Supplementary Material

Asymmetric flavone-based liquid crystals

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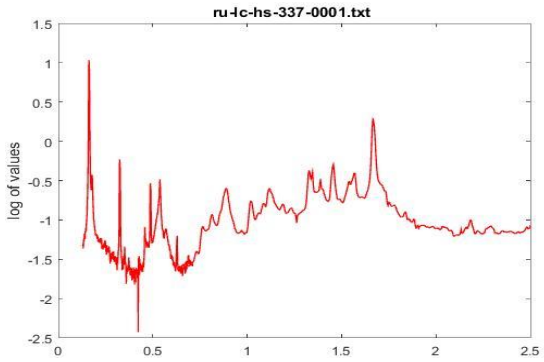
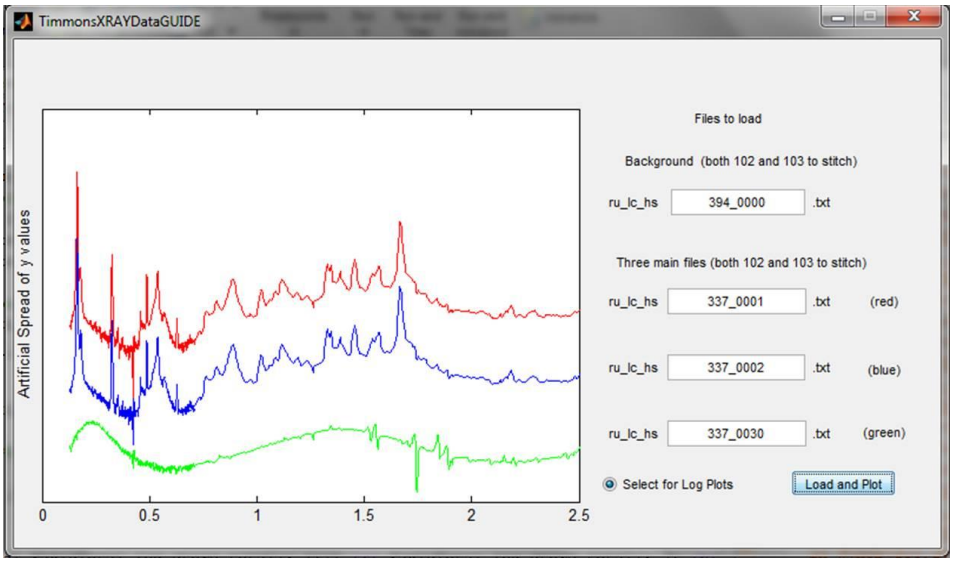
PXRD data:

Summary of subtraction of background data and plot creation: experimental data was imported, stored in two data files (based on two time intervals), along with background noise data in a third file, into a Matlab file, followed by concatenation into one data set and subtraction of the corresponding background noise. Results were plotted with [*q* (Å^{-1})] as horizontal axis and log of [I (arbitrary units)] on the vertical axis. Example: imported and concatenated data in ru_lc_hs103_337_0001.txt and ru_lc_hs102_337_0001.txt, subtracted background data contained in ru_lc_hs103_394_000.txt and plotted time versus log data (as pictured).



The picture below shows a graphical user interface (GUI) that was developed in order to compare data from three different data files. Picture shown using data from samples ru_lc_hs_337_0001.txt, ru_lc_hs_337_0002.txt, and ru_lc_hs_337_0030.txt, background in ru_lc_hs_394_0000.txt



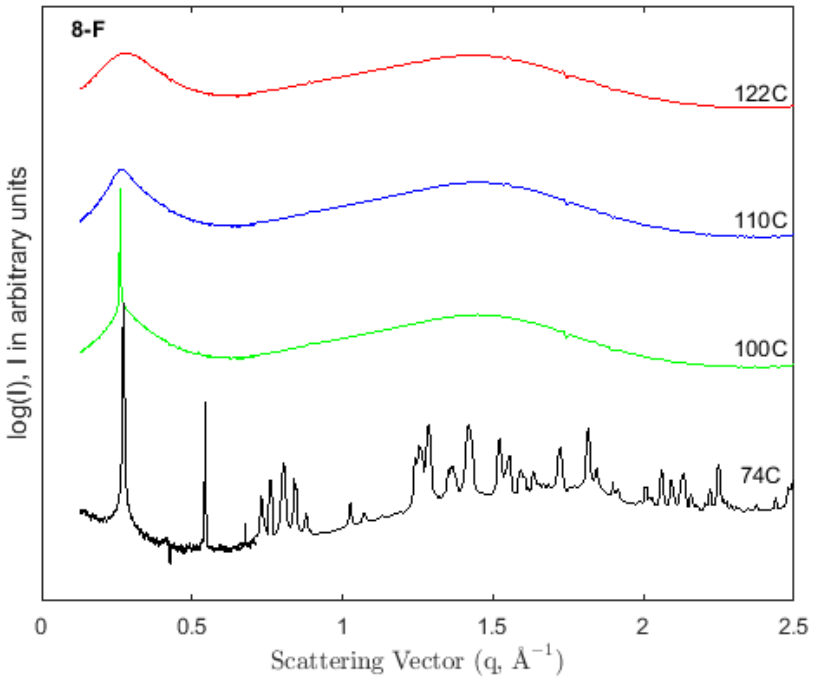


Figure S1. PXRD data of **8-F** at four temperatures. Curves have been offset vertically for clarity.

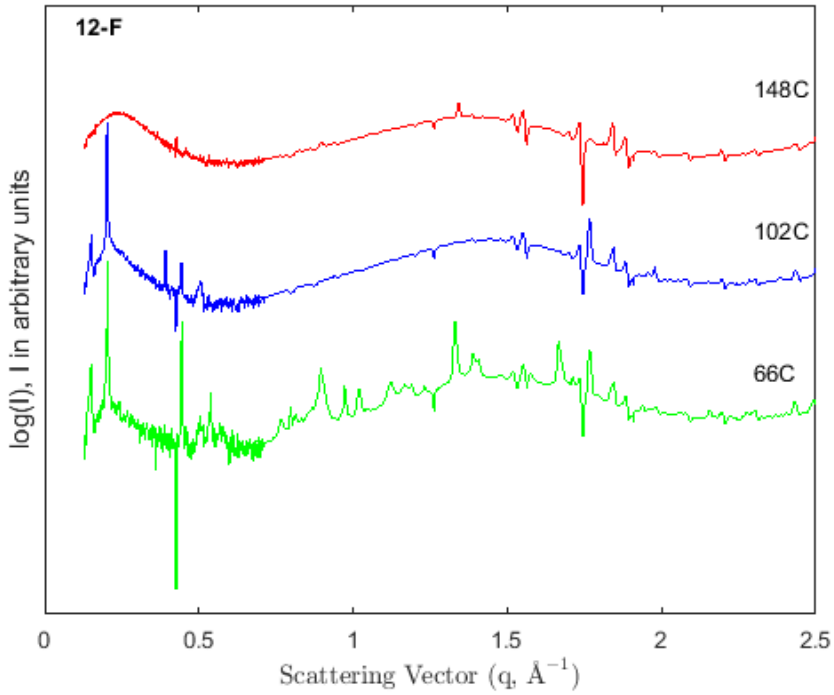


Figure S2. PXRD data of **12-F** at three temperatures. Curves have been offset vertically for clarity.

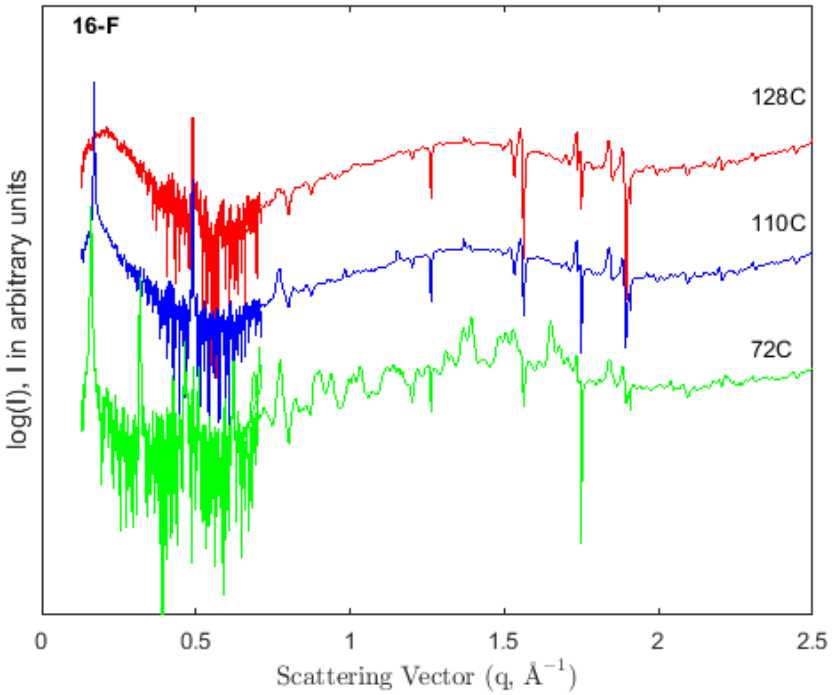


Figure S3. PXRD data of **16-F** at three temperatures. Curves have been offset vertically for clarity.

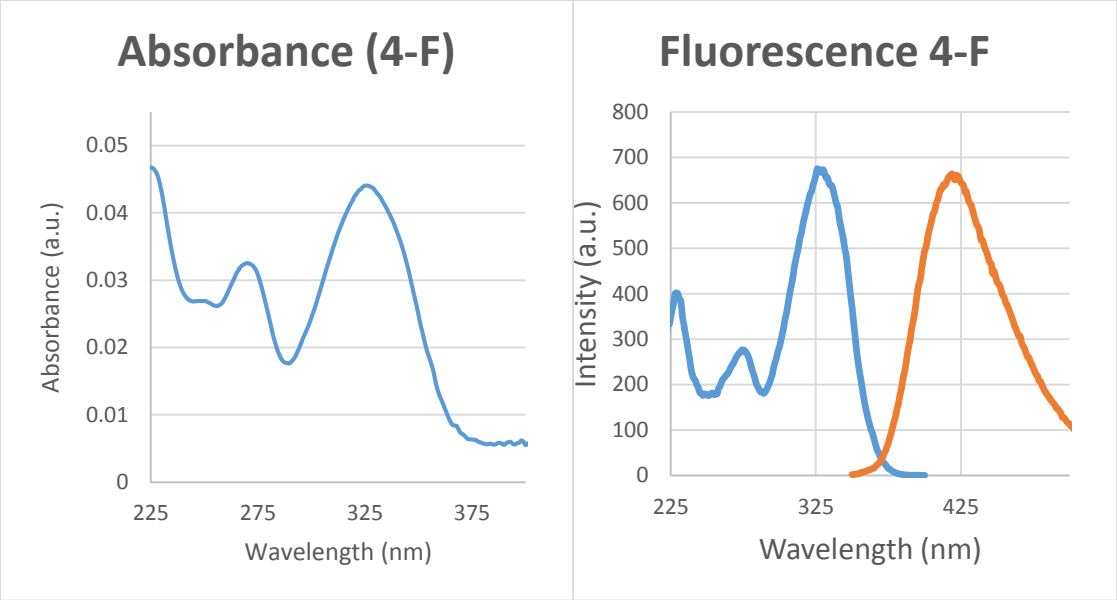


Figure S4. Absorbance spectra for **4-F** in methanol (2.68 x 10^{-6} M).

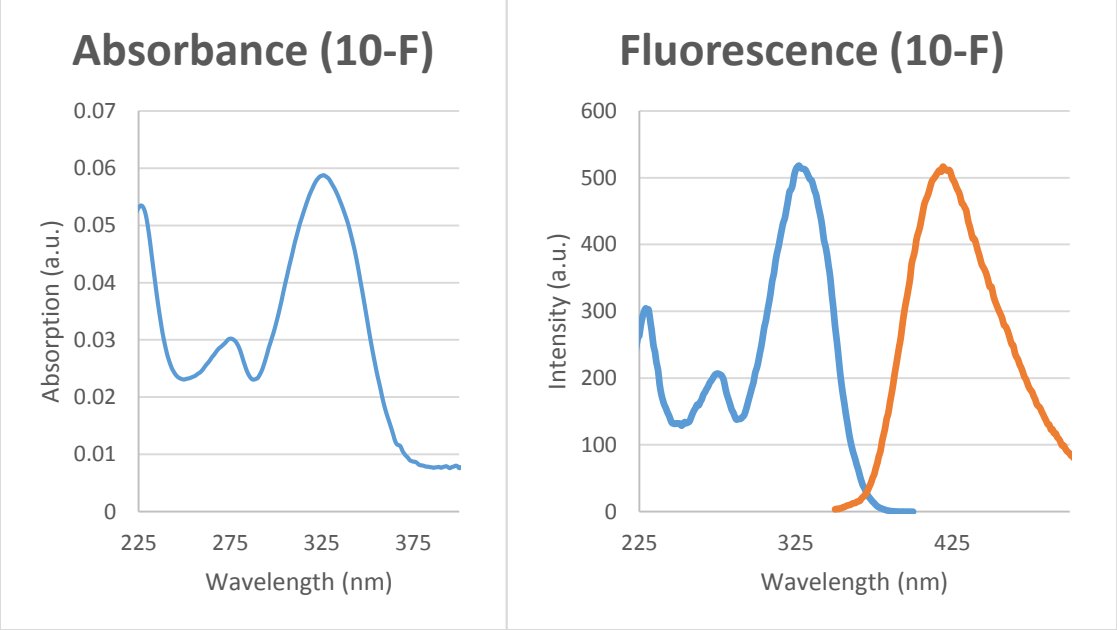


Figure S5. Absorbance spectra for **10-F** in methanol (3.39 x 10^{-6} M).

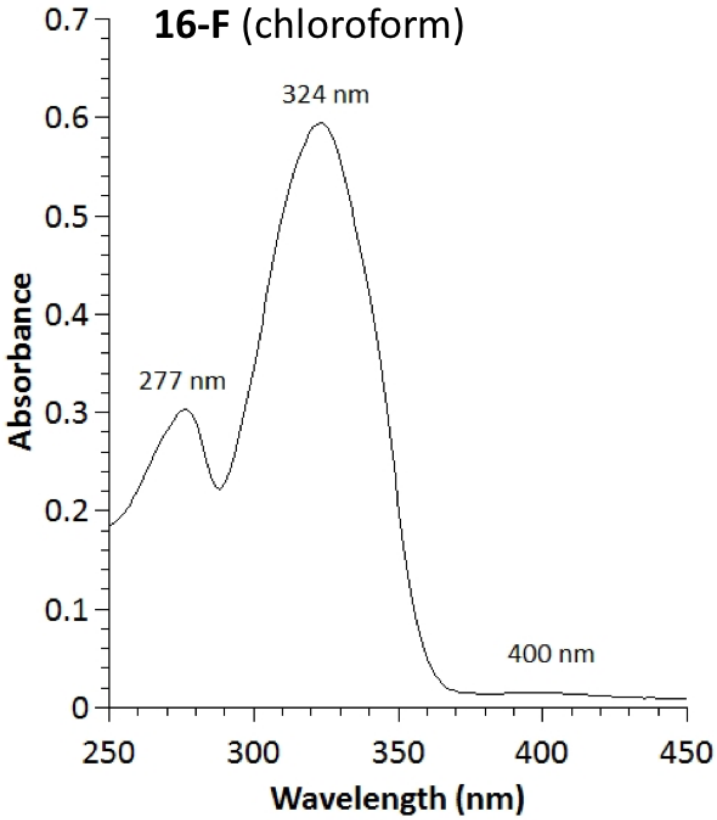


Figure S6. Absorbance spectra for **16-F** in chloroform.

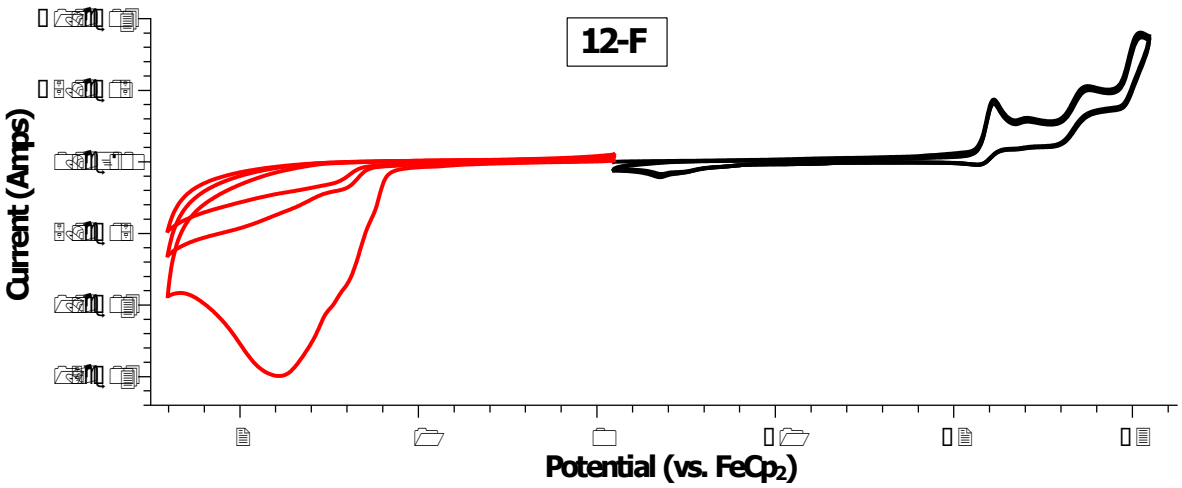


Figure S7. Overlay of oxidative and reductive cyclic voltammagrams of ~2 mM **12-F** in MeCN containing 0.1M $TBAPF_6$.

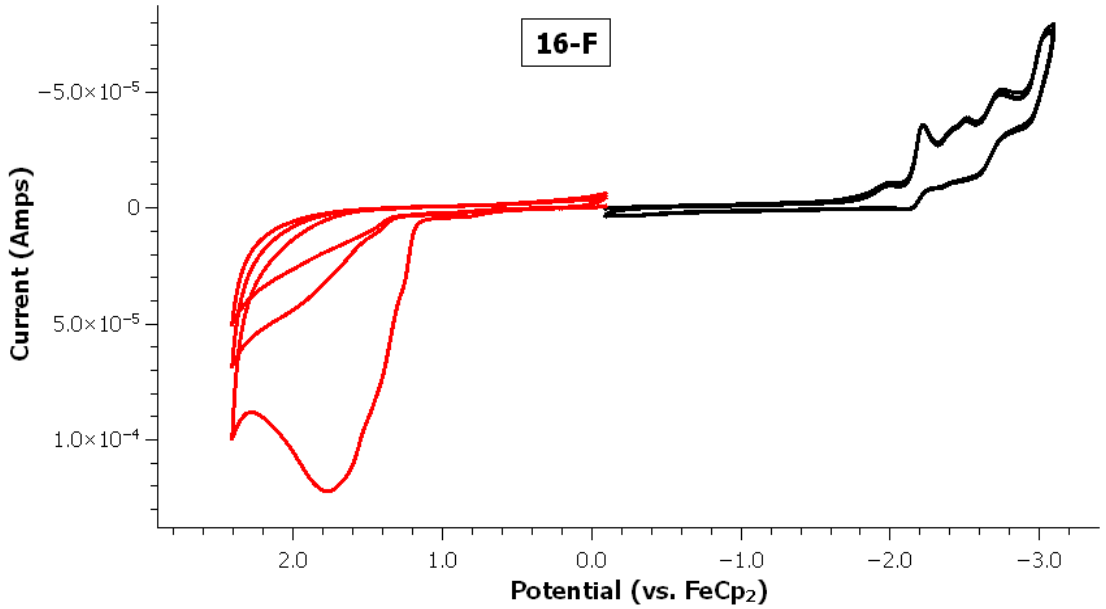
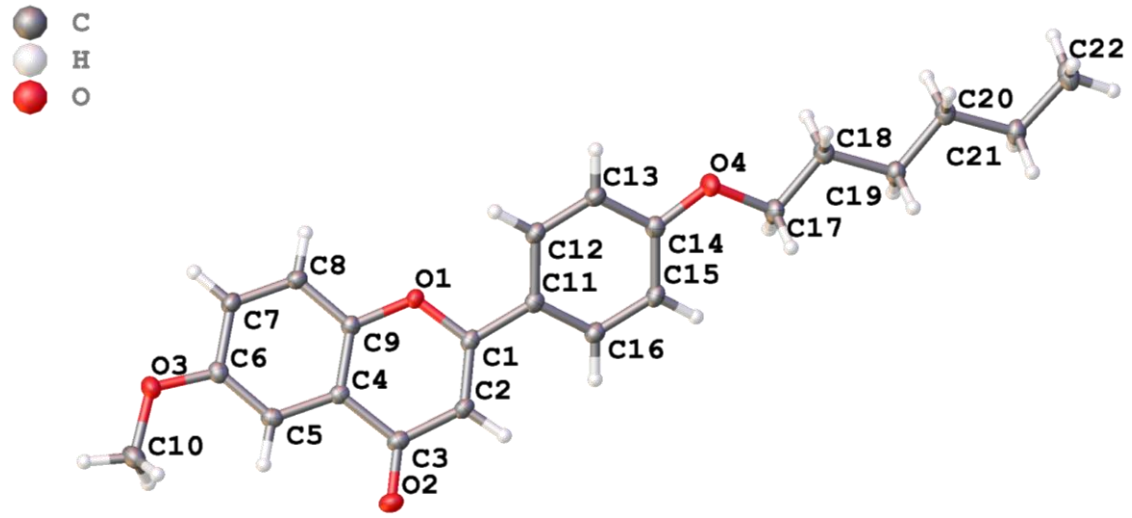


Figure S8. Overlay of oxidative and reductive cyclic voltammagrams of ~2 mM **16-F** in MeCN containing 0.1M $TBAPF_6$.

Table S1. Crystal data and structure refinement for **6-F**.

Identification code	cs1933	
Empirical formula	$C_{22}H_{24}O_4$	
Formula weight	352.41	
Temperature	100(1) K	
Wavelength	0.7107 Å	
Crystal system	monoclinic	
Space group	*P* 1 2_1/*n* 1	
Unit cell dimensions	*a* = 13.1720(8) Å	α= 90°.
	b = 8.6248(3) Å	β= 111.235(7)°.
	c = 17.2374(10) Å	γ = 90°.
Volume	1825.32(17) $Å^3$	
Z	4	
Density (calculated)	1.282 Mg/m^3	
Absorption coefficient	0.087 mm^{-1}	
F(000)	752	
Crystal size	0.572 x 0.3161 x 0.1408 mm^3	
Theta range for data collection	3.89 to 32.42°.	
Index ranges	-18<=h<=19, -11<=k<=12, -24<=l<=22	
Reflections collected	18655	
Independent reflections	6032 [R(int) = 0.0393]	
Completeness to theta = 31.00°	99.3 %	
Absorption correction	Semi-empirical from equivalents	
Max. and min. transmission	1.00000 and 0.90449	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	6032 / 0 / 237	
Goodness-of-fit on F^2	1.023	
Final R indices [I>2sigma(I)]	R1 = 0.0490, wR2 = 0.1116	
R indices (all data)	R1 = 0.0732, wR2 = 0.1268	
Largest diff. peak and hole	0.408 and -0.242 e.$Å^{-3}$	


C
H
O
C22
C20
C18
C21
C19
C17
O4
C13
C14
C12
C15
C11
C16
O1
C8
C7
C9
C1
O3
C6
C4
C2
C5
C10
C3
O2

6-F

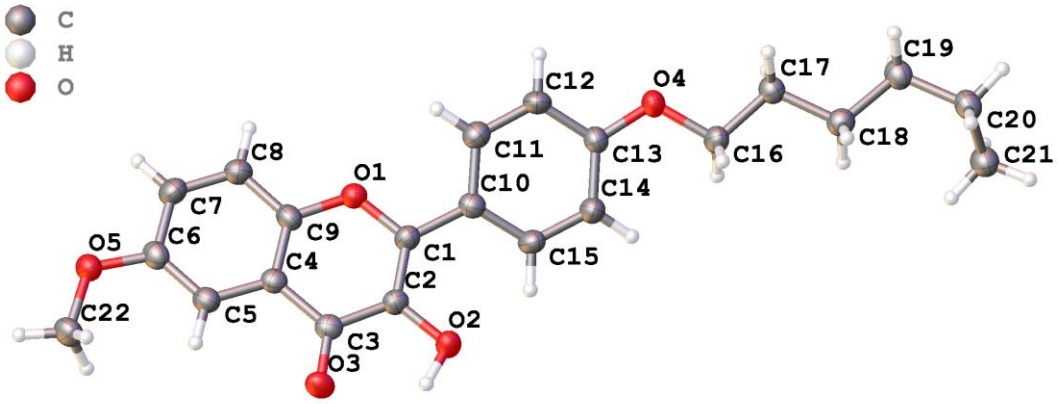
Table S2. Bond lengths [Å] and angles [°] for **6-F**.

O(1)-C(1)	1.3626(14)	C(3)-C(4)	1.4785(16)	C(13)-C(14)	1.3993(17)
O(1)-C(9)	1.3741(14)	C(4)-C(5)	1.4116(17)	C(14)-C(15)	1.3991(17)
O(2)-C(3)	1.2380(14)	C(4)-C(9)	1.3896(15)	C(15)-C(16)	1.3979(17)
O(3)-C(6)	1.3657(15)	C(5)-C(6)	1.3861(17)	C(17)-C(18)	1.5123(17)
O(3)-C(10)	1.4338(15)	C(6)-C(7)	1.4097(16)	C(18)-C(19)	1.5250(18)
O(4)-C(14)	1.3633(14)	C(7)-C(8)	1.3762(17)	C(19)-C(20)	1.5285(17)
O(4)-C(17)	1.4392(15)	C(8)-C(9)	1.3990(16)	C(20)-C(21)	1.5218(18)
C(1)-C(2)	1.3584(16)	C(11)-C(12)	1.4099(16)	C(21)-C(22)	1.5240(18)
C(1)-C(11)	1.4711(17)	C(11)-C(16)	1.3980(16)		
C(2)-C(3)	1.4474(17)	C(12)-C(13)	1.3822(17)		

C(1)-O(1)-C(9)	119.38(9)	O(1)-C(9)-C(4)	122.81(10)
C(6)-O(3)-C(10)	117.28(10)	O(1)-C(9)-C(8)	115.80(10)
C(14)-O(4)-C(17)	119.28(9)	C(4)-C(9)-C(8)	121.39(11)
O(1)-C(1)-C(11)	111.34(10)	C(12)-C(11)-C(1)	119.55(11)
C(2)-C(1)-O(1)	121.91(11)	C(16)-C(11)-C(1)	121.76(10)
C(2)-C(1)-C(11)	126.75(11)	C(16)-C(11)-C(12)	118.69(11)
C(1)-C(2)-C(3)	122.32(11)	C(13)-C(12)-C(11)	120.55(11)
O(2)-C(3)-C(2)	123.39(11)	C(12)-C(13)-C(14)	120.25(11)
O(2)-C(3)-C(4)	122.02(11)	O(4)-C(14)-C(13)	114.44(10)
C(2)-C(3)-C(4)	114.59(10)	O(4)-C(14)-C(15)	125.41(11)
C(5)-C(4)-C(3)	121.61(10)	C(15)-C(14)-C(13)	120.16(11)
C(9)-C(4)-C(3)	118.93(11)	C(16)-C(15)-C(14)	119.18(11)
C(9)-C(4)-C(5)	119.46(11)	C(15)-C(16)-C(11)	121.17(11)
C(6)-C(5)-C(4)	119.28(11)	O(4)-C(17)-C(18)	106.37(10)
O(3)-C(6)-C(5)	125.75(11)	C(17)-C(18)-C(19)	112.79(10)
O(3)-C(6)-C(7)	114.07(11)	C(18)-C(19)-C(20)	112.74(10)
C(5)-C(6)-C(7)	120.17(11)	C(21)-C(20)-C(19)	113.07(10)
C(8)-C(7)-C(6)	120.89(11)	C(20)-C(21)-C(22)	113.26(11)
C(7)-C(8)-C(9)	118.75(11)		

Table S3. Crystal data and structure refinement for **6-F-OH**.

Identification code	DT270b	
Empirical formula	$C_{22}H_{24}O_5$	
Formula weight	368.41	
Temperature	100.00(10) K	
Wavelength	1.5418 Å	
Crystal system	triclinic	
Space group	*P* -1	
Unit cell dimensions	*a* = 7.5634(7) Å	α= 89.108(7)°.
	b = 10.1766(9) Å	β= 86.251(7)°.
	c = 12.0988(9) Å	γ = 81.306(8)°.
Volume	918.55(14) $Å^3$	
Z	2	
Density (calculated)	1.332 Mg/m^3	
Absorption coefficient	0.765 mm^{-1}	
F(000)	392	
Crystal size	0.1268 x 0.0581 x 0.0167 mm^3	
Theta range for data collection	3.66 to 72.63°.	
Index ranges	-8<=h<=9, -12<=k<=12, -14<=l<=13	
Reflections collected	10503	
Independent reflections	3559 [R(int) = 0.0677]	
Completeness to theta = 67.50°	99.5 %	
Absorption correction	Gaussian	
Max. and min. transmission	1.047 and 0.953	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	3559 / 0 / 249	
Goodness-of-fit on F^2	1.019	
Final R indices [I>2sigma(I)]	R1 = 0.0686, wR2 = 0.1598	
R indices (all data)	R1 = 0.1243, wR2 = 0.1948	
Largest diff. peak and hole	0.275 and -0.296 $e.Å^{-3}$	


C
H
O
C8
O1
C12
O4
C17
C19
C11
C13
C16
C18
C20
C21
C10
C14
C7
C6
C9
O5
C4
C1
C15
C2
C22
C5
O2
C3
O3

6-F-OH

Table S4. Bond lengths [Å] and angles [°] for **6-F-OH**.

O(1)-C(1)	1.378(4)	C(2)-C(3)	1.437(4)	C(11)-C(12)	1.382(5)
O(1)-C(9)	1.369(4)	C(3)-C(4)	1.454(5)	C(12)-C(13)	1.401(5)
O(2)-C(2)	1.366(4)	C(4)-C(5)	1.408(4)	C(13)-C(14)	1.400(5)
O(3)-C(3)	1.251(4)	C(4)-C(9)	1.384(5)	C(14)-C(15)	1.373(4)
O(4)-C(13)	1.357(4)	C(5)-C(6)	1.384(5)	C(16)-C(17)	1.500(4)
O(4)-C(16)	1.443(4)	C(6)-C(7)	1.405(5)	C(17)-C(18)	1.521(4)
O(5)-C(6)	1.362(4)	C(7)-C(8)	1.366(5)	C(18)-C(19)	1.526(4)
O(5)-C(22)	1.441(4)	C(8)-C(9)	1.399(5)	C(19)-C(20)	1.528(5)
C(1)-C(2)	1.367(5)	C(10)-C(11)	1.399(5)	C(20)-C(21)	1.520(5)
C(1)-C(10)	1.460(4)	C(10)-C(15)	1.404(5)		

C(9)-O(1)-C(1)	120.5(3)	C(7)-C(8)-C(9)	118.5(3)
C(13)-O(4)-C(16)	117.4(3)	O(1)-C(9)-C(4)	122.4(3)
C(6)-O(5)-C(22)	117.3(3)	O(1)-C(9)-C(8)	116.4(3)
O(1)-C(1)-C(10)	112.1(3)	C(4)-C(9)-C(8)	121.2(3)
C(2)-C(1)-O(1)	119.9(3)	C(11)-C(10)-C(1)	119.7(3)
C(2)-C(1)-C(10)	127.9(3)	C(11)-C(10)-C(15)	117.6(3)
O(2)-C(2)-C(1)	119.9(3)	C(15)-C(10)-C(1)	122.6(3)
O(2)-C(2)-C(3)	117.9(3)	C(12)-C(11)-C(10)	121.3(3)
C(1)-C(2)-C(3)	122.3(3)	C(11)-C(12)-C(13)	120.1(3)
O(3)-C(3)-C(2)	120.8(3)	O(4)-C(13)-C(12)	115.8(3)
O(3)-C(3)-C(4)	123.2(3)	O(4)-C(13)-C(14)	124.8(3)
C(2)-C(3)-C(4)	116.1(3)	C(14)-C(13)-C(12)	119.3(3)
C(5)-C(4)-C(3)	121.3(3)	C(15)-C(14)-C(13)	119.8(3)
C(9)-C(4)-C(3)	118.8(3)	C(14)-C(15)-C(10)	121.8(3)
C(9)-C(4)-C(5)	119.9(3)	O(4)-C(16)-C(17)	107.8(3)
C(6)-C(5)-C(4)	119.0(3)	C(16)-C(17)-C(18)	111.8(3)
O(5)-C(6)-C(5)	125.2(3)	C(17)-C(18)-C(19)	113.0(3)
O(5)-C(6)-C(7)	115.0(3)	C(18)-C(19)-C(20)	113.3(3)
C(5)-C(6)-C(7)	119.8(3)	C(21)-C(20)-C(19)	113.5(3)
C(8)-C(7)-C(6)	121.6(3)		

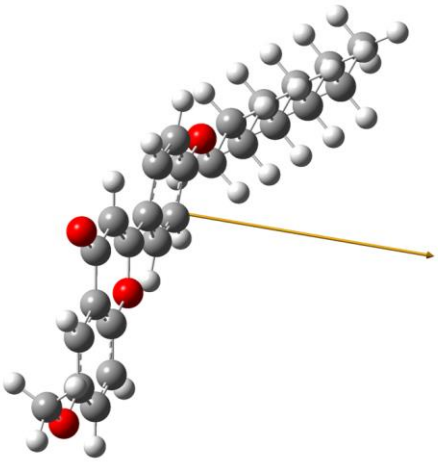
DFT Calculations were performed with Gaussian 09[19] and GaussView 5[20] was used to visualize the structures. All atoms were optimized and checked for imaginary frequencies using the 6-31(g) basis set on all atoms.

	Zero Point Energy Corrected Energy (au)	Number of Imaginary Frequencies	Dipole Moment (Debye)
Flavone	-1310.127989	0	5.1126
Isoflavone	-1310.121466	0	3.0844

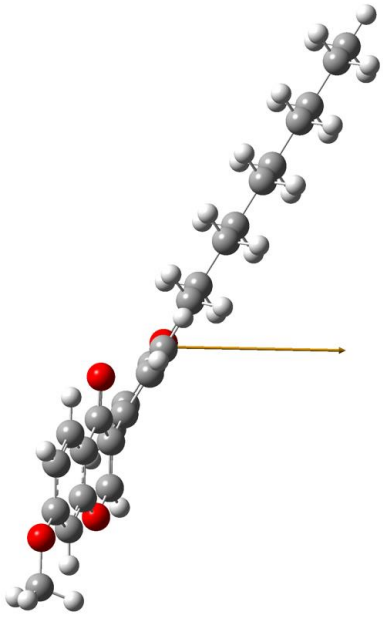
Flavone	Exact	polarizability:	515.811	-13.624	281.75	1.408	-0.756	149.861
	Approx	polarizability:	615.468	20.58	490.385	3.965	0.033	219.676

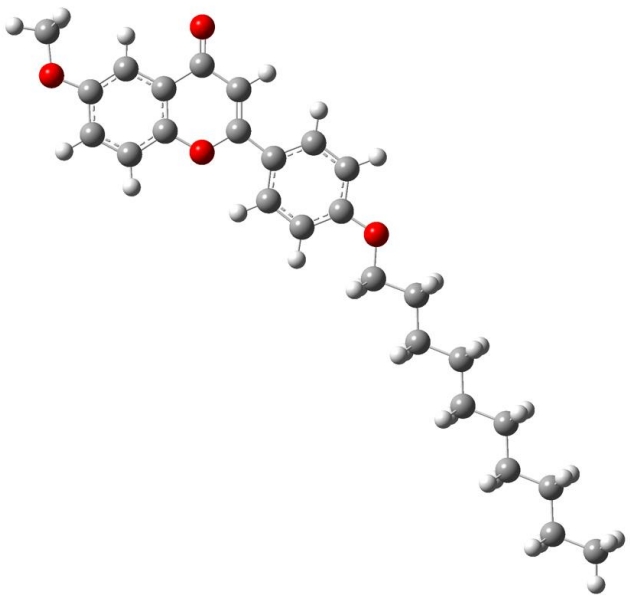
Isoflavone	Exact	polarizability:	501.089	-4.816	256.368	-13.057	-5.613	161.84
	Approx	polarizability:	578.208	19.009	457.357	-27.93	-21.371	245.113

Dipole vector for Flavone:



Dipole vector for Isoflavone:





Flavone Coordinates:

TITLE	Flavone						
REMARK	1	File	created	by	GaussView	5.0.9	
HETATM	1	C	0	6.067	-2.243	-0.079	C
HETATM	2	C	0	5.76	-0.877	-0.028	C
HETATM	3	C	0	6.764	0.096	0.021	C
HETATM	4	C	0	8.112	-0.308	0.019	C
HETATM	5	C	0	8.426	-1.663	-0.032	C
HETATM	6	C	0	7.399	-2.632	-0.081	C
HETATM	7	H	0	5.265	-2.97	-0.117	H
HETATM	8	H	0	8.861	0.473	0.058	H
HETATM	9	H	0	7.68	-3.677	-0.121	H
HETATM	10	C	0	6.398	1.526	0.077	C
HETATM	11	O	0	7.268	2.436	0.127	O
HETATM	12	C	0	4.972	1.794	0.074	C
HETATM	13	H	0	4.677	2.832	0.13	H
HETATM	14	C	0	4.029	0.81	0.016	C
HETATM	15	O	0	4.407	-0.529	-0.031	O
HETATM	16	C	0	2.572	0.975	-0.002	C
HETATM	17	C	0	1.722	-0.141	0.105	C
HETATM	18	C	0	1.981	2.253	-0.126	C
HETATM	19	C	0	0.333	0.001	0.093	C

HETATM	20	H	0	2.156	-1.128	0.199	H
HETATM	21	C	0	0.602	2.405	-0.14	C
HETATM	22	H	0	2.603	3.135	-0.226	H
HETATM	23	C	0	-0.233	1.278	-0.03	C
HETATM	24	H	0	-0.29	-0.88	0.18	H
HETATM	25	H	0	0.142	3.381	-0.239	H
HETATM	26	O	0	-1.592	1.535	-0.058	O
HETATM	27	C	0	-2.541	0.425	0.048	C
HETATM	28	H	0	-2.39	-0.093	1.004	H
HETATM	29	H	0	-2.36	-0.288	-0.768	H
HETATM	30	C	0	-3.939	1.022	-0.044	C
HETATM	31	H	0	-4.032	1.555	-0.999	H
HETATM	32	H	0	-4.054	1.771	0.75	H
HETATM	33	C	0	-5.04	-0.048	0.075	C
HETATM	34	H	0	-4.944	-0.57	1.039	H
HETATM	35	H	0	-4.899	-0.811	-0.706	H
HETATM	36	C	0	-6.46	0.537	-0.045	C
HETATM	37	H	0	-6.559	1.051	-1.013	H
HETATM	38	H	0	-6.601	1.307	0.729	H
HETATM	39	C	0	-7.568	-0.523	0.084	C
HETATM	40	H	0	-7.419	-1.299	-0.682	H
HETATM	41	H	0	-7.474	-1.03	1.057	H
HETATM	42	C	0	-8.987	0.057	-0.051	C
HETATM	43	H	0	-9.136	0.836	0.712	H
HETATM	44	H	0	-9.082	0.559	-1.026	H
HETATM	45	O	0	9.717	-2.174	-0.04	O
HETATM	46	C	0	10.83	-1.24	0.005	C
HETATM	47	H	0	11.724	-1.862	-0.013	H
HETATM	48	H	0	10.821	-0.573	-0.865	H
HETATM	49	H	0	10.808	-0.643	0.924	H
HETATM	50	C	0	-10.096	-1.003	0.083	C
HETATM	51	H	0	-9.944	-1.785	-0.677	H
HETATM	52	H	0	-10.004	-1.502	1.06	H
HETATM	53	C	0	-11.516	-0.426	-0.06	C
HETATM	54	H	0	-11.669	0.357	0.699	H
HETATM	55	H	0	-11.609	0.072	-1.037	H
HETATM	56	C	0	-12.625	-1.485	0.075	C
HETATM	57	H	0	-12.472	-2.267	-0.683	H
HETATM	58	H	0	-12.532	-1.983	1.052	H
HETATM	59	C	0	-14.039	-0.9	-0.07	C

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HETATM   60  H           0     -14.806      -1.677       0.027  H
HETATM   61  H           0     -14.232      -0.141       0.698  H
HETATM   62  H           0     -14.169      -0.422      -1.049  H
END
CONECT    1    2    6    7
CONECT    2    1    3   15
CONECT    3    2    4   10
CONECT    4    3    5    8
CONECT    5    4    6   45
CONECT    6    1    5    9
CONECT    7    1
CONECT    8    4
CONECT    9    6
CONECT   10    3   11   12
CONECT   11   10
CONECT   12   10   13   14
CONECT   13   12
CONECT   14   12   15   16
CONECT   15    2   14
CONECT   16   14   17   18
CONECT   17   16   19   20
CONECT   18   16   21   22
CONECT   19   17   23   24
CONECT   20   17
CONECT   21   18   23   25
CONECT   22   18
CONECT   23   19   21   26
CONECT   24   19
CONECT   25   21
CONECT   26   23   27
CONECT   27   26   28   29   30
CONECT   28   27
CONECT   29   27
CONECT   30   27   31   32   33
CONECT   31   30
CONECT   32   30
CONECT   33   30   34   35   36
CONECT   34   33
CONECT   35   33
CONECT   36   33   37   38   39
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CONECT   37   36
CONECT   38   36
CONECT   39   36   40   41   42
CONECT   40   39
CONECT   41   39
CONECT   42   39   43   44   50
CONECT   43   42
CONECT   44   42
CONECT   45    5   46
CONECT   46   45   47   48   49
CONECT   47   46
CONECT   48   46
CONECT   49   46
CONECT   50   42   51   52   53
CONECT   51   50
CONECT   52   50
CONECT   53   50   54   55   56
CONECT   54   53
CONECT   55   53
CONECT   56   53   57   58   59
CONECT   57   56
CONECT   58   56
CONECT   59   56   60   61   62
CONECT   60   59
CONECT   61   59
CONECT   62   59
```

Isoflavone Coordinates:

TITLE	Isoflavone						
REMARK	1	File	created	by	GaussView	5.0.9	
HETATM	1	C	0	-8.253	-0.352	0.365	C
HETATM	2	C	0	-6.86	-0.313	0.248	C
HETATM	3	C	0	-6.159	0.837	-0.139	C
HETATM	4	C	0	-6.915	1.998	-0.421	C
HETATM	5	C	0	-8.293	1.993	-0.316	C
HETATM	6	C	0	-8.966	0.812	0.079	C
HETATM	7	H	0	-8.725	-1.275	0.671	H
HETATM	8	H	0	-6.374	2.888	-0.72	H
HETATM	9	C	0	-4.693	0.835	-0.248	C
HETATM	10	O	0	-4.06	1.876	-0.564	O
HETATM	11	C	0	-4.031	-0.457	0.04	C
HETATM	12	C	0	-4.799	-1.507	0.439	C
HETATM	13	O	0	-6.176	-1.489	0.548	O
HETATM	14	C	0	-2.565	-0.631	-0.095	C
HETATM	15	C	0	-2.028	-1.862	-0.535	C
HETATM	16	C	0	-1.664	0.401	0.226	C
HETATM	17	C	0	-0.655	-2.064	-0.621	C
HETATM	18	H	0	-2.696	-2.661	-0.84	H

HETATM	19	C	0	-0.281	0.209	0.138	C
HETATM	20	H	0	-2.048	1.365	0.529	H
HETATM	21	C	0	0.227	-1.028	-0.278	C
HETATM	22	H	0	-0.242	-3.005	-0.965	H
HETATM	23	H	0	0.381	1.027	0.394	H
HETATM	24	O	0	1.58	-1.323	-0.396	O
HETATM	25	O	0	-10.342	0.915	0.155	O
HETATM	26	C	0	-11.115	-0.25	0.557	C
HETATM	27	H	0	-12.153	0.08	0.544	H
HETATM	28	H	0	-10.979	-1.076	-0.15	H
HETATM	29	H	0	-10.84	-0.576	1.566	H
HETATM	30	H	0	-4.415	-2.475	0.726	H
HETATM	31	H	0	-8.887	2.873	-0.529	H
HETATM	32	C	0	2.567	-0.296	-0.078	C
HETATM	33	H	0	2.42	0.571	-0.736	H
HETATM	34	H	0	2.434	0.033	0.963	H
HETATM	35	C	0	3.943	-0.917	-0.283	C
HETATM	36	H	0	4.017	-1.273	-1.319	H
HETATM	37	H	0	4.03	-1.8	0.363	H
HETATM	38	C	0	5.084	0.073	0.018	C
HETATM	39	H	0	4.988	0.443	1.05	H
HETATM	40	H	0	4.99	0.954	-0.636	H
HETATM	41	C	0	6.481	-0.547	-0.167	C
HETATM	42	H	0	6.578	-0.921	-1.198	H
HETATM	43	H	0	6.577	-1.425	0.49	H
HETATM	44	C	0	7.627	0.437	0.127	C
HETATM	45	H	0	7.524	0.818	1.155	H
HETATM	46	H	0	7.534	1.312	-0.535	H
HETATM	47	C	0	9.025	-0.183	-0.046	C
HETATM	48	H	0	9.128	-0.566	-1.073	H
HETATM	49	H	0	9.119	-1.056	0.618	H
HETATM	50	C	0	10.172	0.802	0.246	C
HETATM	51	H	0	10.08	1.673	-0.42	H
HETATM	52	H	0	10.067	1.187	1.272	H
HETATM	53	C	0	11.571	0.181	0.079	C
HETATM	54	H	0	11.664	-0.69	0.746	H
HETATM	55	H	0	11.677	-0.205	-0.946	H
HETATM	56	C	0	12.718	1.166	0.37	C
HETATM	57	H	0	12.624	2.036	-0.297	H
HETATM	58	H	0	12.61	1.553	1.394	H
HETATM	59	C	0	14.11	0.537	0.203	C
HETATM	60	H	0	14.905	1.261	0.418	H
HETATM	61	H	0	14.241	-0.315	0.881	H

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HETATM   62  H                0      14.257       0.172      -0.821  H
END
CONECT    1    2    6    7
CONECT    2    1    3   13
CONECT    3    2    4    9
CONECT    4    3    5    8
CONECT    5    4    6   31
CONECT    6    1    5   25
CONECT    7    1
CONECT    8    4
CONECT    9    3   10   11
CONECT   10    9
CONECT   11    9   12   14
CONECT   12   11   13   30
CONECT   13    2   12
CONECT   14   11   15   16
CONECT   15   14   17   18
CONECT   16   14   19   20
CONECT   17   15   21   22
CONECT   18   15
CONECT   19   16   21   23
CONECT   20   16
CONECT   21   17   19   24
CONECT   22   17
CONECT   23   19
CONECT   24   21   32
CONECT   25    6   26
CONECT   26   25   27   28   29
CONECT   27   26
CONECT   28   26
CONECT   29   26
CONECT   30   12
CONECT   31    5
CONECT   32   24   33   34   35
CONECT   33   32
CONECT   34   32
CONECT   35   32   36   37   38
CONECT   36   35
CONECT   37   35
CONECT   38   35   39   40   41
CONECT   39   38
CONECT   40   38
CONECT   41   38   42   43   44
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CONECT	42	41			
CONECT	43	41			
CONECT	44	41	45	46	47
CONECT	45	44			
CONECT	46	44			
CONECT	47	44	48	49	50
CONECT	48	47			
CONECT	49	47			
CONECT	50	47	51	52	53
CONECT	51	50			
CONECT	52	50			
CONECT	53	50	54	55	56
CONECT	54	53			
CONECT	55	53			
CONECT	56	53	57	58	59
CONECT	57	56			
CONECT	58	56			
CONECT	59	56	60	61	62
CONECT	60	59			
CONECT	61	59			
CONECT	62	59			