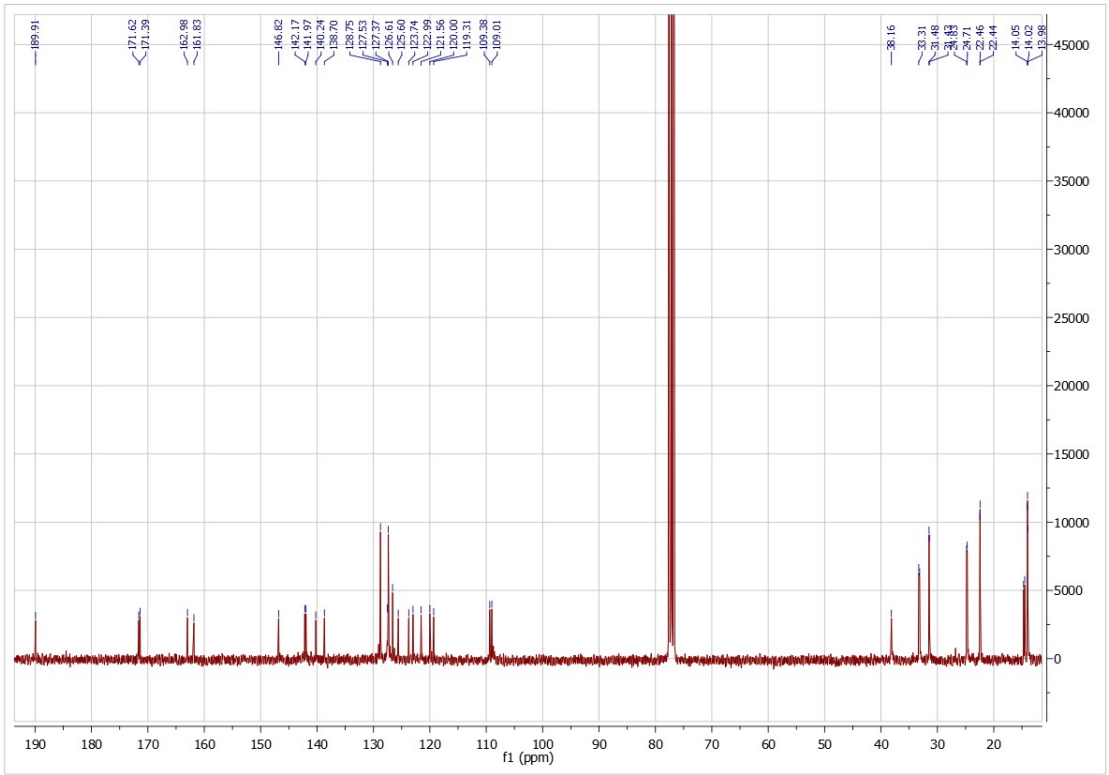
^{1}H NMR (300 MHz, $CDCl_3$) δ 8.50 (d, *J* = 30.7 Hz, 2H), 8.13 – 8.06 (m, 2H), 8.02 – 7.89 (m, 3H), 7.78 (d, *J* = 8.2 Hz, 1H), 7.60 (d, *J* = 15.5 Hz, 1H), 7.42 (dd, *J* = 8.2, 4.0 Hz, 3H), 4.38 (q, *J* = 6.9 Hz, 2H), 2.58 – 2.49 (m, 7H), 2.43 (s, 3H), 1.78 (d, *J* = 6.4 Hz, 4H), 1.46 (s, 3H), 1.39 (s, 8H), 0.93 (s, 6H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.91 (s), 171.62 (s), 171.39 (s), 162.98 (s), 161.83 (s), 146.82 (s), 142.17 (s), 141.97 (s), 140.24 (s), 138.70 (s), 128.75 (s), 127.53 (s), 127.37 (s), 126.61 (s), 125.60 (s), 123.74 (s), 122.99 (s), 121.56 (s), 120.00 (s), 119.31 (s), 109.38 (s), 109.01 (s), 38.16 (s), 33.31 (s), 33.15 (s), 31.48 (s), 31.43 (s), 24.83 (s), 24.71 (s), 22.46 (s), 22.42 (s), 14.72 (s), 14.52 (s), 14.05 (s), 14.02 (s), 13.98 (s).

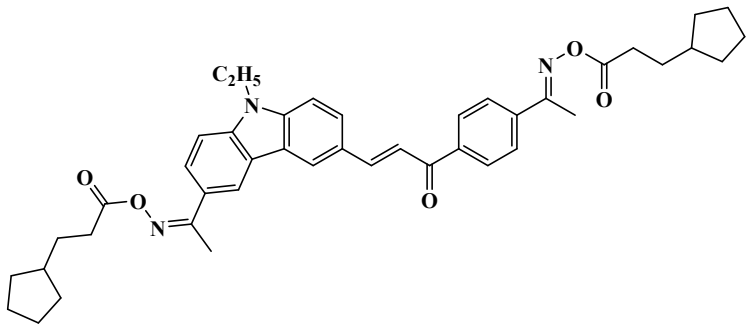
^{1}H NMR spectrum of 1-((((*Z*)-1-(9-ethyl-6-((*E*)-3-(4-((*E*)-1-((hexanoyloxy)imino) ethyl)phenyl)-3-oxoprop-1-en-1-yl)-9*H*-carbazol-3-yl)ethylidene)amino)oxy)hexan-1-one **CCBOE2**



^{13}C NMR spectrum of 1-((((*Z*)-1-(9-ethyl-6-((*E*)-3-(4-((*E*)-1-((hexanoyloxy)imino) ethyl)phenyl)-3-oxoprop-1-en-1-yl)-9*H*-carbazol-3-yl)ethylidene)amino)oxy)hexan-1-one **CCBOE2**



Synthesis of (*E*)-3-(6-((*Z*)-1-(((3-cyclopentylpropanoyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((3-cyclopentylpropanoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE3**



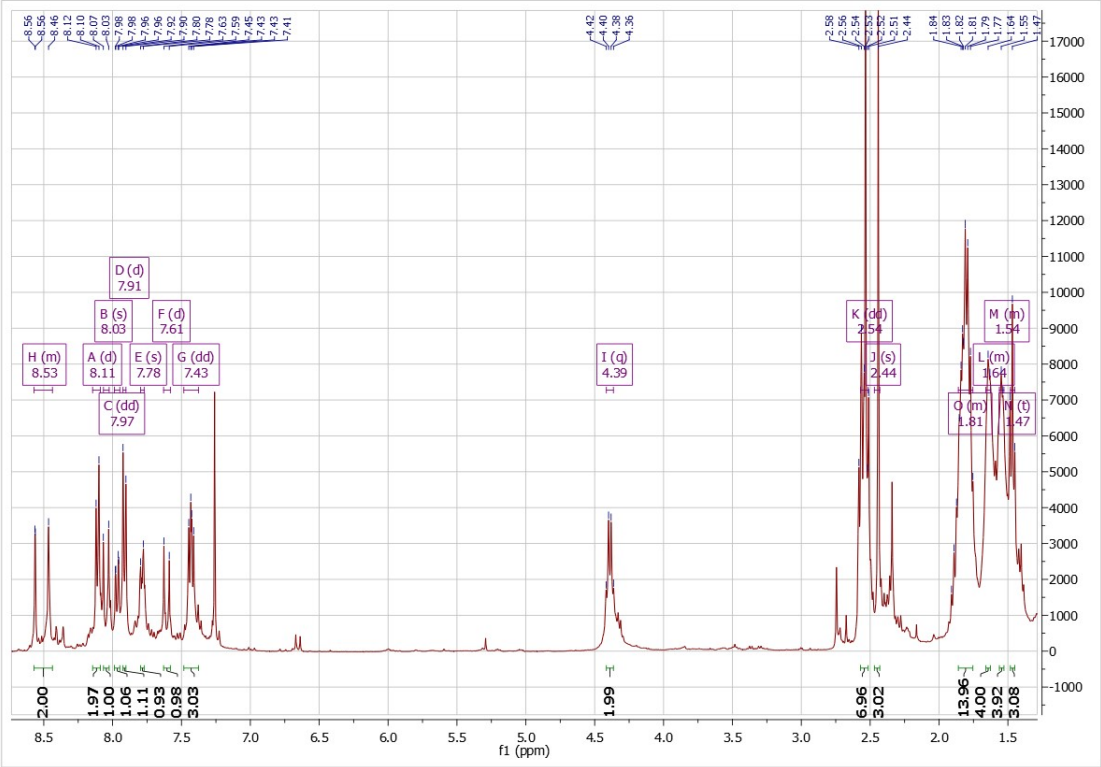
Chemical Formula: $C_{43}H_{49}N_3O_5$
Molecular Weight: 687,8810

(*E*)-3-(9-Ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino) ethyl)phenyl)prop-2-en-1-one (0.3 g, 0.68 mmol, M = 439.52 g/mol) and triethylamine (1.14 mL, 8.19 mmol, M = 101.19 g/mol, d = 0.726 g/mL) were dissolved in anhydrous dichloromethane (50 mL). Then, 3-cyclopentylpropanoyl chloride (0.23 mL, 1.50 mmol, M = 160.64 g/mol, d = 1.05 g/mL) was added directly. The flask was then stirred at room temperature overnight. The solution was subsequently washed with 6 M aq. HCl and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (0.41 g, 87.3% yield).

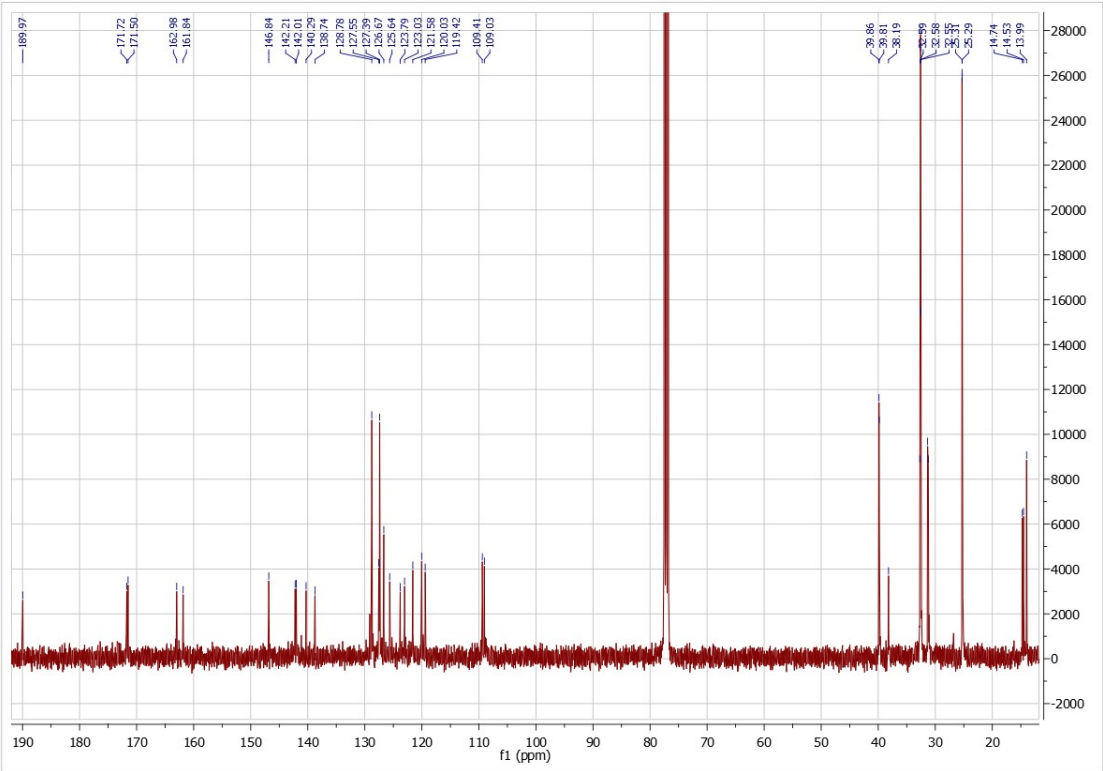
^{1}H NMR (400 MHz, $CDCl_3$) δ 8.57 – 8.44 (m, 2H), 8.11 (d, *J* = 8.3 Hz, 2H), 8.03 (s, 1H), 7.97 (dd, *J* = 8.6, 1.4 Hz, 1H), 7.91 (d, *J* = 8.3 Hz, 1H), 7.78 (s, 1H), 7.61 (d, *J* = 15.5 Hz, 1H), 7.43 (dd, *J* = 8.5, 5.8 Hz, 3H), 4.39 (q, *J* = 7.3 Hz, 2H), 2.54 (dd, *J* = 10.7, 6.7 Hz, 7H), 2.44 (s, 3H), 1.81 (m, 14H), 1.64 (m, 4H), 1.54 (m, 4H), 1.47 (t, *J* = 6.9 Hz, 3H).

^{13}C NMR (101 MHz, CDCl3) δ 189.97 (s), 171.72 (s), 171.50 (s), 162.98 (s), 161.84 (s), 146.84 (s), 142.21 (s), 142.01 (s), 140.29 (s), 138.74 (s), 128.78 (s), 127.55 (s), 127.39 (s), 126.67 (s), 125.64 (s), 123.79 (s), 123.03 (s), 121.58 (s), 120.03 (s), 121.58 (s), 120.03 (s), 119.42 (s), 109.41 (s), 109.03 (s), 39.86 (s), 39.81 (s), 38.19 (s), 32.70 (s), 32.59 (s), 32.58 (s), 32.55 (s), 31.34 (s), 31.23 (s), 25.31 (s), 25.29 (s), 14.74 (s), 14.53 (s), 13.99 (s).

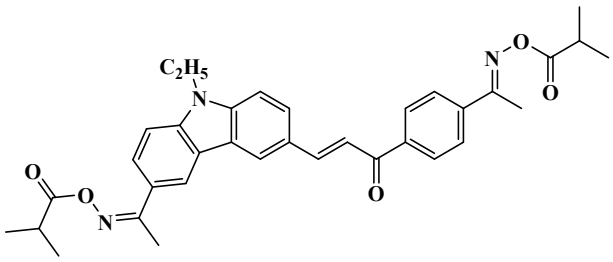
^{1}H NMR spectrum of (*E*)-3-(6-((*Z*)-1-(((3-cyclopentylpropanoyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((3-cyclopentylpropanoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE3**



^{13}C NMR spectrum of (*E*)-3-(6-((*Z*)-1-(((3-cyclopentylpropanoyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((3-cyclopentylpropanoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE3**



Synthesis of (*E*)-3-(9-ethyl-6-((*Z*)-1-((isobutyryloxy)imino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-((isobutyryloxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE4**



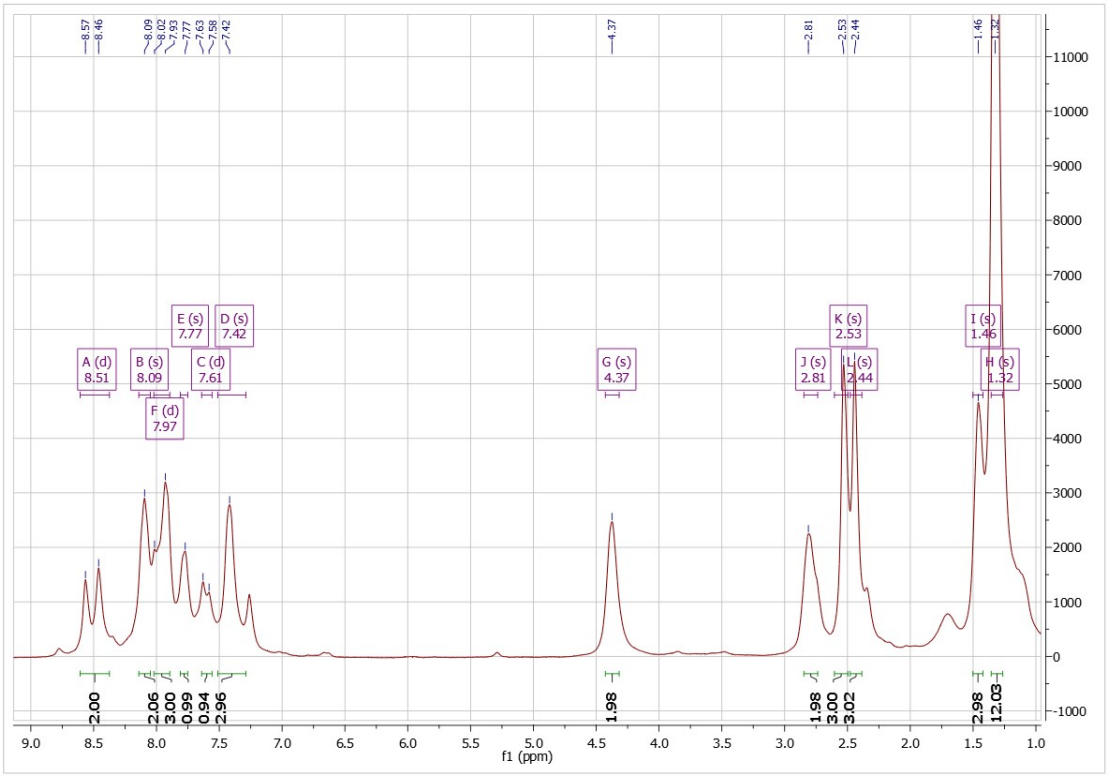
Chemical Formula: $C_{35}H_{37}N_3O_5$
Molecular Weight: 579,6970

(*E*)-3-(9-Ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino) ethyl)phenyl)prop-2-en-1-one (0.3 g, 0.68 mmol, M = 439.52 g/mol) and triethylamine (1.14 mL, 8.19 mmol, M = 101.19 g/mol, d = 0.726 g/mL) were dissolved in anhydrous dichloromethane (50 mL). Then, isobutyryl chloride (0.16 mL, 1.50 mmol, M = 106.55 g/mol, d = 1.02 g/mL) was added directly. The flask was then stirred at room temperature overnight. The solution was subsequently washed with 6 M aq. HCl and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (0.36 g, 91.0% yield).

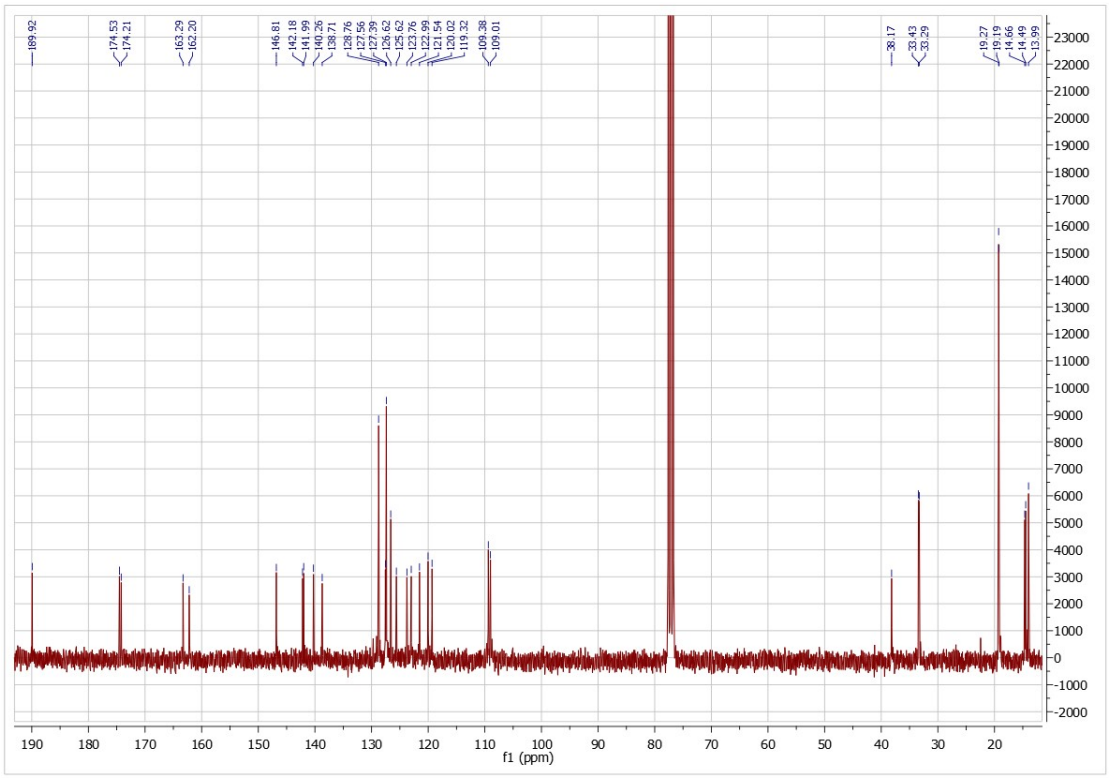
^{1}H NMR (300 MHz, $CDCl_3$) δ 8.51 (d, *J* = 31.5 Hz, 2H), 8.09 (s, 2H), 7.97 (d, *J* = 25.8 Hz, 3H), 7.77 (s, 1H), 7.61 (d, *J* = 14.4 Hz, 1H), 7.42 (s, 3H), 4.37 (s, 2H), 2.81 (s, 2H), 2.53 (s, 3H), 2.44 (s, 3H), 1.46 (s, 3H), 1.32 (s, 12H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.92 (s), 174.53 (s), 174.21 (s), 163.29 (s), 162.20 (s), 146.81 (s), 142.18 (s), 141.99 (s), 140.26 (s), 138.71 (s), 128.76 (s), 127.56 (s), 127.39 (s), 126.62 (s), 125.62 (s), 123.76 (s), 122.99 (s), 121.54 (s), 120.02 (s), 119.32 (s), 109.38 (s), 109.01 (s), 38.17 (s), 33.43 (s), 33.29 (s), 19.27 (s), 19.19 (s), 14.66 (s), 14.49 (s), 13.99 (s).

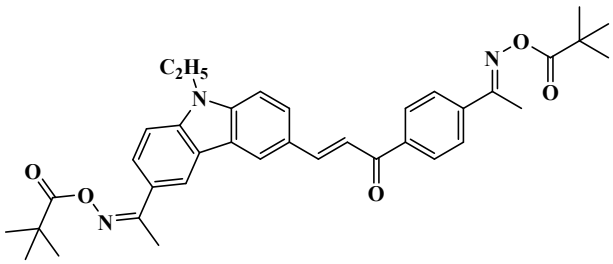
^{1}H NMR spectrum of (*E*)-3-(9-ethyl-6-((*Z*)-1-((isobutyryloxy)imino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-((isobutyryloxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE4**



^{13}C NMR spectrum of (*E*)-3-(9-ethyl-6-((*Z*)-1-((isobutyryloxy)imino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-((isobutyryloxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE4**



Synthesis of (*E*)-3-(9-ethyl-6-((*Z*)-1-((pivaloyloxy)imino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-((pivaloyloxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE5**



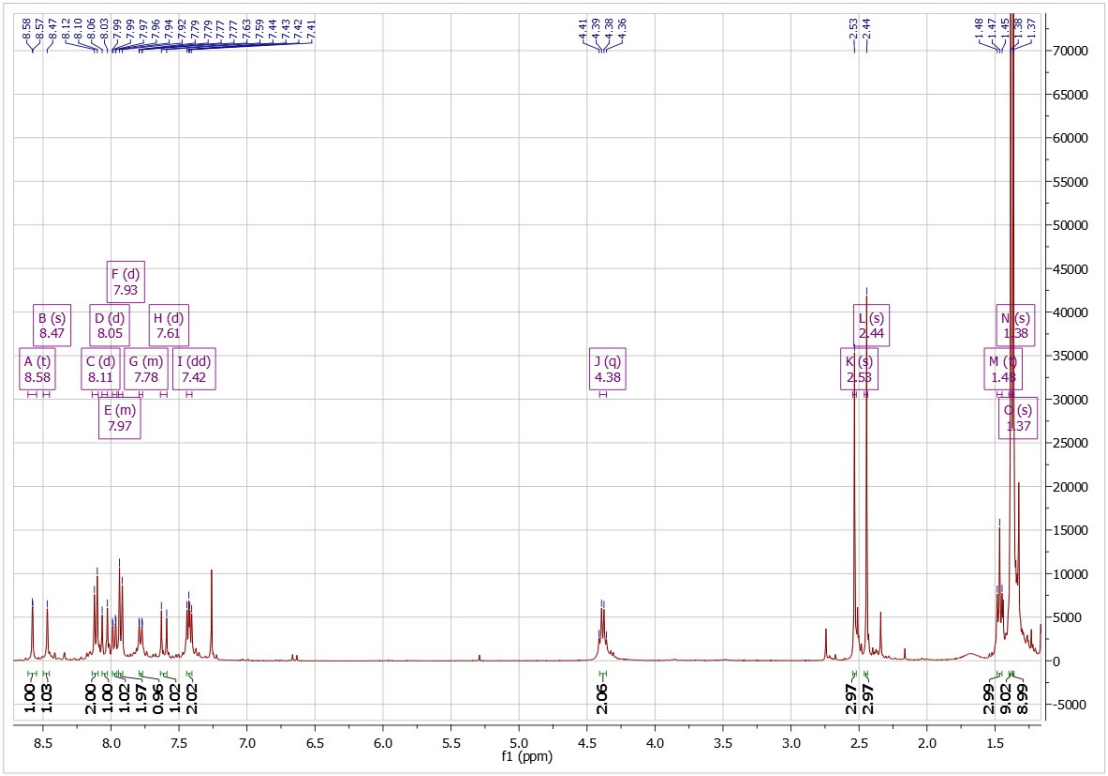
Chemical Formula: $C_{37}H_{41}N_3O_5$
Molecular Weight: 607,7510

(*E*)-3-(9-Ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino) ethyl)phenyl)prop-2-en-1-one (0.3 g, 0.68 mmol, M = 439.52 g/mol) and triethylamine (1.14 mL, 8.19 mmol, M = 101.19 g/mol, d = 0.726 g/mL) were dissolved in anhydrous dichloromethane (50 mL). Then, pivaloyl chloride (0.18 mL, 1.50 mmol, M = 120.58 g/mol, d = 0.98 g/mL) was added directly. The flask was then stirred at room temperature overnight. The solution was subsequently washed with 6 M aq. HCl and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (0.34 g, 82.0% yield).

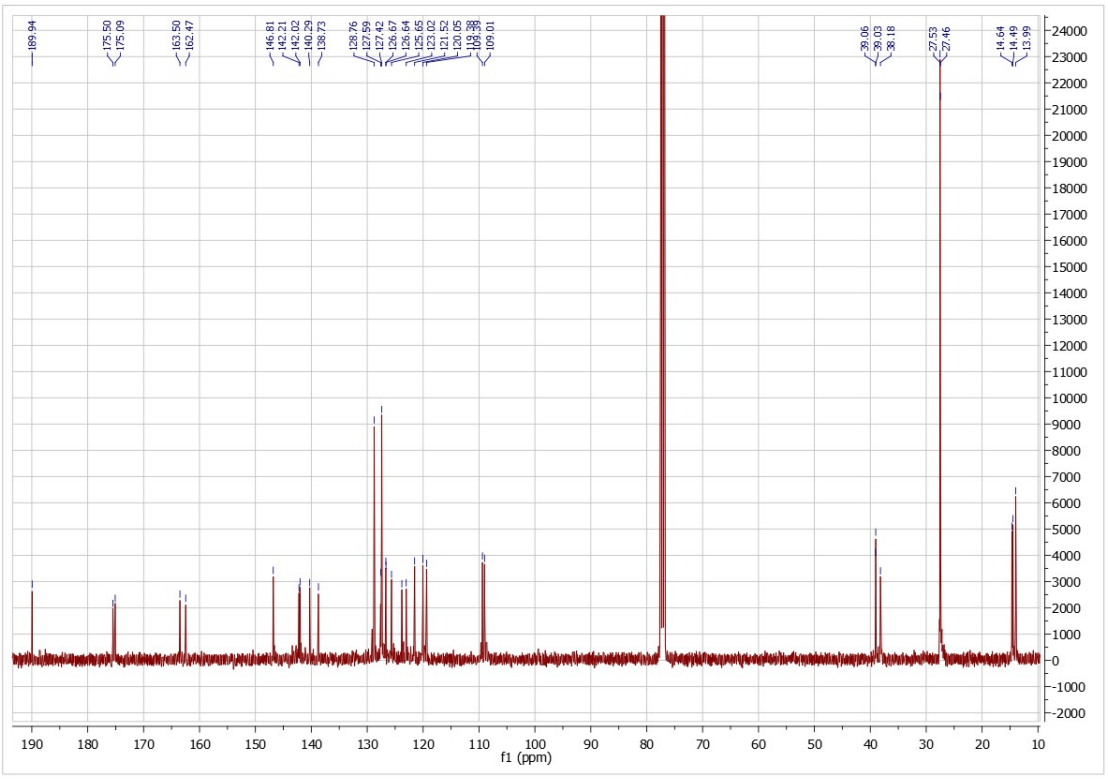
^{1}H NMR (400 MHz, $CDCl_3$) δ 8.58 (d, *J* = 1.5 Hz, 1H), 8.47 (s, 1H), 8.11 (d, *J* = 8.5 Hz, 2H), 8.05 (d, *J* = 15.6 Hz, 1H), 7.99 – 7.96 (m, 1H), 7.93 (d, *J* = 8.4 Hz, 2H), 7.79 – 7.77 (m, 1H), 7.61 (d, *J* = 15.6 Hz, 1H), 7.42 (dd, *J* = 8.5, 5.5 Hz, 2H), 4.38 (q, *J* = 7.3 Hz, 2H), 2.53 (s, 3H), 2.44 (s, 3H), 1.48 (t, *J* = 7.1 Hz, 3H), 1.38 (s, 9H), 1.37 (s, 9H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 189.94 (s), 175.50 (s), 175.09 (s), 163.50 (s), 162.47 (s), 146.81 (s), 142.21 (s), 140.29 (s), 140.29 (s), 138.73 (s), 128.76 (s), 127.42 (s), 126.67 (s), 126.64 (s), 125.65 (s), 123.80 (s), 123.02 (s), 121.52 (s), 120.05 (s), 119.38 (s), 109.39 (s), 109.01 (s), 39.06 (s), 39.03 (s), 38.18 (s), 27.53 (s), 27.46 (s), 14.64 (s), 14.49 (s), 13.99 (s).

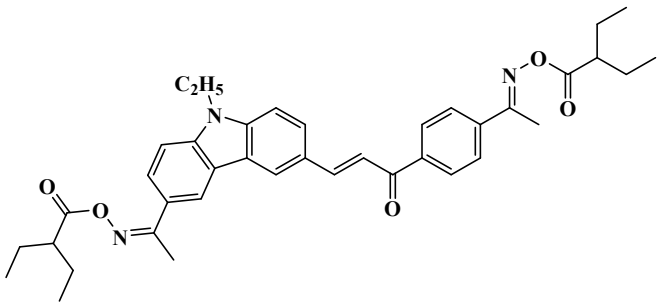
^{1}H NMR spectrum of (*E*)-3-(9-ethyl-6-((*Z*)-1-((pivaloyloxy)imino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-((pivaloyloxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE5**



^{13}C NMR spectrum of (*E*)-3-(9-ethyl-6-((*Z*)-1-((pivaloyloxy)imino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-((pivaloyloxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE5**



Synthesis of 2-ethyl-1-((((*Z*)-1-(9-ethyl-6-((*E*)-3-(4-((*E*)-1-(((2-ethylbutanoyl)oxy)imino) ethyl)phenyl)-3-oxoprop-1-en-1-yl)-9*H*-carbazol-3-yl)ethylidene)amino)oxy)butan-1-one **CCBOE6**



Chemical Formula: $C_{39}H_{45}N_3O_5$
Molecular Weight: 635,8050

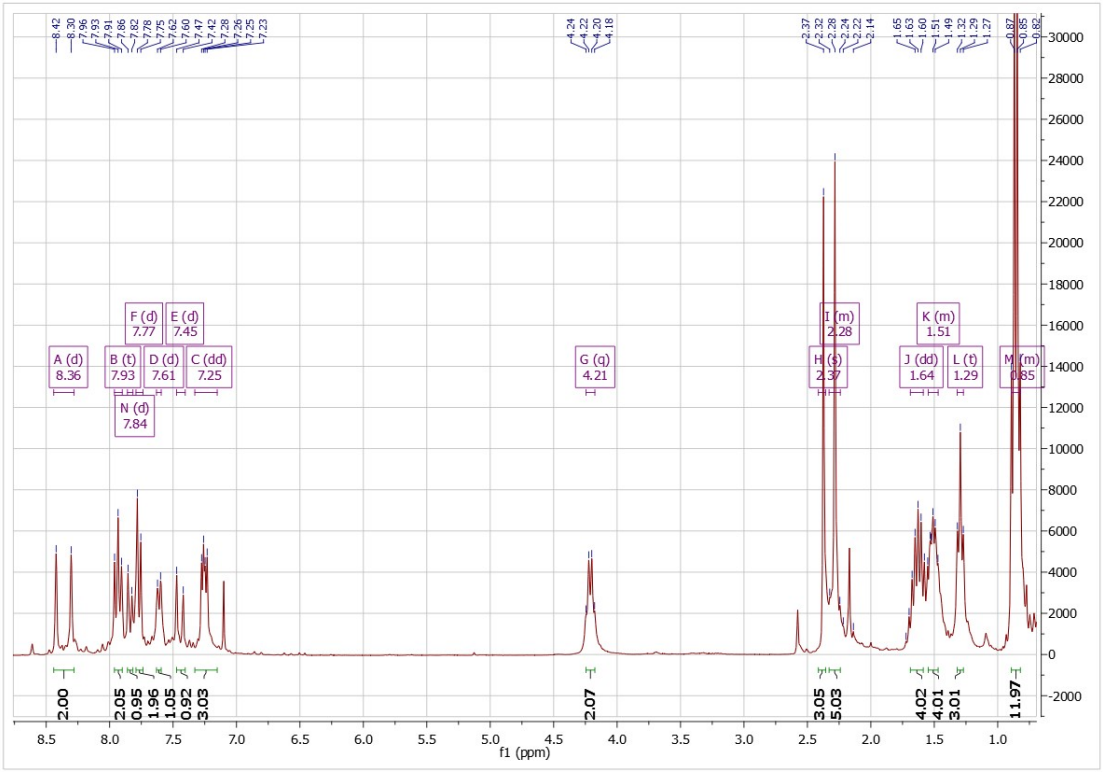
(*E*)-3-(9-Ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino) ethyl)phenyl)prop-2-en-1-one (0.3 g, 0.68 mmol, M = 439.52 g/mol) and triethylamine (1.14 mL, 8.19 mmol, M = 101.19 g/mol, d = 0.726 g/mL) were dissolved in anhydrous dichloromethane (50 mL). Then, 2-ethylbutanoyl chloride (0.21 mL, 1.50 mmol, M = 134.60 g/mol, d = 0.98 g/mL) was added directly. The flask was then stirred at room temperature overnight. The solution was subsequently washed with 6 M aq. HCl and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (0.39 g, 89.9% yield).

^{1}H NMR (300 MHz, $CDCl_3$) δ 8.36 (d, *J* = 35.5 Hz, 2H), 7.93 (t, *J* = 8.2 Hz, 2H), 7.84 (d, *J* = 9.2 Hz, 1H), 7.77 (d, *J* = 8.2 Hz, 2H), 7.61 (d, *J* = 7.3 Hz, 1H), 7.45 (d, *J* = 15.5 Hz, 1H), 7.25 (dd, *J* = 8.4, 4.7 Hz, 3H), 4.21 (q, *J* = 6.5 Hz, 2H), 2.37 (s, 3H), 2.33 – 2.24 (m, 5H), 1.64 (dd, *J* = 14.2, 7.1 Hz, 4H), 1.55 – 1.47 (m, 4H), 1.29 (t, *J* = 7.0 Hz, 3H), 0.89 – 0.82 (m, 12H).

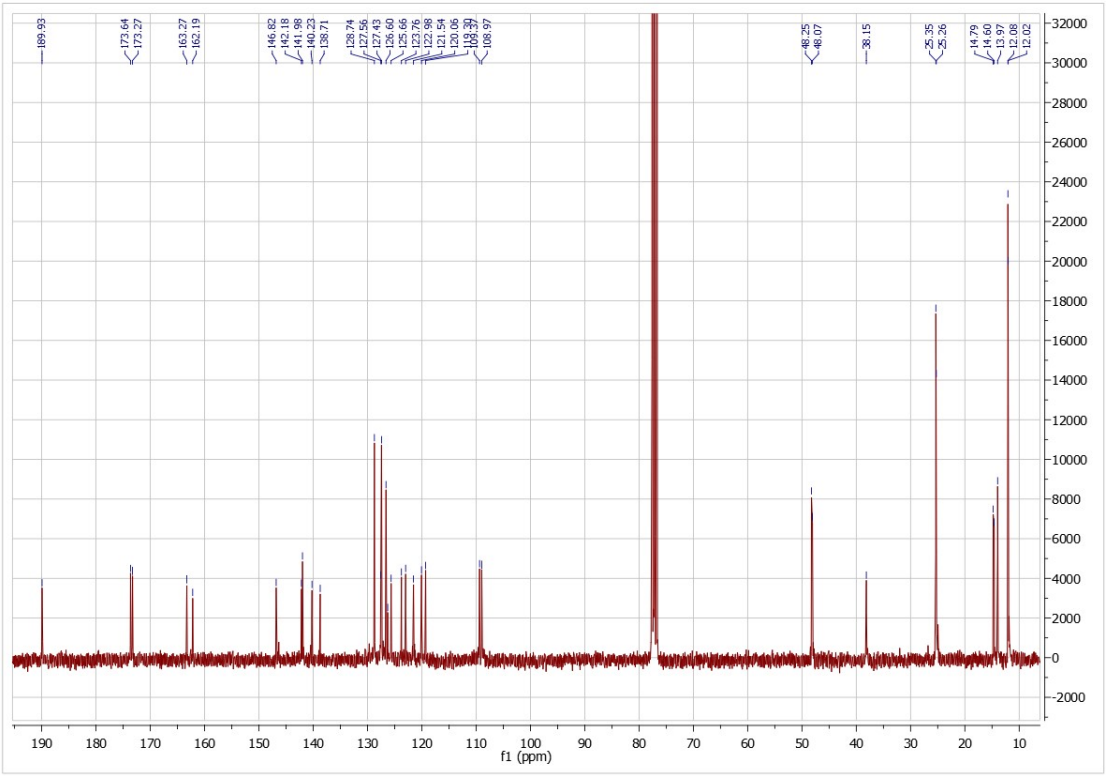
^{13}C NMR (75 MHz, $CDCl_3$) δ 189.93 (s), 173.64 (s), 173.27 (s), 163.27 (s), 162.19 (s), 146.82 (s),142.18 (s), 141.98 (s), 140.23 (s), 138.71 (s), 128.74 (s), 127.56 (s), 127.43 (s), 126.60 (s), 126.28 (s), 125.66 (s), 123.76 (s), 122.98 (s), 121.54 (s), 120.06 (s), 119.30 (s), 109.37 (s), 108.97 (s), 38.15 (s), 48.25 (s), 48.07 (s), 38.15 (s), 25.35 (s), 25.26 (s), 14.79 (s), 14.60 (s), 13.97 (s), 12.08 (s), 12.02 (s), .

HRMS (ESI MS) m/z: theor: 635.8050 found: 636.3359 ($[M+H]^+$ detected)

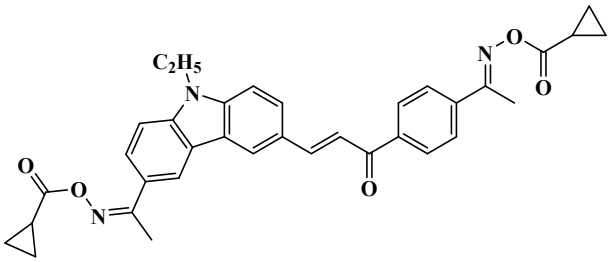
^{1}H NMR spectrum of 2-ethyl-1-((((*Z*)-1-(9-ethyl-6-((*E*)-3-(4-((*E*)-1-(((2-ethylbutanoyl)oxy)imino)ethyl)phenyl)-3-oxoprop-1-en-1-yl)-9*H*-carbazol-3-yl)ethylidene)amino)oxy)butan-1-one **CCBOE6**



^{13}C NMR spectrum of 2-ethyl-1-((((*Z*)-1-(9-ethyl-6-((*E*)-3-(4-((*E*)-1-(((2-ethylbutanoyl)oxy)imino)ethyl)phenyl)-3-oxoprop-1-en-1-yl)-9*H*-carbazol-3-yl)ethylidene)amino)oxy)butan-1-one **CCBOE6**



Synthesis of (*E*)-3-(6-((*Z*)-1-(((cyclopropanecarbonyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((cyclopropanecarbonyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one
CCBOE7



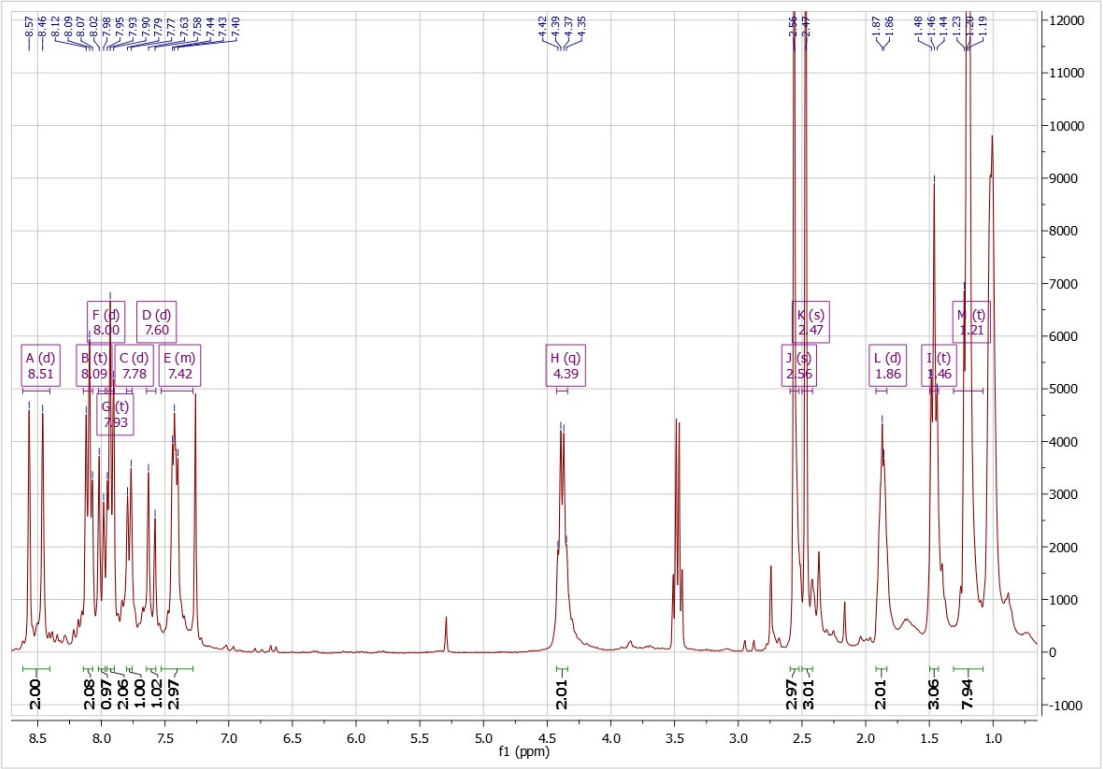
Chemical Formula: $C_{35}H_{33}N_3O_5$
Molecular Weight: 575,6650

(*E*)-3-(9-Ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino) ethyl)phenyl)prop-2-en-1-one (0.3 g, 0.68 mmol, M = 439.52 g/mol) and triethylamine (1.14 mL, 8.19 mmol, M = 101.19 g/mol, d = 0.726 g/mL) were dissolved in anhydrous dichloromethane (50 mL). Then, cyclopropanecarbonyl chloride (0.14 mL, 1.50 mmol, M = 104.53 g/mol, d = 1.15 g/mL) was added directly. The flask was then stirred at room temperature overnight. The solution was subsequently washed with 6 M aq. HCl and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (0.31 g, 78.9% yield).

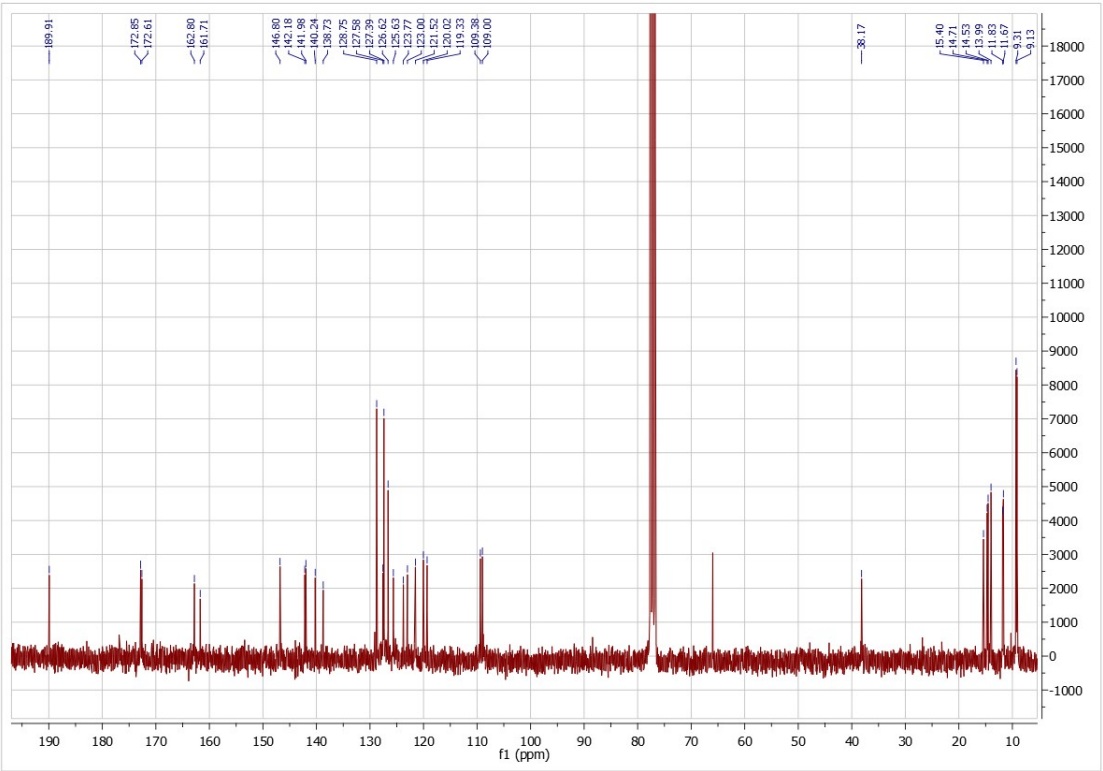
^{1}H NMR (300 MHz, $CDCl_3$) δ 8.51 (d, *J* = 32.0 Hz, 2H), 8.09 (t, *J* = 7.4 Hz, 2H), 8.00 (d, *J* = 10.5 Hz, 1H), 7.93 (t, *J* = 7.5 Hz, 2H), 7.78 (d, *J* = 8.4 Hz, 1H), 7.60 (d, *J* = 15.6 Hz, 1H), 7.53 – 7.28 (m, 3H), 4.39 (q, *J* = 6.9 Hz, 2H), 2.56 (s, 3H), 2.47 (s, 3H), 1.86 (d, *J* = 3.6 Hz, 2H), 1.46 (t, *J* = 6.8 Hz, 3H), 1.21 (t, *J* = 5.8 Hz, 8H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.91 (s), 172.85 (s), 172.61 (s), 162.80 (s), 161.71 (s), 146.80 (s), 142.18 (s), 141.98 (s), 140.24 (s), 138.73 (s), 128.75 (s), 127.58 (s), 127.39 (s), 126.62 (s), 125.63 (s), 123.77 (s), 123.00 (s), 121.52 (s), 120.02 (s), 119.33 (s), 109.38 (s), 109.00 (s), 38.17 (s), 15.40 (s), 14.71 (s), 14.53 (s), 13.99 (s), 11.83 (s), 11.67 (s), 9.31 (s), 9.13 (s).

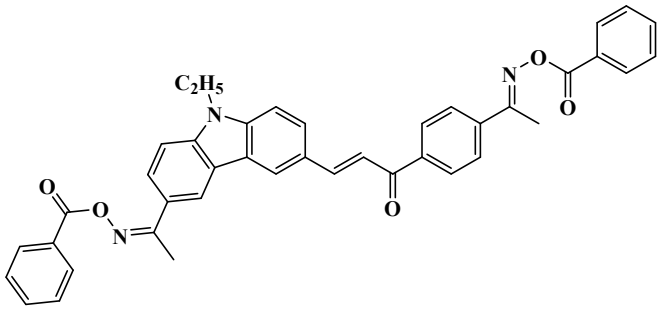
^{1}H NMR spectrum of (*E*)-3-(6-((*Z*)-1-(((cyclopropanecarbonyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((cyclopropanecarbonyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE7**



^{13}C NMR spectrum of (*E*)-3-(6-((*Z*)-1-(((cyclopropanecarbonyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((cyclopropanecarbonyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE7**



Synthesis of (*E*)-3-(6-((*Z*)-1-((benzoyloxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-((benzoyloxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE8**



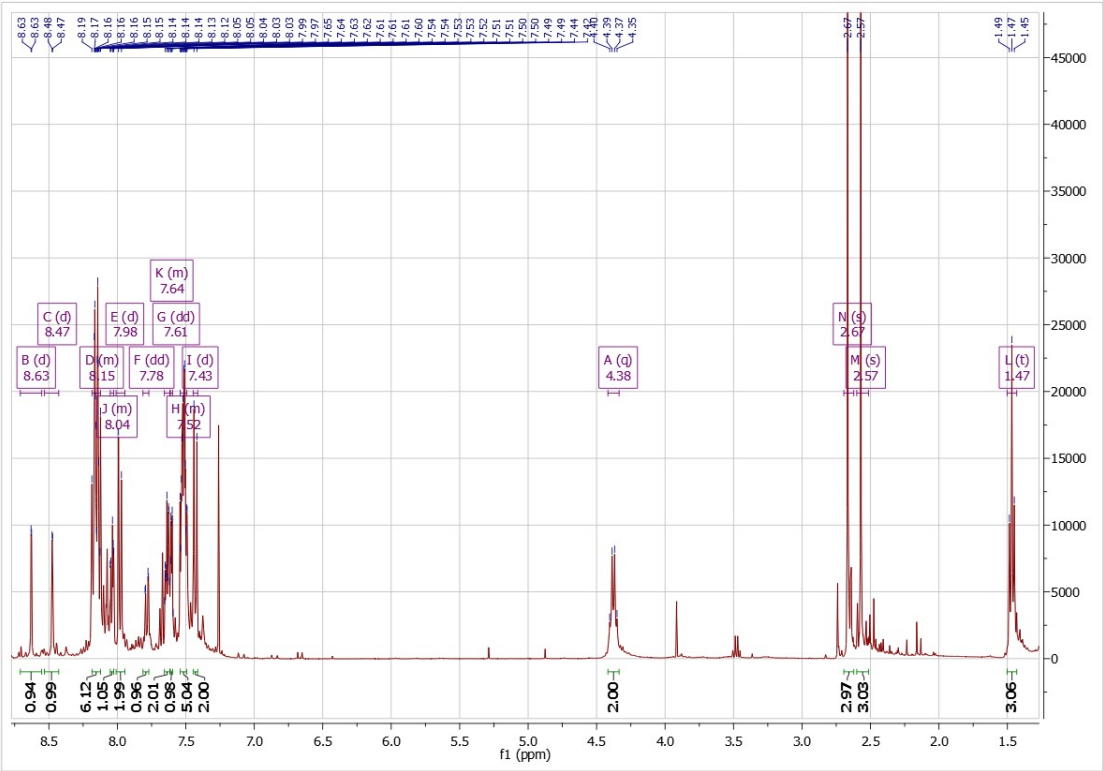
Chemical Formula: $C_{41}H_{33}N_3O_5$
Molecular Weight: 647,7310

(*E*)-3-(9-Ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino) ethyl)phenyl)prop-2-en-1-one (0.3 g, 0.68 mmol, M = 439.52 g/mol) and triethylamine (1.14 mL, 8.19 mmol, M = 101.19 g/mol, d = 0.726 g/mL) were dissolved in anhydrous dichloromethane (50 mL). Then, benzoyl chloride (0.17 mL, 1.50 mmol, M = 140.57 g/mol, d = 1.21 g/mL) was added directly. The flask was then stirred at room temperature overnight. The solution was subsequently washed with 6 M aq. HCl and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (0.41 g, 92.7% yield).

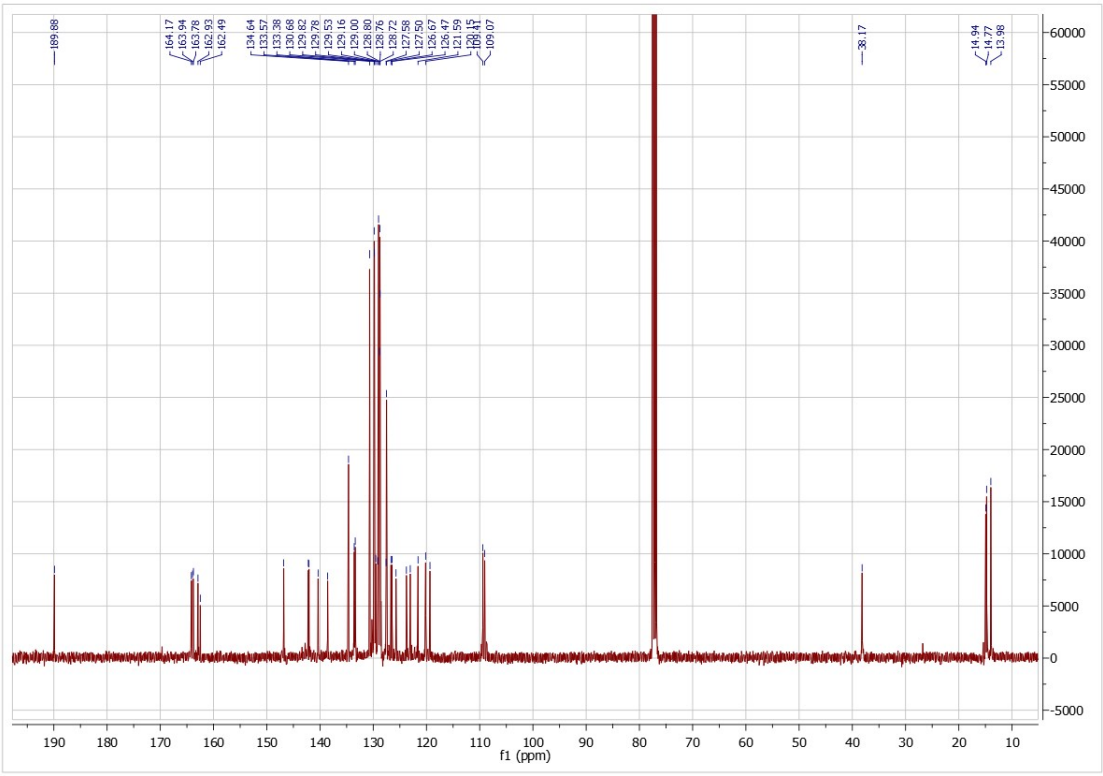
^{1}H NMR (400 MHz, $CDCl_3$) δ 8.63 (d, *J* = 1.6 Hz, 1H), 8.47 (d, *J* = 1.3 Hz, 1H), 8.19 – 8.12 (m, 6H), 8.05 – 8.03 (m, 1H), 7.98 (d, *J* = 8.5 Hz, 2H), 7.78 (dd, *J* = 8.5, 1.5 Hz, 1H), 7.66 – 7.62 (m, 2H), 7.61 (dd, *J* = 3.0, 1.8 Hz, 1H), 7.54 – 7.49 (m, 5H), 7.43 (d, *J* = 8.6 Hz, 2H), 4.38 (q, *J* = 7.1 Hz, 2H), 2.67 (s, 3H), 2.57 (s, 3H), 1.47 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 189.88 (s), 164.17 (s), 163.94 (s), 163.78 (s), 162.93 (s), 162.49 (s), 146.82 (s), 142.20 (s), 142.07 (s), 140.36 (s), 138.57 (s), 134.64 (s), 133.57 (s), 133.38 (s), 130.68 (s), 129.82 (s), 129.78 (s), 129.00 (s), 128.80 (s), 128.76 (s), 128.76 (s), 128.72 (s), 127.58 (s), 127.50 (s), 126.67 (s), 126.47 (s), 125.72 (s), 123.77 (s), 123.04 (s), 121.59 (s), 120.15 (s), 119.34 (s), 109.41 (s), 109.07 (s), 38.17 (s), 14.94 (s), 14.77 (s), 13.98 (s).

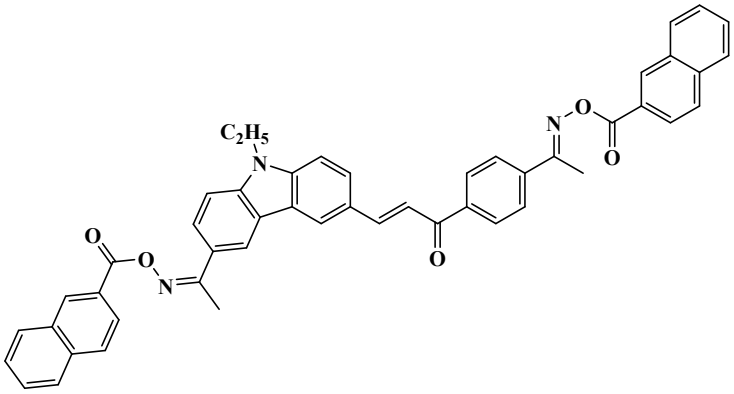
^{1}H NMR spectrum of (*E*)-3-(6-((*Z*)-1-((benzoyloxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-((benzoyloxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE8**



^{13}C NMR spectrum of (*E*)-3-(6-((*Z*)-1-((benzoyloxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-((benzoyloxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE8**



Synthesis of (*E*)-3-(6-((*Z*)-1-(((2-naphthoyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((2-naphthoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE9**



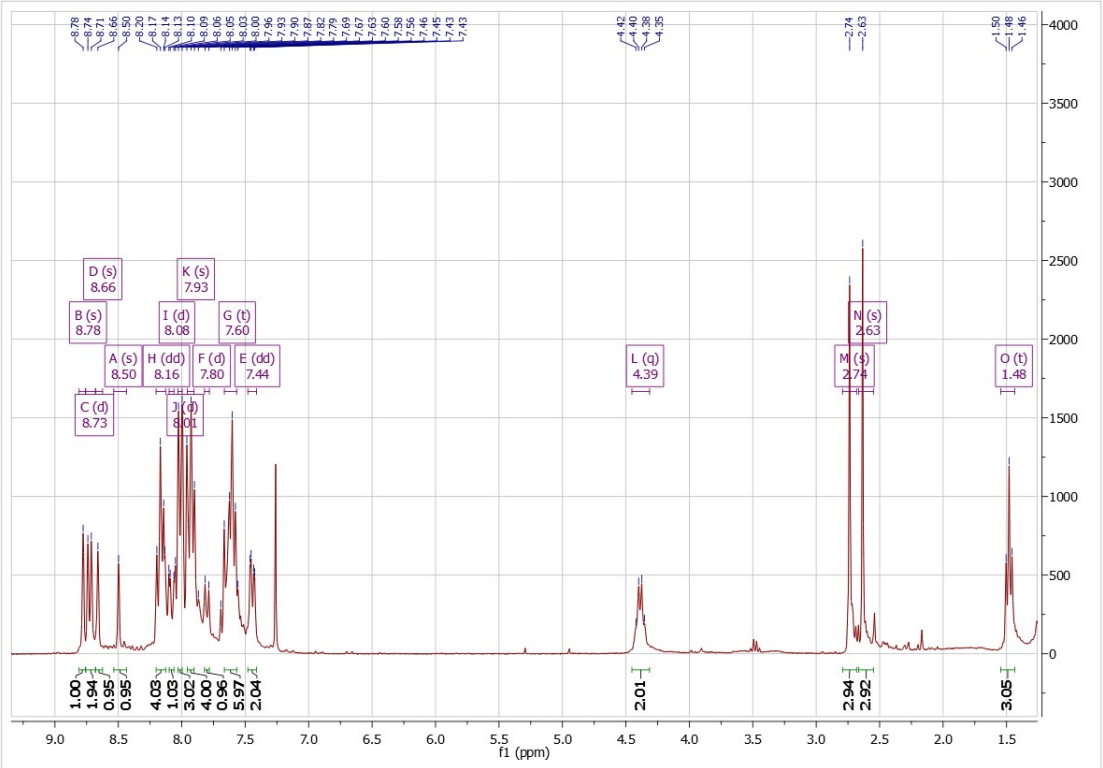
Chemical Formula: $C_{49}H_{37}N_3O_5$
Molecular Weight: 747,8510

(*E*)-3-(9-Ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino) ethyl)phenyl)prop-2-en-1-one (0.3 g, 0.68 mmol, M = 439.52 g/mol) and triethylamine (1.14 mL, 8.19 mmol, M = 101.19 g/mol, d = 0.726 g/mL) were dissolved in anhydrous dichloromethane (50 mL). Then, 2-naphthoyl chloride (0.29 g, 1.50 mmol, M = 190.63 g/mol) was added directly. The flask was then stirred at room temperature overnight. The solution was subsequently washed with 6 M aq. HCl and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (0.38 g, 74.4% yield).

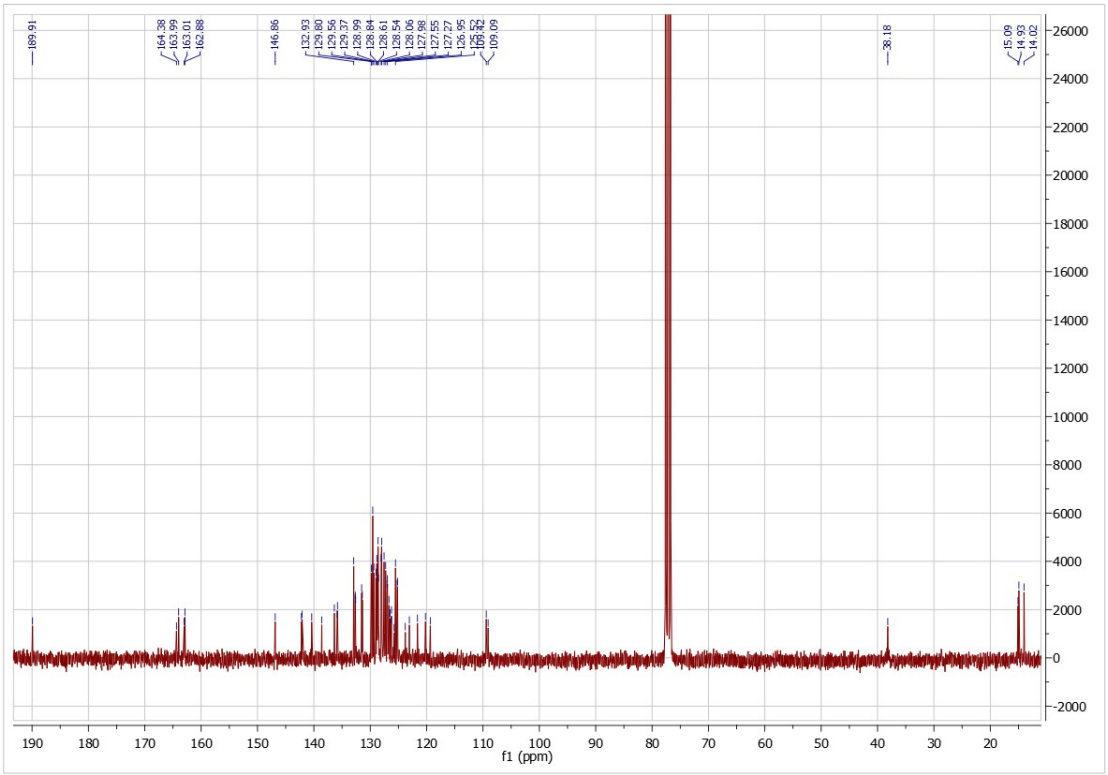
^{1}H NMR (300 MHz, $CDCl_3$) δ 8.78 (s, 1H), 8.73 (d, *J* = 8.3 Hz, 2H), 8.66 (s, 1H), 8.50 (s, 1H), 8.16 (dd, *J* = 13.5, 5.8 Hz, 4H), 8.08 (d, *J* = 8.8 Hz, 1H), 8.01 (d, *J* = 8.7 Hz, 3H), 7.93 (s, 4H), 7.80 (d, *J* = 8.8 Hz, 1H), 7.60 (t, *J* = 7.2 Hz, 6H), 7.44 (dd, *J* = 8.5, 2.2 Hz, 2H), 4.39 (q, *J* = 7.1 Hz, 2H), 2.74 (s, 3H), 2.63 (s, 3H), 1.48 (t, *J* = 7.1 Hz, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.91 (s), 164.38 (s), 163.99 (s), 163.01 (s), 162.88 (s), 146.86 (s), 142.21 (s), 142.09 (s), 140.38 (s), 138.60 (s), 136.37 (s), 135.87 (s), 135.81 (s), 132.93 (s), 132.69 (s), 131.53 (s), 131.40 (s), 129.80 (s), 129.56 (s), 129.37 (s), 128.99 (s), 128.84 (s), 128.61 (s), 128.54 (s), 128.06 (s), 127.98 (s), 127.55 (s), 127.27 (s), 127.02 (s), 126.95 (s), 126.68 (s), 126.49 (s), 126.32 (s), 126.23 (s), 125.52 (s), 125.23 (s), 125.16 (s), 123.78 (s), 123.06 (s), 121.62 (s), 120.21 (s), 119.34 (s), 109.42 (s), 109.09 (s), 38.18 (s), 15.09 (s), 14.93 (s), 14.02 (s).

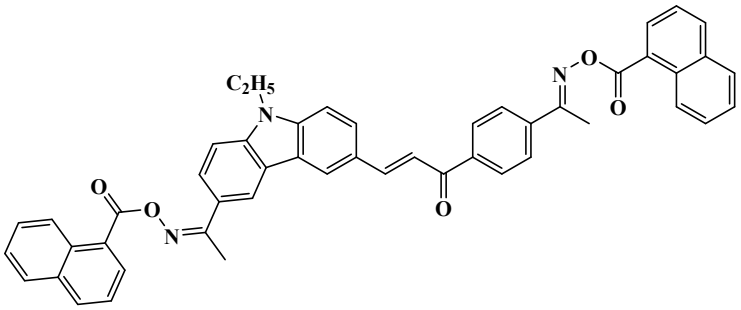
^{1}H NMR spectrum of (*E*)-3-(6-((*Z*)-1-(((2-naphthoyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((2-naphthoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE9**



^{13}C NMR spectrum of (*E*)-3-(6-((*Z*)-1-(((2-naphthoyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((2-naphthoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE9**



Synthesis of (*E*)-3-(6-((*Z*)-1-(((1-naphthoyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((1-naphthoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE10**



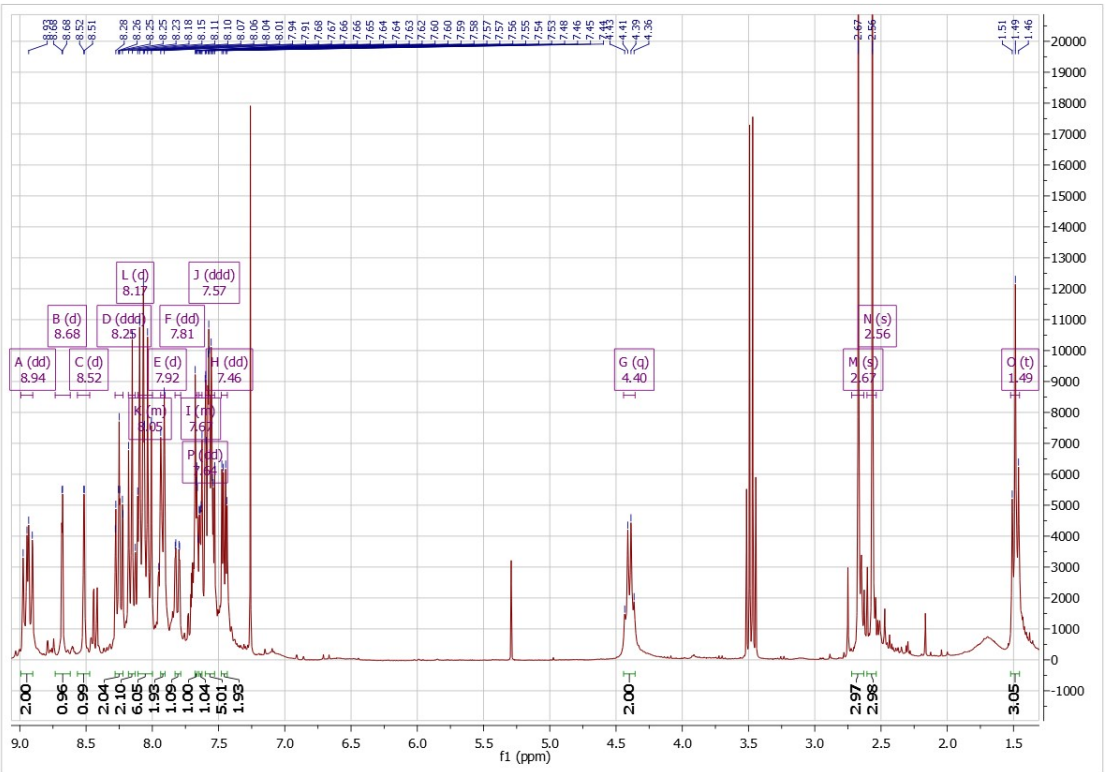
Chemical Formula: $C_{49}H_{37}N_3O_5$
Molecular Weight: 747,8510

(*E*)-3-(9-Ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino) ethyl)phenyl)prop-2-en-1-one (0.3 g, 0.68 mmol, M = 439.52 g/mol) and triethylamine (1.14 mL, 8.19 mmol, M = 101.19 g/mol, d = 0.726 g/mL) were dissolved in anhydrous dichloromethane (50 mL). Then, 1-naphthoyl chloride (0.23 mL, 1.50 mmol, M = 190.63 g/mol, d = 1.27 g/mL) was added directly. The flask was then stirred at room temperature overnight. The solution was subsequently washed with 6 M aq. HCl and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (0.43 g, 84.8% yield).

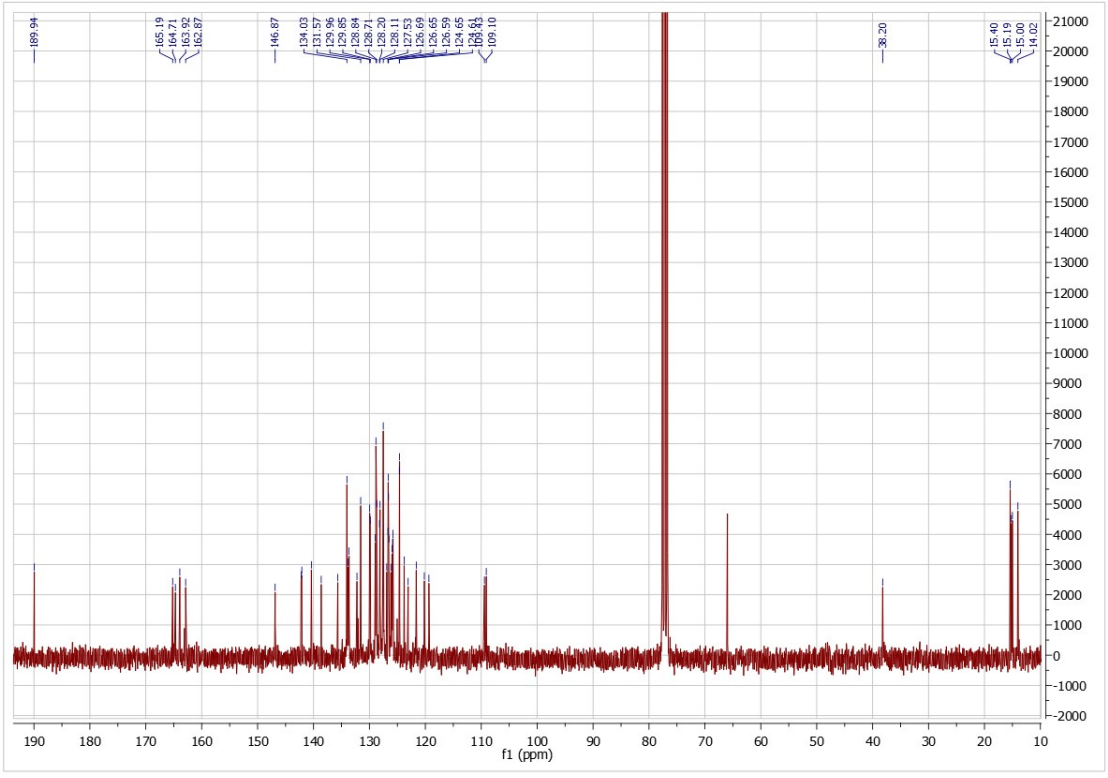
^{1}H NMR (300 MHz, $CDCl_3$) δ 8.94 (dd, *J* = 12.3, 8.5 Hz, 2H), 8.68 (d, *J* = 1.5 Hz, 1H), 8.52 (d, *J* = 1.0 Hz, 1H), 8.25 (ddd, *J* = 8.7, 7.3, 1.2 Hz, 2H), 8.17 (d, *J* = 8.5 Hz, 2H), 8.11 – 8.00 (m, 6H), 7.92 (d, *J* = 8.0 Hz, 2H), 7.81 (dd, *J* = 8.5, 1.4 Hz, 1H), 7.68 – 7.66 (m, 1H), 7.64 (dd, *J* = 3.2, 1.6 Hz, 1H), 7.57 (ddd, *J* = 8.6, 5.0, 1.8 Hz, 5H), 7.46 (dd, *J* = 8.5, 3.3 Hz, 2H), 4.40 (q, *J* = 7.0 Hz, 2H), 2.67 (s, 3H), 2.56 (s, 3H), 1.49 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.94 (s), 165.19 (s), 164.71 (s), 163.92 (s), 162.87 (s), 146.87 (s), 142.22 (s), 142.10 (s), 140.38 (s), 138.62 (s), 135.66 (s), 134.03 (s), 133.87 (s), 133.65 (s), 132.23 (s), 131.57 (s), 129.96 (s), 129.85 (s), 128.95 (s), 128.84 (s), 128.71 (s), 128.11 (s), 127.53 (s), 126.91 (s), 126.69 (s), 126.59 (s), 126.50 (s), 126.17 (s), 125.96 (s), 125.86 (s), 125.79 (s), 124.65 (s), 124.61 (s), 123.79 (s), 123.08 (s), 121.62 (s), 120.18 (s), 119.37 (s), 109.43 (s), 109.10 (s), 38.20 (s), 15.40 (s), 15.19 (s), 15.00 (s), 14.02 (s).

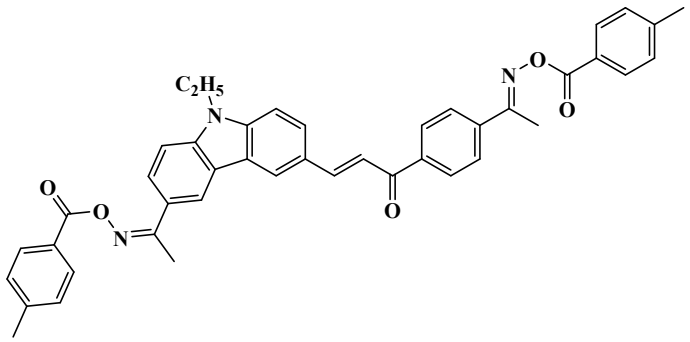
^{1}H NMR spectrum of (*E*)-3-(6-((*Z*)-1-(((1-naphthoyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((1-naphthoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE10**



^{13}C NMR spectrum of (*E*)-3-(6-((*Z*)-1-(((1-naphthoyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((1-naphthoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE10**



Synthesis of (*E*)-3-(9-ethyl-6-((*Z*)-1-(((4-methylbenzoyl)oxy)imino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((4-methylbenzoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE11**



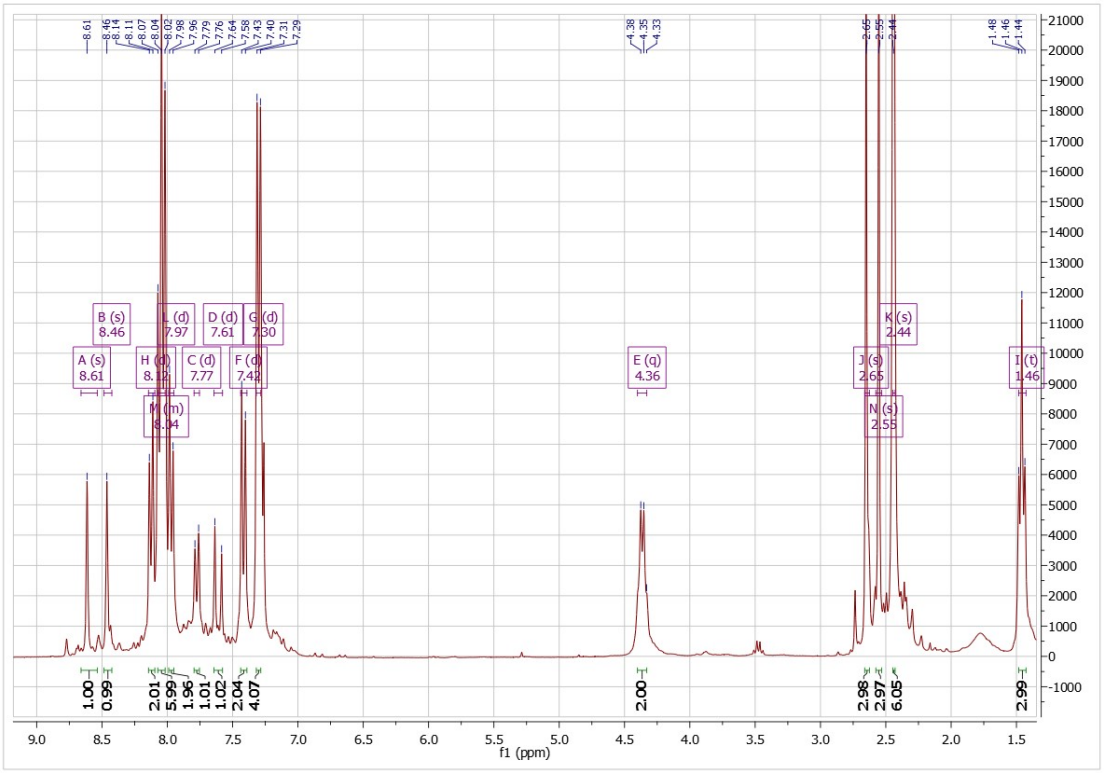
Chemical Formula: $C_{43}H_{37}N_3O_5$
Molecular Weight: 675,7850

(*E*)-3-(9-Ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino) ethyl)phenyl)prop-2-en-1-one (0.3 g, 0.68 mmol, M = 439.52 g/mol) and triethylamine (1.14 mL, 8.19 mmol, M = 101.19 g/mol, d = 0.726 g/mL) were dissolved in anhydrous dichloromethane (50 mL). Then, 4-methylbenzoyl chloride (0.20 mL, 1.50 mmol, M = 154.59 g/mol, d = 1.17 g/mL) was added directly. The flask was then stirred at room temperature overnight. The solution was subsequently washed with 6 M aq. HCl and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (0.41 g, 88.9% yield).

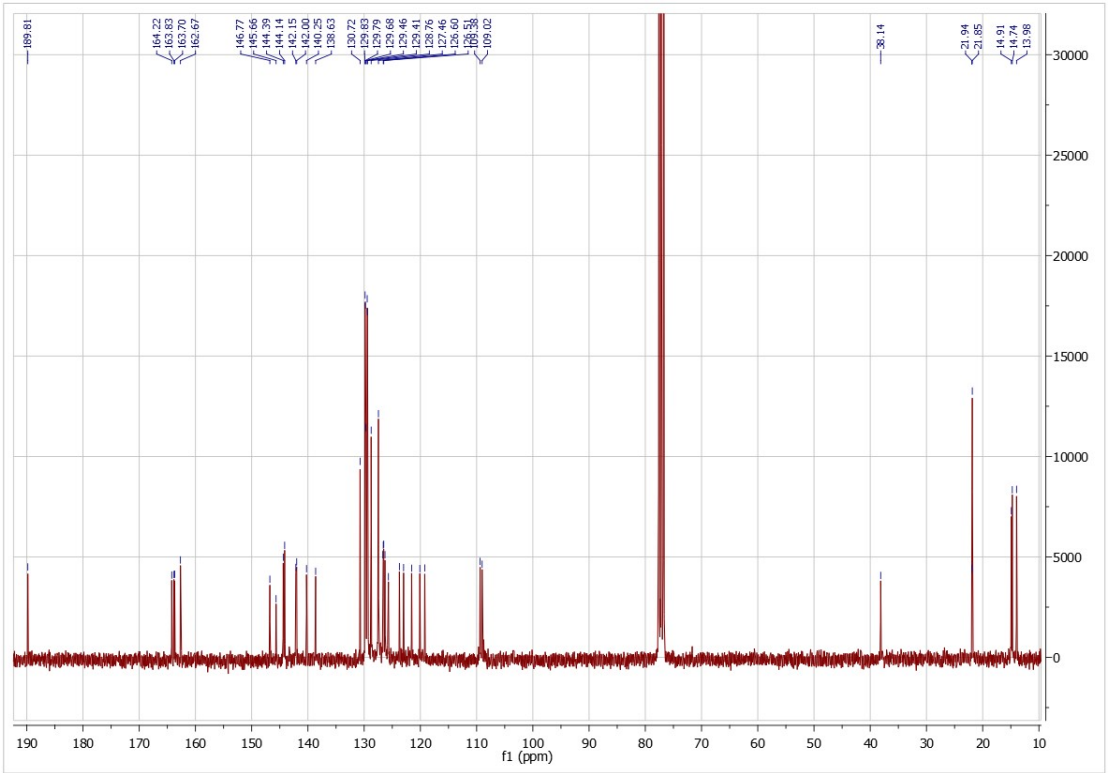
^{1}H NMR (300 MHz, $CDCl_3$) δ 8.61 (s, 1H), 8.46 (s, 1H), 8.12 (d, *J* = 8.1 Hz, 2H), 8.07 – 8.02 (m, 6H), 7.97 (d, *J* = 8.1 Hz, 2H), 7.77 (d, *J* = 8.5 Hz, 1H), 7.61 (d, *J* = 15.5 Hz, 1H), 7.42 (d, *J* = 8.5 Hz, 2H), 7.30 (d, *J* = 7.8 Hz, 4H), 4.36 (q, *J* = 7.0 Hz, 2H), 2.65 (s, 3H), 2.55 (s, 3H), 2.44 (s, 6H), 1.46 (t, *J* = 7.0 Hz, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.81 (s), 164.22 (s), 163.83 (s), 163.70 (s), 162.67 (s), 146.77 (s), 145.66 (s), 144.39 (s), 144.14 (s), 142.15 (s), 142.00 (s), 140.25 (s), 138.63 (s), 130.72 (s), 129.83 (s), 129.79 (s), 129.68 (s), 129.46 (s), 129.41 (s), 128.76 (s), 127.46 (s), 126.60 (s), 126.51 (s), 126.30 (s), 125.68 (s), 123.73 (s), 122.99 (s), 121.56 (s), 120.10 (s), 119.23 (s), 109.38 (s), 109.02 (s), 38.14 (s), 21.94 (s), 21.85 (s), 14.91 (s), 14.71 (s), 13.98 (s).

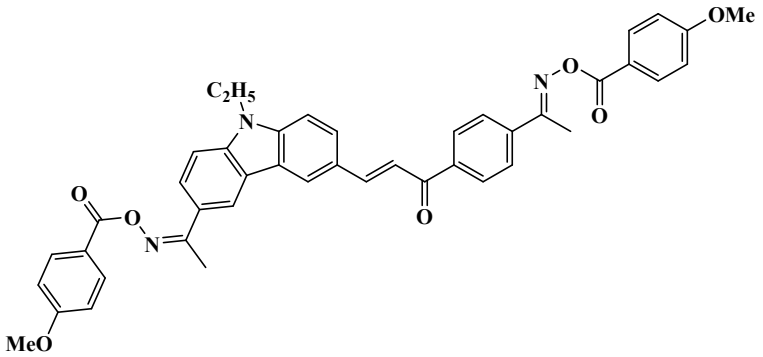
^{1}H NMR spectrum of (*E*)-3-(9-ethyl-6-((*Z*)-1-(((4-methylbenzoyl)oxy)imino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((4-methylbenzoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one
CCBOE11



^{13}C NMR spectrum of (*E*)-3-(9-ethyl-6-((*Z*)-1-(((4-methylbenzoyl)oxy)imino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((4-methylbenzoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one
CCBOE11



Synthesis of (*E*)-3-(9-ethyl-6-((*Z*)-1-(((4-methoxybenzoyl)oxy)imino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((4-methoxybenzoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE12**



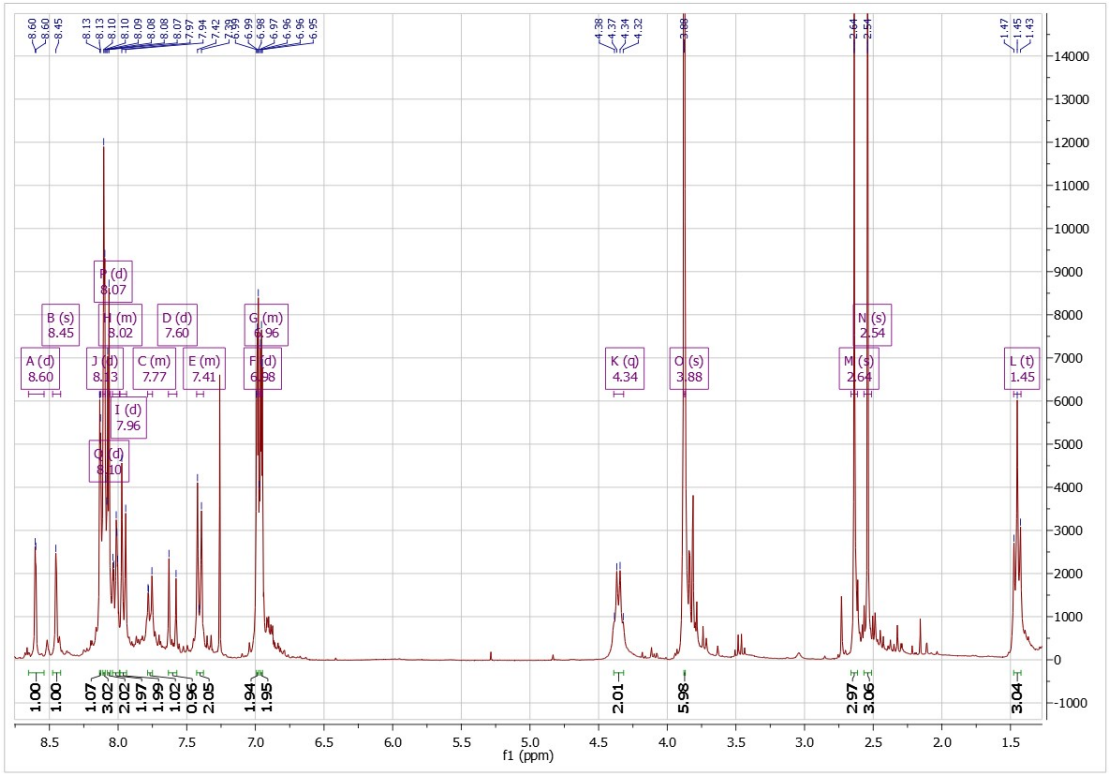
Chemical Formula: $C_{43}H_{37}N_3O_7$
Molecular Weight: 707,7830

(*E*)-3-(9-Ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino) ethyl)phenyl)prop-2-en-1-one (0.3 g, 0.68 mmol, M = 439.52 g/mol) and triethylamine (1.14 mL, 8.19 mmol, M = 101.19 g/mol, d = 0.726 g/mL) were dissolved in anhydrous dichloromethane (50 mL). Then, 4-methoxybenzoyl chloride (0.20 mL, 1.50 mmol, M = 170.59 g/mol, d = 1.26 g/mL) was added directly. The flask was then stirred at room temperature overnight. The solution was subsequently washed with 6 M aq. HCl and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (0.39 g, 80.7% yield).

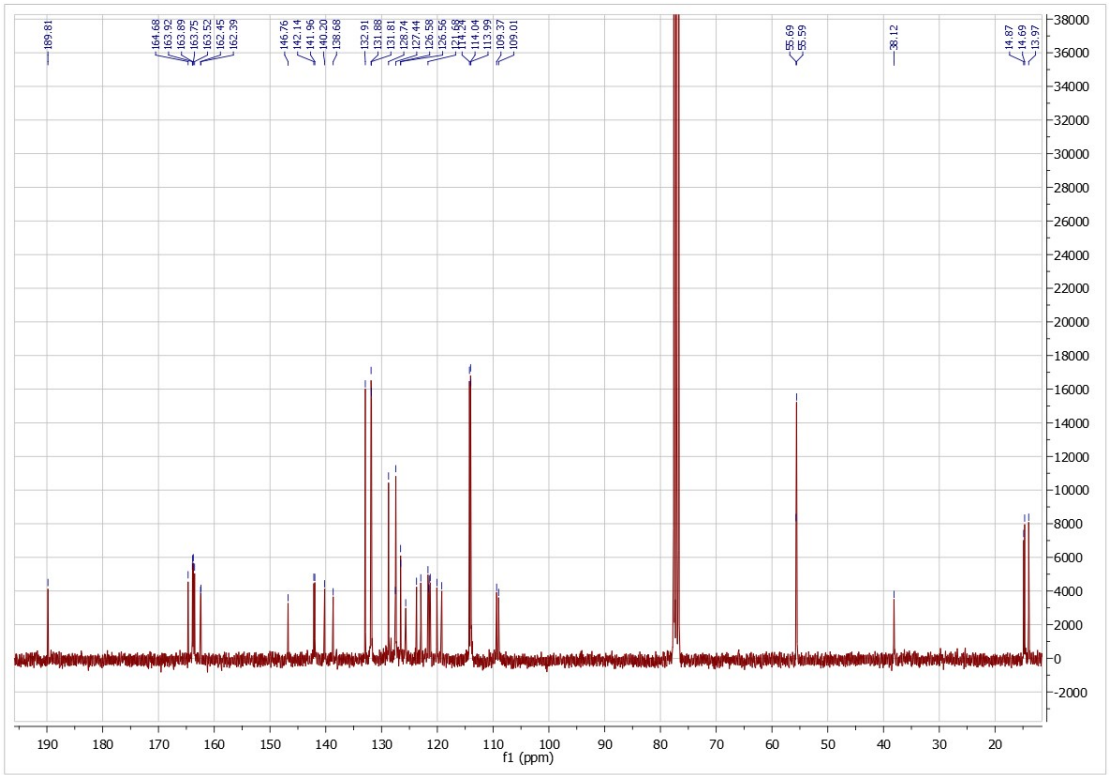
^{1}H NMR (300 MHz, $CDCl_3$) δ 8.60 (d, *J* = 1.4 Hz, 1H), 8.45 (s, 1H), 8.13 (d, *J* = 1.5 Hz, 1H), 8.10 (d, *J* = 2.5 Hz, 3H), 8.07 (d, *J* = 2.9 Hz, 2H), 8.04 – 7.99 (m, 2H), 7.96 (d, *J* = 8.5 Hz, 2H), 7.79 – 7.75 (m, 1H), 7.60 (d, *J* = 15.5 Hz, 1H), 7.43 – 7.38 (m, 2H), 6.98 (d, *J* = 2.1 Hz, 2H), 6.96 – 6.95 (m, 2H), 4.34 (q, *J* = 7.0 Hz, 2H), 3.88 (s, 6H), 2.64 (s, 3H), 2.54 (s, 3H), 1.45 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.81 (s), 164.68 (s), 163.92 (s), 163.89 (s), 163.75 (s), 163.52 (s), 162.45(s), 162.39 (s), 146.76 (s), 142.14 (s), 141.96 (s), 140.20 (s), 138.68 (s), 132.91 (s), 131.88 (s), 131.81 (s), 128.74 (s), 127.52 (s), 127.44 (s), 126.58 (s), 126.56 (s), 125.67 (s), 123.72 (s), 122.97 (s), 121.68 (s), 121.56 (s), 121.37 (s), 121.27 (s), 120.08 (s), 119.21 (s), 114.24 (s), 114.04 (s), 113.99 (s), 109.37 (s), 109.01 (s), 55.69 (s), 55.59 (s), 38.12 (s), 14.87 (s), 14.69 (s), 13.97 (s).

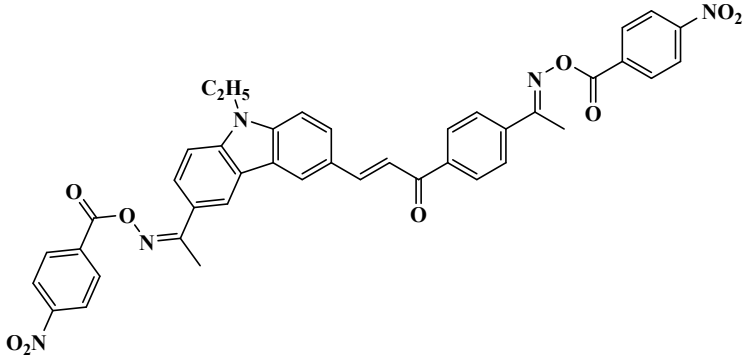
^{1}H NMR spectrum of (*E*)-3-(9-ethyl-6-((*Z*)-1-(((4-methoxybenzoyl)oxy)imino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((4-methoxybenzoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one
CCBOE12



^{13}C NMR spectrum of (*E*)-3-(9-ethyl-6-((*Z*)-1-(((4-methoxybenzoyl)oxy)imino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((4-methoxybenzoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one
CCBOE12



Synthesis of (*E*)-3-(9-ethyl-6-((*Z*)-1-(((4-nitrobenzoyl)oxy)imino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((4-nitrobenzoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE13**

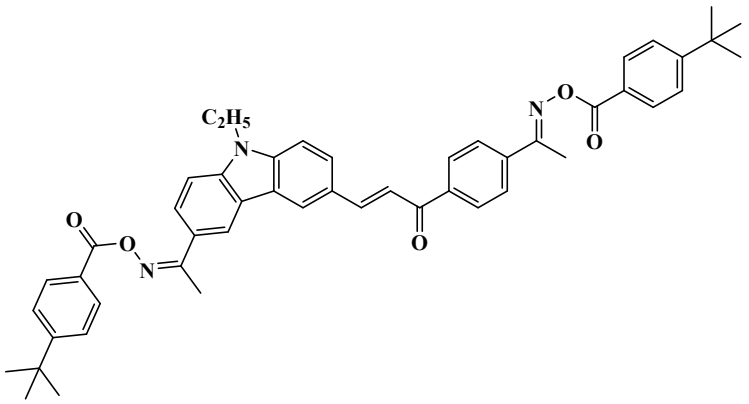


Chemical Formula: $C_{41}H_{31}N_5O_9$
Molecular Weight: 737,7250

(*E*)-3-(9-Ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino) ethyl)phenyl)prop-2-en-1-one (0.3 g, 0.68 mmol, M = 439.52 g/mol) and triethylamine (1.14 mL, 8.19 mmol, M = 101.19 g/mol, d = 0.726 g/mL) were dissolved in anhydrous dichloromethane (50 mL). Then, 4-nitrobenzoyl chloride (0.28 g, 1.50 mmol, M = 185.56 g/mol) was added directly. The flask was then stirred at room temperature overnight. The solution was subsequently washed with 6 M aq. HCl and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (0.42 g, 83.41% yield).

HRMS (ESI MS) m/z: theor: 737.7250 found: 738.2122 ($[M+H]^+$ detected)

Synthesis of (*E*)-3-(6-((*Z*)-1-(((4-(*tert*-butyl)benzoyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((4-(*tert*-butyl)benzoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE14**



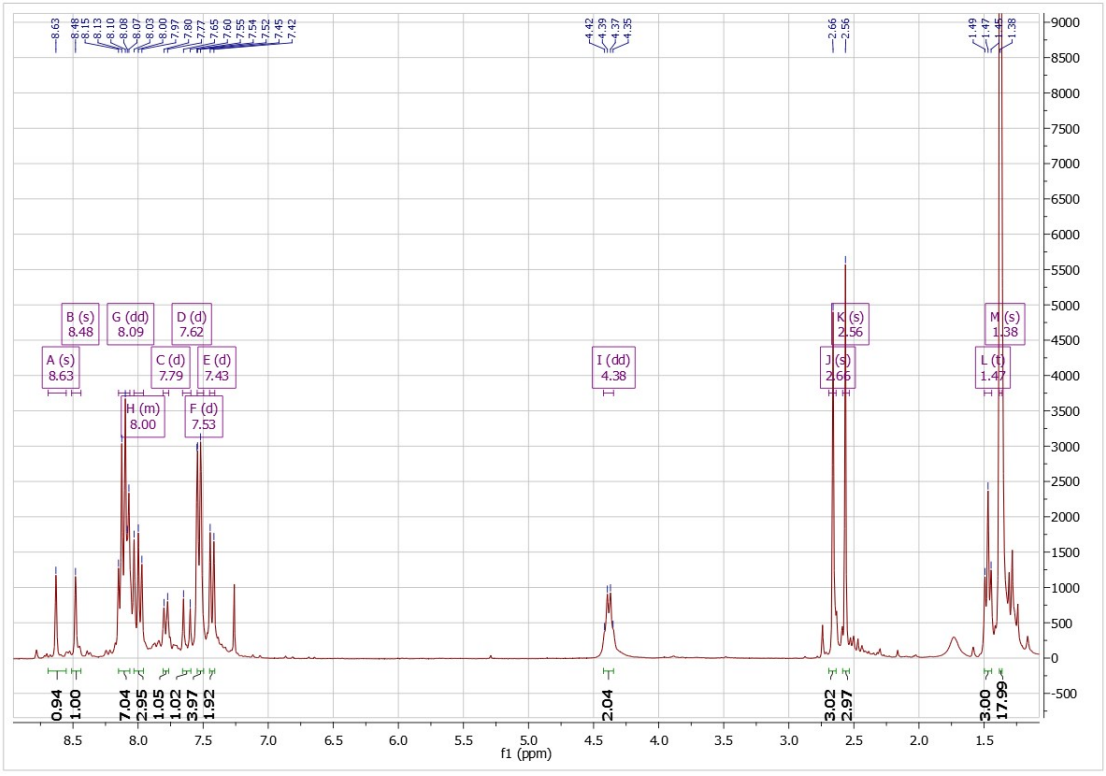
Chemical Formula: $C_{49}H_{49}N_3O_5$
Molecular Weight: 759,9470

(*E*)-3-(9-Ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino) ethyl)phenyl)prop-2-en-1-one (0.3 g, 0.68 mmol, M = 439.52 g/mol) and triethylamine (1.14 mL, 8.19 mmol, M = 101.19 g/mol, d = 0.726 g/mL) were dissolved in anhydrous dichloromethane (50 mL). Then, 4-(*tert*-butyl)benzoyl chloride (0.29 mL, 1.50 mmol, M = 196.67 g/mol, d = 1.01 g/mL) was added directly. The flask was then stirred at room temperature overnight. The solution was subsequently washed with 6 M aq. HCl and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (0.45 g, 86.7% yield).

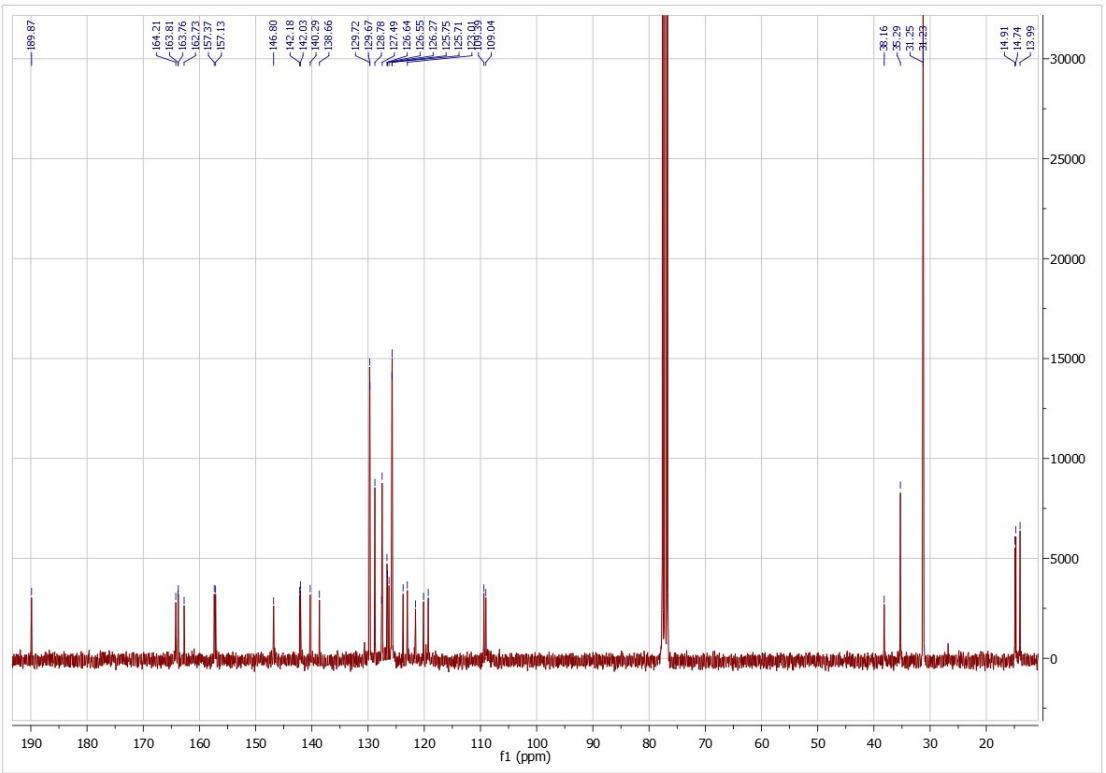
^{1}H NMR (300 MHz, $CDCl_3$) δ 8.63 (s, 1H), 8.48 (s, 1H), 8.09 (dd, *J* = 10.6, 6.0 Hz, 7H), 8.03 – 7.96 (m, 3H), 7.79 (d, *J* = 8.5 Hz, 1H), 7.62 (d, *J* = 15.6 Hz, 1H), 7.53 (d, *J* = 7.1 Hz, 4H), 7.43 (d, *J* = 8.6 Hz, 2H), 4.38 (q, *J* = 7.1 Hz, 2H), 2.66 (s, 3H), 2.56 (s, 3H), 1.47 (t, *J* = 7.0 Hz, 3H), 1.38 (s, 18H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.87 (s), 164.21 (s), 163.81 (s), 163.76 (s), 162.73 (s), 157.37 (s), 157.13 (s), 146.80 (s), 142.18 (s), 142.03 (s), 140.29 (s), 138.66 (s), 129.72 (s), 129.67 (s), 128.78 (s), 127.49 (s), 126.64 (s), 126.55 (s), 126.27 (s), 126.27 (s), 125.75 (s), 125.71 (s), 123.76 (s), 123.01 (s), 121.56 (s), 120.13 (s), 119.29 (s), 109.39 (s), 109.04 (s), 38.16 (s), 35.29 (s), 31.25 (s), 31.23 (s), 14.91 (s), 14.74 (s), 13.99 (s).

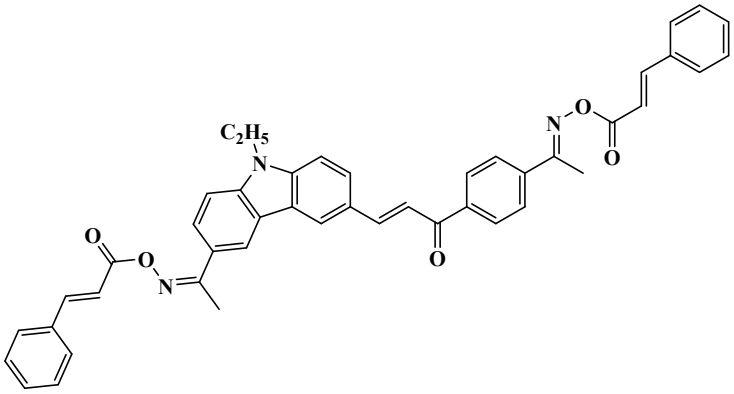
^{1}H NMR spectrum of (*E*)-3-(6-((*Z*)-1-(((4-(*tert*-butyl)benzoyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((4-(*tert*-butyl)benzoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE14**



^{13}C NMR spectrum of (*E*)-3-(6-((*Z*)-1-(((4-(*tert*-butyl)benzoyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(((4-(*tert*-butyl)benzoyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE14**



Synthesis of (*E*)-3-(6-((*Z*)-1-((cinnamoyloxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-((cinnamoyloxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE15**



Chemical Formula: $C_{45}H_{37}N_3O_5$
Molecular Weight: 699,8070

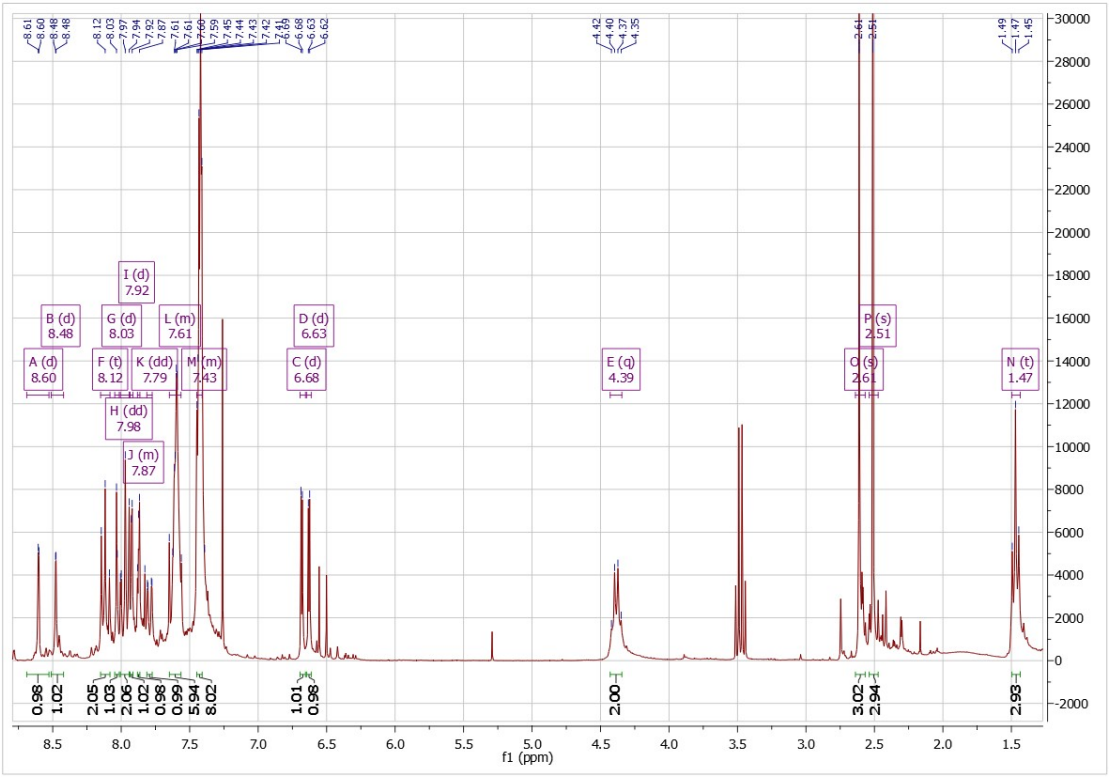
(*E*)-3-(9-Ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino) ethyl)phenyl)prop-2-en-1-one (0.3 g, 0.68 mmol, M = 439.52 g/mol) and triethylamine (1.14 mL, 8.19 mmol, M = 101.19 g/mol, d = 0.726 g/mL) were dissolved in anhydrous dichloromethane (50 mL). Then, cinnamoyl chloride (0.25 g, 1.50 mmol, M = 166.60 g/mol) was added directly. The flask was then stirred at room temperature overnight. The solution was subsequently washed with 6 M aq. HCl and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (0.40 g, 83.7% yield).

^{1}H NMR (300 MHz, $CDCl_3$) δ 8.60 (d, *J* = 1.5 Hz, 1H), 8.48 (d, *J* = 1.1 Hz, 1H), 8.12 (t, *J* = 9.0 Hz, 2H), 8.03 (d, *J* = 1.6 Hz, 1H), 7.98 (dd, *J* = 13.9, 5.1 Hz, 2H), 7.92 (d, *J* = 1.9 Hz, 1H), 7.88 – 7.86 (m, 1H), 7.79 (dd, *J* = 8.6, 1.4 Hz, 1H), 7.65 – 7.56 (m, 6H), 7.45 – 7.41 (m, 8H), 6.68 (d, *J* = 2.9 Hz, 1H), 6.63 (d, *J* = 2.9 Hz, 1H), 4.39 (q, *J* = 7.0 Hz, 2H), 2.61 (s, 3H), 2.51 (s, 3H), 1.47 (t, *J* = 7.2 Hz, 3H).

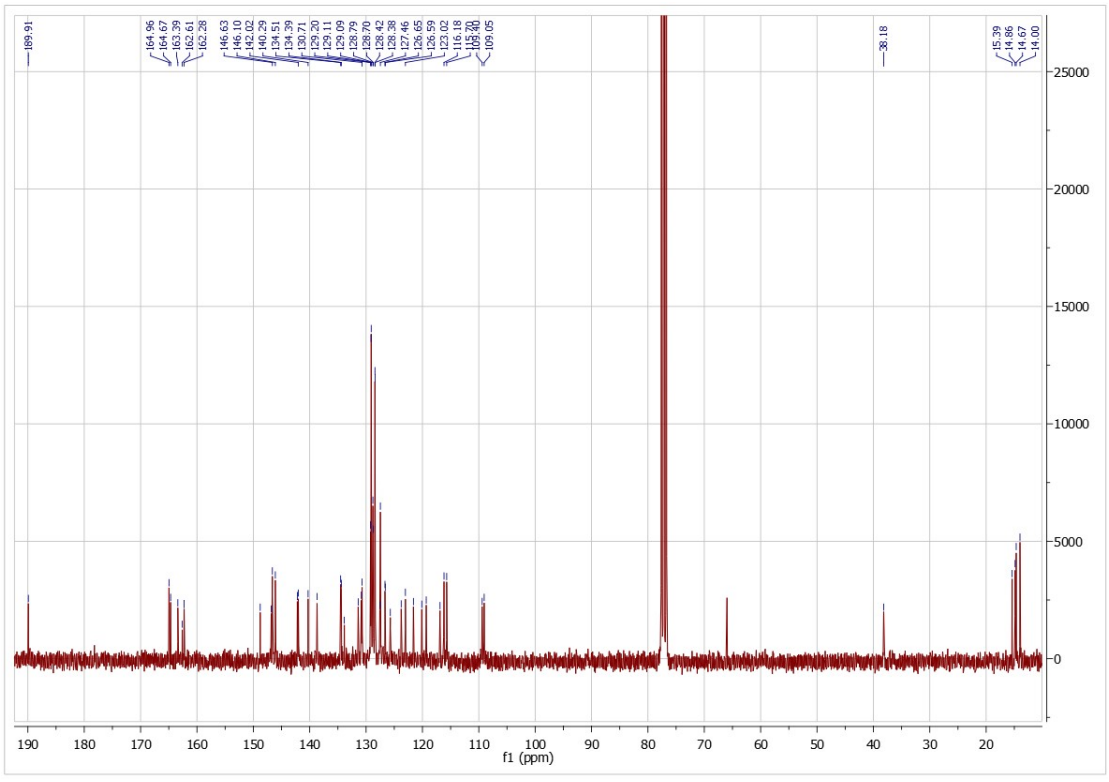
^{13}C NMR (75 MHz, $CDCl_3$) δ 189.91 (s), 164.96 (s), 164.67 (s), 163.39 (s), 162.28 (s), 148.78 (s), 146.83 (s), 146.63 (s), 146.10 (s), 142.19 (s), 142.02 (s), 140.29 (s), 138.69 (s), 134.51 (s), 134.39 (s), 133.86 (s), 131.40 (s), 130.71 (s), 129.20 (s), 129.11 (s), 129.09 (s), 128.79 (s), 128.70 (s), 128.42 (s), 128.38 (s), 127.57 (s), 127.46 (s), 126.65 (s), 126.59 (s), 125.70 (s), 123.77 (s), 123.02 (s), 121.60 (s), 120.12 (s), 119.33 (s), 116.88 (s), 116.18 (s), 115.70 (s), 109.40 (s), 109.05 (s), 38.18 (s), 15.39 (s), 14.86 (s), 14.67 (s), 14.00 (s).

HRMS (ESI MS) m/z: theor: 699.8070 found: 700.2733 ($[M+H]^+$ detected)

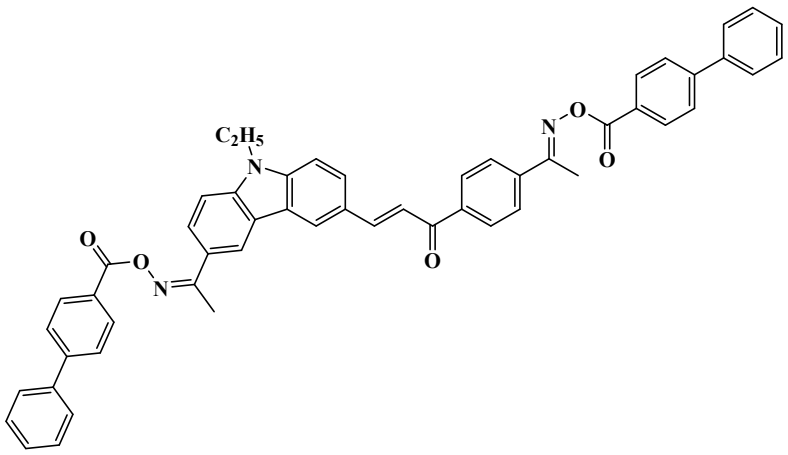
^{1}H NMR spectrum of (*E*)-3-(6-((*Z*)-1-((cinnamoyloxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-((cinnamoyloxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE15**



^{13}C NMR spectrum of (*E*)-3-(6-((*Z*)-1-((cinnamoyloxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-((cinnamoyloxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE15**



Synthesis of (*E*)-3-(6-((*Z*)-1-((([1,1'-biphenyl]-4-carbonyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-((([1,1'-biphenyl]-4-carbonyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE16**



Chemical Formula: $C_{53}H_{41}N_3O_5$
Molecular Weight: 799,9270

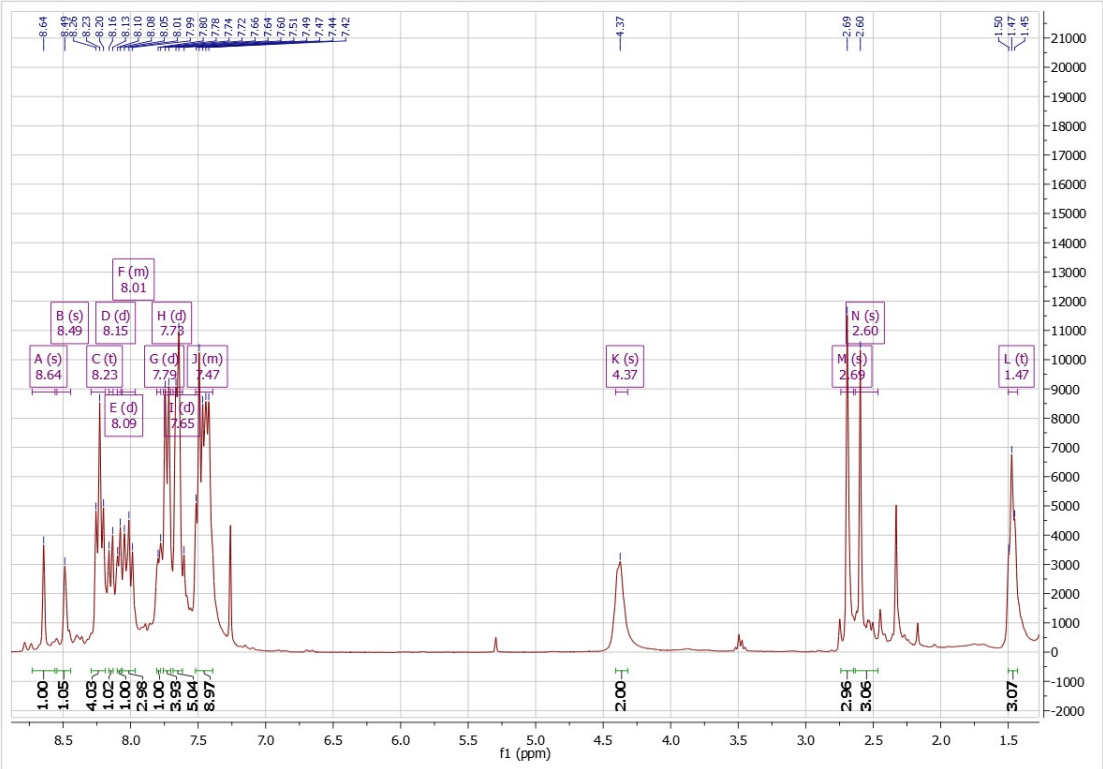
(*E*)-3-(9-Ethyl-6-((*Z*)-1-(hydroxyimino)ethyl)-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-(hydroxyimino) ethyl)phenyl)prop-2-en-1-one (0.3 g, 0.68 mmol, M = 439.52 g/mol) and triethylamine (1.14 mL, 8.19 mmol, M = 101.19 g/mol, d = 0.726 g/mL) were dissolved in anhydrous dichloromethane (50 mL). Then, 2,2-diphenylacetyl chloride (0.33 g, 1.50 mmol, M = 216.66 g/mol) was added directly. The flask was then stirred at room temperature overnight. The solution was subsequently washed with 6 M aq. HCl and dried over $MgSO_4$. After evaporation of the volatiles, the raw product was recrystallized from dichloromethane/ether to give the product as a solid (0.42 g, 76.9% yield).

^{1}H NMR (300 MHz, $CDCl_3$) δ 8.64 (s, 1H), 8.49 (s, 1H), 8.23 (t, *J* = 8.4 Hz, 4H), 8.15 (d, *J* = 8.1 Hz, 1H), 8.09 (d, *J* = 6.0 Hz, 1H), 8.06 – 7.96 (m, 3H), 7.79 (d, *J* = 5.7 Hz, 1H), 7.73 (d, *J* = 7.8 Hz, 4H), 7.65 (d, *J* = 6.5 Hz, 5H), 7.52 – 7.39 (m, 9H), 4.37 (s, 2H), 2.69 (s, 3H), 2.60 (s, 3H), 1.47 (t, *J* = 6.6 Hz, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.89 (s), 164.10 (s), 163.95 (s), 163.71 (s), 162.92 (s), 146.85 (s), 146.60 (s), 146.36 (s), 146.17 (s), 142.07 (s), 140.35 (s), 140.06 (s), 138.98 (s), 130.36 (s), 130.32 (s), 129.12 (s), 128.82 (s), 128.40 (s), 128.17 (s), 127.78 (s), 127.53 (s), 127.44 (s), 126.67 (s), 126.48 (s), 126.30 (s), 125.75 (s), 123.77 (s), 123.05 (s), 121.62 (s), 120.16 (s), 119.31 (s), 109.42 (s), 109.07 (s), 38.18 (s), 15.00 (s), 14.83 (s), 14.01 (s).

HRMS (ESI MS) m/z: theor: 799.9270 found: 800.3046 ($[M+H]^+$ detected)

^{1}H NMR spectrum of (*E*)-3-(6-((*Z*)-1-((([1,1'-biphenyl]-4-carbonyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-((([1,1'-biphenyl]-4-carbonyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE16**



^{13}C NMR spectrum of (*E*)-3-(6-((*Z*)-1-((([1,1'-biphenyl]-4-carbonyl)oxy)imino)ethyl)-9-ethyl-9*H*-carbazol-3-yl)-1-(4-((*E*)-1-((([1,1'-biphenyl]-4-carbonyl)oxy)imino)ethyl)phenyl)prop-2-en-1-one **CCBOE16**